Community Food Systems: Working towards Sustainability and Satisfying Human Needs

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Abstract:
A community food system (CFS) can assist a community in satisfying human needs while also working toward a principle-based understanding of sustainability. Utilizing a whole-systems perspective and the Framework for Strategic Sustainable Development, we identify generic satisfiers of human needs (as defined by Max-Neef: Subsistence, Participation, Identity, Idleness, Creation, Freedom, Affection, Understanding and Protection) that are affected by a CFS. Then we identify specific leverage points within the community food system that most enhance those generic satisfiers. By implementing strategies developed around those leverage points, a community food system will provide opportunities to meet Human Needs and help a community move toward sustainability. In doing so, the CFS can have a significant “ripple effect” within the community, and on into society, that serves to support movement towards a sustainable future.

Keywords:
Food system, human needs, community, sustainability, strategic sustainable development, systems thinking
Statement of Contribution

June 2, 2007

Through an interest in food this group came together to explore the creation of sustainable community food systems.

Due to the primary research method—systems analysis—our work was a truly collaborative effort from start to finish. Through the process our individual strengths emerged as we would diverge and converge from understanding, perspective, and agreement. The work you are about to read is a result of our equal and passionate collaboration.

Monique introduced us to systems thinking ‘biased with optimism.’ Her research skills, analytical capacity, and ability and ambition to get things done have all contributed immensely to the completion of this project.

Katie’s passion for practical simplicity kept us on track. She focused our efforts on building upon areas of consensus while tenderly navigating others, allowing us to co-create a document out of our collective strengths.

Tony brought a ‘healthy dose of reality,’ attention to detail balanced with an understanding of the whole, and a thorough understanding of sustainability as viewed through the Framework for Strategic Sustainable Development.

Through this collaborative process we often struggled for understanding (of ourselves, each other, and the system in focus) and yet have come away with increased clarity. The lessons we have learned will help with endeavors where we seek to listen, understand, and then transform our future into a sustainable one.

The Food Group,

Monique Monteverde  Katie Pease  Anthony W. Thompson
Acknowledgements

This work was carried out at the Department of Mechanical Engineering at Blekinge Institute of Technology in Karlskrona, Sweden, under the supervision of Richard Blume. His words of encouragement and positive direction were crucial in helping us pull this project together.

A special thanks to David Waldron, Henrik Ny, and John Craig: we appreciate the time they so graciously shared with us. Their expertise has significantly contributed to our success with this project.

We would also like to thank our supervisors and classmates in the Strategic Leadership towards Sustainability Programme for their insight, encouragement and friendship throughout the year.

Finally, we are very grateful to all of those who have supported and inspired us – from those in the field doing good work to promote healthy food choices to our family and friends around the world. Thank you!

Community Food Systems are vitally important on the journey to a more sustainable future. A CFS’s fingers stretch into nearly all reaches of a community, and as such, the CFS can be a major lever in moving us forward. We hope that this document inspires you to stretch your vision of what is possible—to further imagine not only a flourishing community food system, but also one that aspires to satisfy human needs. Further, we hope that the strategy areas we have outlined will complement the work of other communities and help them create synergies in planning strategically for a community vision.

We welcome your comments, questions, and suggestions regarding our research.

Sincerely,

Monique, Katie, and Tony

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Executive Summary

Introduction
This study is intended to help individuals understand the significance of a community food system (CFS) in working towards satisfying human needs and complying with principles for socio-ecological sustainability. The Brundtland definition for sustainability (see diagram below) outlines a value-based vision to work towards when aiming for a sustainable future. This definition conveys the understanding that actions taken today impact tomorrow’s generations. For the possibility of needs to be met now and into the future, ecological and social systems must not be systematically degraded.

[Diagram of Brundtland Definition of Sustainable Development]

*Brundtland Definition of Sustainable Development.*

The circle at the top is a value statement to define the term “sustainable development.” The two circles below represent a scientific, non-value based method to achieve “sustainability.”

Sustainability Principles “SP” are defined below.

Few approaches to sustainable development are guided by a shared understanding of principles that define the end goal for success. Four principles for socio-ecological sustainability have been identified through a process of scientific consensus and peer-review (Holmberg et al. 1996; Ny et al. 2006, 64). The constraints of these principles define an end-goal for sustainability and they will be used throughout this paper to define socio-ecological sustainability in the biosphere. The first three sustainability principles (SP) pertain to what must not be done in order to not destroy the
ecological system and the fourth system condition refers to not undermining the capacity of the social system.

Utilizing a definition of human needs put forth by the Chilean economist Manfred Max-Neef (1991), we have laid out a clear understanding of what human needs are and how they are satisfied and deprived. Max-Neef’s classification of Human Needs\(^1\) is particularly useful as it has been developed for use across cultures and time, and recognizes that ways in which needs are satisfied varies by culture. According to Max-Neef, basic Human Needs include subsistence, freedom, affection, creation, participation, understanding, identity, idleness, and protection.

Food extends beyond merely meeting the human need for subsistence and offers possibilities for people to realize many additional Human Needs. However, most food in North America is produced and sold through a global food commodity system (GFCS) that is driven by fierce market pressure and puts economic gain at the forefront. This has created trends that contribute to the decreasing health of ecological and social systems. As human and ecosystem health declines, the web of community resilience also declines.

Today, many municipal charters reflect the intention of communities to meet Human Needs and to be environmentally sustainable. Due to the ecologically and socially destructive nature of the GFCS, there is a need to develop the food system with a focus on more than its economic viability. Working toward sustainability and the meeting of Human Needs (in order to enhance the health of people and the communities in which they live) does exactly that. Community food systems (CFS) are a great means for incorporating the environmental and social aspects that are overlooked in the GFCS.

"A ‘community food system’ is one in which sustainable food production, processing, distribution and consumption are integrated to enhance the environmental, economic, social and nutritional health of a particular place" (Feenstra and Garrett 1999, 2).

\(^1\) Human Needs refers to the nine fundamental human needs defined by Max-Neef (1991).
A five-level framework for planning in complex systems can be used to strategically plan for sustainable development of society in the biosphere (described in Robèrt et al. 2002; Robèrt 2000).

The system of focus for this study was the community food system. In order to reach success we worked within the constraints of the sustainability principles to provide opportunities to meet Human Needs and laid out a vision to work towards which reflects this desire:

*Through the creation of a vibrant community food system designed in compliance with sustainability principles and focused on satisfying Human Needs, we will restore and enhance ecological and social systems.*

We then developed strategy areas to guide communities in the process of developing a CFS to work toward success as defined above.

**System of Focus:**

*Community Food System within Community within Society within the Biosphere*

**Methods and Results**

We completed a *Human Needs* assessment using Max-Neef’s *Human Needs*. Nine causal loop diagrams (CLD) were created, each diagram to answer the question: How can a community food system satisfy this (one of the nine) *Human Need*? These CLDs enabled the development of strategies related to those satisfiers vis-à-vis “leverage points” within an envisioned sustainable community food system.
Our results show how the development of community food systems can lead communities towards the satisfaction of *Human Needs* and sustainability (developing a CFS with an approach that incorporates backcasting from sustainability principles will work towards meeting *Human Needs* now and into the future). We were able to determine leverage points a CFS can use to create opportunities to satisfy *Human Needs*. Using our systems analysis, a community strategy analysis, and the FSSD, we developed strategy areas to guide communities in the process of creating or strengthening a community food system that works toward sustainability and the satisfaction of *Human Needs*. Those strategy areas are:

- Access & Availability of Healthy Foods
- Food Education
- Food Gathering Places
- Community Food Growing Places
- Local Food Production
- Local Food Markets
- Food Policy
- Celebration of Local Food

A description of each strategy area coupled with possible actions is provided in the full text of this research paper.

**Discussion**

The eight strategy areas that we have outlined share some important commonalities, such as the building of personal relationships within the community through collaboration, communication, and appreciation. *Celebrations of local food* bring people together. Developing a local food system through *local food production*, processing, and *local food markets* requires cooperation among community members and businesses (Feenstra 1997, 6). Incorporating nutritious foods into community members’ diets can unite educational and food marketing initiatives. In each situation, a diverse group of stakeholders is formed. Networks are built and new friendships develop to strengthen the social fabric of the community.

Developing community food systems is an effective strategy for communities to solve many of the problems created by the GFCS. Building the capacity of the community to provide food for its residents builds sovereignty and creates redundancies within the greater food system.
(Vergunst 2001, 2). Internalizing the food system to address its environmental and social costs helps avoid ecological pitfalls and social inequities, while simultaneously providing opportunities for the economy to grow within the community.

If a CFS is to work towards the realization of all nine Human Needs, then it must simultaneously work towards compliance with the sustainability principles. It is not enough to satisfy the needs of today; communities must also keep in mind future generations that will demand access to resources. Society will always use resources from the environment for sustenance. However, this can be done in a way that maintains the health of our environment so that it can continue to support our communities in perpetuity.

The CFS encourages cooperation that can strengthen connections between all community sub-systems creating a ripple effect. This ripple can be expanded out to the macro scale and we use the same argument to discuss the potential for communities using the FSSD to have an increased influence that ripples out towards other communities, eventually affecting all of society.

**Conclusion**
There is an increasing need for communities to begin growing community food systems to support the health of the social and ecological aspects on which they depend. Developing a community food system that provides opportunities to meet Human Needs can be used as a leverage point in moving communities towards socio-ecological sustainability. Using a principle-based definition of sustainability, this thesis has explored ways in which such a CFS could be developed. Working within the constraints of the Sustainability Principles provides clear boundaries to guide the planning process. However, in order to best engage individuals within a community, it is important to create an optimistic and compelling vision that seeks to achieve a higher level of success.
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List of Abbreviations

5LF: Five-Level Framework
BSP: Backcasting from Sustainability Principles
CFS: Community Food System
CLD: Causal Loop Diagram
CSA: Community-Supported Agriculture
FSSD: Framework for Strategic Sustainable Development
GFCS: Global Food Commodity System
HN: Human Needs
NGO: Non-Governmental Organization
SP: Sustainability Principles
TNS: The Natural Step
SSD: Strategic Sustainable Development
Glossary

**ABCD Methodology:**
A tool for applying *backcasting from sustainability principles* to a planning endeavor. It includes: A) understanding the system creating shared mental models B) assessing sustainability performance today C) establishing a vision of success and brainstorming solutions and D) prioritizing strategic actions (Robèrt, 2000).

**Backcasting:**
A strategy that envisions a desired future, then looks back to today’s position from that imagined future, and considers how to strategically move from the current position to the desired future position.

**Causal Loop Diagram (CLD):**
A Causal loop diagram maps out the structure and the feedbacks of a system in order to understand its feedback mechanisms. CLDs are used to understand how a behavior has been manifesting itself in a system so we can develop strategies to work with or counteract the behavior (Haraldsson 2004, 20).

**Community Food System:**
A “community food system” is one in which sustainable food production, processing, distribution and consumption are integrated to enhance the environmental, economic, and social and nutritional health of a particular place” (Feenstra and Garrett 1999, 2)

**Community Supported Agriculture (CSA):**
Community supported agriculture is model promoting direct connection between a farm or group of farmers and supporters existing within a community. This is usually done through mutual commitment where community members agree in advance to purchase a certain amount of product from the farmers throughout their growing season.

**Global Food Commodity System:**
Characterized by a capitalistic global trade market which advocates production of food on large scale mono-culture farms in their respective bio-regions and shipping these ‘commodities’ around the world.
Human Needs:

Slow Food:
Defined as good, clean and fair food, slow foods should taste good; be produced in a clean way that does not harm the environment, animal welfare or our health; and producers should receive fair compensation for their work.

Slow Food Movement:
Founded upon the concept of eco-gastronomy, it places recognition on the strong connections between plate and planet, and the belief that everyone has a fundamental right to pleasure and consequently the responsibility to protect the heritage of food, tradition and culture that make this pleasure possible.

Strategic Sustainable Development:
In this context, refers to a ‘backcasting from sustainability principles’ approach to sustainable development whereby a vision of a sustainable future is set as the reference point for developing strategic actions. The Sustainability Principles are used to define the minimum requirements of a sustainable society.

Sustainability Principles:
Refer to basic principles for socio-ecological sustainability derived by scientific consensus to define the minimum requirements of a sustainable society. The principles are derived from basic laws of science and have been published and peer-reviewed by the international scientific community and promoted by The Natural Step.

Systems Analysis:
Systems analysis is about discovering organisational structures in systems and creating insights into the organisation of causalities. (See also “systems thinking.”) (Haraldsson 2004, 5).
Systems Thinking:
A science that deals with the organization of logic and integration of disciplines for understanding patterns and relations of complex problems. It is based on understanding connections and relations between seemingly isolated things (Haraldsson 2004, 4).

The Natural Step:
An international non-governmental organization (NGO) of Swedish origin which developed and promotes The Natural Step Framework for strategic planning towards sustainability.

The Natural Step Framework:
Refers to basic principles for socio-ecological sustainability to define the minimum requirements of a sustainable society. The conditions are derived from basic laws of science and have been published and peer-reviewed by the international scientific community.
1 Introduction

There is a crucial need today for compelling images of a future we truly want to create: an economic system that operates in accord with natural principles and generates no waste, an energy system powered entirely by net energy from the sun, [a regenerative food system that provides nourishment to all individuals], and an ethic of being common villagers who must all live together on an increasingly interdependent planet ... this means moving from a compliance mentality of doing no harm to the aggressive creation of products, processes and companies that are truly creating restorative and enduring wealth – leaving communities and larger living systems in better condition, not worse. (Senge et al. 2006, 8)

The potential to socially and ecologically revitalize communities can increase hope for the future and the possibility of survival for generations to come. One aspect of this potential is explored in this thesis: sustainable community food systems developed with the intent of providing opportunities to meet human needs.

1.1 The Global Food Commodity System

Most food in North America today is produced and sold through a global food commodity system (GFCS). The term “global” refers to the fact that food security is approached at the global level, where all parts of the world are considered highly dependent on each other. Raw materials and products flow through the GFCS one way while money flows in the other. This flow is characterized by a small number of large, vertically integrated multinational companies that seek control over production, market share and profits on a global basis (Vergunst 2001, 4). Only a small amount of the money that flows through them returns to the farmer and/or the community in which the farmer resides (US Food System Factsheet, 2005), resulting in a system that is more linear than cyclical.
Two attributes of the GFCS contribute to the extraction and distribution of raw materials on a vast scale. First, commodity systems standardize the characteristics of raw commodities. This means that regardless of the supplier’s region the product is the same worldwide: corn from China, the US, or Brazil holds the same value on the commodities market. Where and how much of these commodities are produced is determined by the abstract power and money that control the market. Second, the producer with the lowest price makes the sale.

*Standardization and low price make commodities dependable, accessible and affordable. Processors can depend upon and plan for a specific grade of raw material — from Brazil one month, Iowa the next, Canada the next. Commodities are produced wherever it can be done for lowest costs, thereby increasing economic efficiency. More products become more available for less money. Taken together, these two trends—more and more production and lower and lower prices—are the representative behaviors of commodity systems.*

(Sawin et al. 2003, 7)
Figure 1.1 below illustrates the drivers and behaviors of the GFCS.

![Production Growth Drivers](image)

**Figure 1.1. Behaviour of a Commodity System**

This figure shows the behaviour of a commodity system. As demand goes up total production goes up. As profits go up, reinvestment in commodity production goes up so capacity and therefore production go up. As production increases, prices increase which leads to an increase in efficiency and scale and then to an increased capacity for total production. What is important to notice here is that production is always going up; the system does not have balance. (Adapted from Sawin et al. 2003, 10)

The re-investment, growth in demand, and efficiency boosting drivers of the GFCS have created trends that contribute to the decreasing health of ecological and social systems. These include resource depletion, environmental pollution and community decline. On a global scale, food commodities are produced in regions best suited for their growth. Disasters that destroy crops in one area of the world affect food availability across the entire global system, resonating at the local level. Large-scale, industrial, monoculture farms (which produce food for the GFCS) have led to a systematic increase in toxic pollutants such as the use of chemical pesticides which have negative health effects on the human body (Horrigan,

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2 A note on reading causal loop diagrams: In such diagrams, each of the arrows represents a causal connection. The loop to the left shows that increasing profits, everything else in the system being constant, will lead to an increase in total production. The ‘+’ at the arrow indicates that the change in total production is in the “same direction” as the change in total profit: more production leads to more profit. More profit typically leads to more reinvestment in the system, which leads to higher total production. This creates a cycle of growth called a reinforcing loop.
Lawrence, and Walker 2002, 449) or in the application of fertilizers which contribute to the degradation of ecosystems (Vitousek et al. 1997, 2). As human and ecosystem health declines, the web of community resilience weakens. The capitalistic market through which commodities are traded on a global scale creates impersonal relationships between people operating the system (Vergunst 2001, 3). Becoming more and more regulated by money and power, people are increasingly disconnected and alienated. Public interest in the consequences of the GFCS is growing as stories of degrading social and ecological systems, such as fish stock depletion and pollution of water and air, become common.

As demand increases and availability of natural resources declines, there is a reduction in society’s options to secure desired resources. The decreasing number of options can be illustrated by the metaphor of a funnel (see Figure 1.2). Society is experiencing decreasing supplies of natural resources such as coal and oil, decreasing productivity of agricultural land, depleting fish stocks, diminishing social networks, loss of species and biodiversity, and fewer ‘stories of meaning' that connect us. We are simultaneously experiencing increasing waste, population, pollution, and habitat loss, as well as increased market pressure, competitiveness and regulation (Robèrt 2000, 246).

![Figure 1.2. The Funnel Metaphor](Adapted from Robèrt 2006)
The walls of the funnel narrow as resources decline and demands increase. This provides less option for restoration and less time for action. When making choices that avoid hitting the walls of the funnel, we are guided toward a future where basic principles for socio-ecological sustainability are not violated. These Sustainability Principles are expressed below.

### 1.2 Sustainable Development

The commonly used Brundtland definition for sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” This definition conveys the understanding that actions taken today will impact people tomorrow. It does not further explain ‘needs,’ nor the implications of their not being met, and therefore can be interpreted as a value statement. Since a value statement does not provide guidance for a specific course of action, coupling this definition with scientifically agreed upon principles for sustainability is helpful. Science can explain what must or must not be done so that ‘the ability of future generations to meet their needs’ is not undermined. Returning to the funnel metaphor, ensuring that the ecological and social systems are not being systematically degraded can stop the narrowing of the funnel walls. (Broman 2007).
1.2.1 Sustainability Principles

Following from the above reasoning, Dr. Karl-Henrik Robèrt initiated a process to build scientific consensus regarding how social and ecological systems can be systematically degraded. First, basic principles of non-sustainability were identified by clustering the myriad of downstream socio-ecological impacts into a few well-defined upstream mechanisms. Then a “not” was inserted in front of each to direct focus to the underlying systematic errors of societal design. This led to the initial formulation of four basic principles for sustainability (Holmberg et al. 1996). They form the Sustainability Principles (SPs), also known as “The Natural Step (TNS) System Conditions,” after the non-governmental organization (NGO) that has facilitated their development and application. After several revisions, the current wordings of the SPs are:
In the sustainable society, nature is *not* subject to systematically increasing…

I. Concentrations of substances extracted from the Earth’s crust  
II. Concentrations of substances produced by society  
III. Degradation by physical means, and in that society…  
IV. People are *not* subject to conditions that systematically undermine their capacity to meet their needs.

While there are many approaches to sustainable development, few are guided by a shared understanding of principles that define the end goal for sustainability. The Sustainability Principles are based on scientific consensus and have been peer-reviewed. The constraints of these principles define an end-goal for sustainability and they will be used throughout this paper to plan strategically for socio-ecological sustainability in the biosphere (Holmberg et al. 1996; Ny et al. 2006, 64\(^3\)).

### 1.2.2 Framework for Strategic Sustainable Development

In order to have a consistent understanding of systems and shared way of thinking, we used the generic five-level model described in Robèrt et al. (2002) and Robèrt (2000). The *System* level involves awareness of the system itself, its boundaries, and its relationship to other systems. The second level describes *Success* in the system. The third level is the *Strategy* level. At this level, strategies to achieve success (level 2) in the system (level 1) are developed or analyzed. The fourth level is the *Action* level, which describes the actions that can be taken in order to implement the strategies (level 3) to achieve success (level 2) in the system (level 1). Finally, the fifth level is the *Tool* level. This level describes various tools (for example, tools that aid in strategy development, capacity building, or systems analysis) that can assist at the other levels.

\(^3\) First published in Holmberg et al. 1996, subsequently refined by Ny et al. 2006.
When the five-level framework is used to strategically plan for sustainable development of society in the biosphere, it is referred to as the framework for strategic sustainable development (FSSD). A key feature of this framework is the incorporation of the Sustainability Principles at the success level. This framework is also called “The Natural Step (TNS) Framework” or the “backcasting from sustainability principles (BSP) framework” from its main operational philosophy (Robèrt et al. 1997, Holmberg et al. 1999, Holmberg and Robèrt 2000, Robèrt 2000, Robèrt et al. 2000, Robèrt et al. 2002, Ny et al. 2006, Byggeth et al. 2007).

With the FSSD, the first (system) level describes basic functioning of society in the biosphere and is based on laws of thermodynamics, natural cycles, and social systems. The next (success) level is defined by what is necessary for a sustainable society to exist within the system (i.e. the Sustainability Principles). At the strategy level, strategic guidelines inform the process of strategic sustainable development (i.e. strategic movement towards compliance with the Sustainability Principles). A primary strategic guideline is “backcasting from principles of success.” This refers to a method that envisions the achievement of success in the future and uses this vision to plan the best possible course of action to get there (further description will follow in Section 2.2.1). The action level describes the concrete steps to be taken. The final (tool) level refers to tools that assist in moving toward sustainability, e.g., Ecological Footprinting, Agenda 21, and ISO 14001 (Robèrt 2000).

1.2.3 Creating a Vision

The system can be further described in the context of a specific societal challenge or entity (e.g. an organization, community or other sub-system within society). Success in this system can be defined by a description of constraints as ‘not contributing to the violation of the overall conditions (i.e. principles) for sustainability’ and then additionally by developing a vision for the sub-system within those constraints.
While the Sustainability Principles define a minimum for success within the biosphere (socio-ecological sustainability), a compelling vision can inspire people to act. A vision of success is a shared understanding of what an organization, community, or other sub-system looks like in the future once it has achieved success. When thinking strategically, this vision can be a starting point for both short and long term planning.

1.3 Realizing Human Needs

The Brundtland definition for sustainability and the fourth Sustainability Principle both refer to the ability of people to meet their needs. However, there is no explanation of what these human ‘needs’ are. We have chosen to supply a useful definition of human needs (see Table 1.1) elaborated by Chilean economist Manfred Max-Neef (1991). This classification of *Human Needs* is particularly useful as it recognizes that the ways in which needs are satisfied varies by culture and over time. Furthermore, Max-Neef’s *Human Needs* are non-hierarchical, thus allowing for ‘synergistic’ satisfaction of needs by a single satisfier.

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Table 1.1. Human Needs

<table>
<thead>
<tr>
<th>Subsistence</th>
<th>Freedom</th>
<th>Affection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creation</td>
<td>Participation</td>
<td>Understanding</td>
</tr>
<tr>
<td>Identity</td>
<td>Idleness</td>
<td>Protection</td>
</tr>
</tbody>
</table>

Satisfiers of *Human Needs* are expressed through forms of Being, Having, Doing and Interacting⁵. The efficiency of a satisfier can be affected in positive and negative ways by economic goods. The interrelationship between *Human Needs*, satisfiers, and economic goods is permanent and dynamic. Since economic goods have the possibility to affect the satisfaction of *Human Needs*, they can also be determinant in generating and creating economic goods. This paper explores this interrelationship by means of a community food system, the goods and services that it can provide, and how this leads to the satisfaction of *Human Needs*. The reciprocal causation becomes both part and definition of a culture. Table 1.2 contains a partial *Human Needs* matrix with an example of two needs and possible satisfiers (Max-Neef 1991, 30).

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⁵ Being registers attributes, personal or collective, that are exercised as nouns. Having registers institutions, norms, mechanisms, tools (not in a material sense), laws, etc, that can be expressed in one or more words. Doing registers actions, personal or collective, that can be expressed as verbs. Interacting registers locations and milieus (as time and spaces).
Table 1.2. Partial Human Needs Matrix.
Adapted from Max-Neef’s Human Scale Development (1991, 32).

<table>
<thead>
<tr>
<th>Existential Categories</th>
<th>Being</th>
<th>Having</th>
<th>Doing</th>
<th>Interacting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsistence</td>
<td>Physical health</td>
<td>Food</td>
<td>Feed</td>
<td>Social setting</td>
</tr>
<tr>
<td></td>
<td>Mental health</td>
<td>Shelter</td>
<td>Procreate</td>
<td>Living</td>
</tr>
<tr>
<td></td>
<td>Equilibrium</td>
<td>Work</td>
<td>Work</td>
<td>environment</td>
</tr>
<tr>
<td></td>
<td>Sense of humour</td>
<td>Feed</td>
<td>Rest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adaptability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td>Adapatability</td>
<td>Rights</td>
<td>Cooperate</td>
<td>Parties</td>
</tr>
<tr>
<td></td>
<td>Willingness</td>
<td>Responsibility</td>
<td>Propose</td>
<td>Associations</td>
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<td></td>
<td>Determination</td>
<td>Privileges</td>
<td>Share</td>
<td>Communities</td>
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<td>Receptiveness</td>
<td>Work</td>
<td>Dissent</td>
<td>Family</td>
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<tr>
<td></td>
<td>Passion</td>
<td>Duties</td>
<td>Interact</td>
<td>Neighbourhoods</td>
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<td>Dedication</td>
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<td>Agree on</td>
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<td>Churches</td>
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A closer look at the squares above demonstrates how satisfiers may give rise to economic goods. For example, the square of satisfiers for Being and Subsistence highlights physical health, mental health, equilibrium, sense of humour, and adaptability. Goods developed around these satisfiers would be components of food, shelter, and work, such as nutritious food, adequate shelter, and meaningful work.

On the other hand, the deprivation of Human Needs can lead to development of personal and societal pathologies. For example, the current global commodification of food has a number of implications that trickle down to the community level. The economic value of food is driven by a global market, complicated with political agendas to drive down prices, and the consolidation of the food system into relatively few corporate parties who place profit margins as their primary concern. Food production, processing, distribution, and disposal all have many social and environmental ramifications that significantly impact communities. Soil erosion, increasing water demand, pollution from agricultural runoff, greenhouse gas emissions leading to climate change, job loss due to mechanization of farming, and obesity partially due to poor food quality are just a few examples (Davis et al. 2004, 11). According to Drewnowski and Spector (2004, 14), the GFCS and its system of prices and trade support “low-cost, energy-dense diets [with] added sugars and vegetable fats” that
are key factors in the obesity epidemic of North America. “Americans are gaining more and more weight while consuming more added sugars and fats and are spending a lower proportion of their income on food. No longer a purely medical issue, obesity has become a societal and public health problem.” This problem, as well as the others mentioned above, all contribute to inhibitors of Human Needs.

1.4 Communities

Many municipal charters reflect communities’ intent to meet Human Needs and to be environmentally sustainable. One example from the federation of Canadian municipalities states that:

The purposes of a municipality under the Charter include providing for:

- The health and the social and economic well-being of its community and of current and future generations of the municipality’s citizens, and
- The stewardship of its assets and the natural environment.

(Lidstone 2005, 3)

Here the purpose of a community is defined as providing for the current and future needs of its citizens and the environment (ecosystems) upon which they depend. The components of the community system such as its food, educational, and governance systems are examples of means to reach these goals. A community will likely choose to add some further definition for success in order to be more than sustainable—that is, the community will put forth a compelling vision.

The framework for strategic sustainable development is a useful tool for communities working towards sustainability. Whistler, a municipality in British Columbia, Canada, is an example of a community that is utilizing the FSSD for community planning. After outlining a vision of success: “Whistler will be the premier mountain resort community–as we move toward sustainability,” sixteen strategies were developed that help the municipality work toward achieving its vision (Whistler 2020, 2005). Whistler is currently preparing a 17th strategy to address its food system
(Shannon Gordon, pers. comm.). The FSSD framework and Whistler’s strategies are listed in Figure 1.5.

![Diagram of FSSD framework and Whistler’s strategies]

**Figure 1.5. Whistler's 16 Strategy Areas + Food.**

### 1.5 Community Food Systems

Due to the ecologically and socially destructive nature of the GFCS, the food system needs to reflect more than an economic will. It can do this by also working toward sustainability and the meeting of *Human Needs* in order to enhance the health of people and the communities in which they live.
1.5.1 Definition of CFS

A community food system is defined as follows:

"A ‘community food system’ (CFS) is one in which sustainable food production, processing, distribution and consumption are integrated to enhance the environmental, economic, social and nutritional health of a particular place" (Feenstra and Garrett 1999, 2).

In this thesis, we combine this definition with our understanding of sustainability in order to work toward a sustainable CFS.

Community food systems can incorporate environmental and social aspects that are overlooked in the GFCS. They provide an opportunity for citizens to directly enhance their health, as well as that of the food system and the community. According to Pretty (2001, 9), they provide three types of benefits:

1. Environmental benefits through more sustainable production systems and reduced transport externalities;
2. Economic benefits through greater incomes for farmers and more financial contributions to local economies; and
3. Social benefits through greater trust and connectedness between and within consumers and producer groups.

1.5.2 The CFS Advantage

Food, interconnected with environmental, economic and social systems, is a unique opportunity to leverage possibilities for people to realize their Human Needs. In fact, we hope to show that a healthy food system can contribute to meeting all nine Human Needs.

Nutritional benefits of fresh, local, and organic foods from a CFS can enrich the lives of community citizens. The availability of fresh foods encourages individuals to become more involved with the purchasing, preparing, and eating of foods. This may reduce their consumption of highly processed and refined foods. And as individuals’ health increases, overall health in the community increases. Ill-health can be an inhibitor to the satisfaction of needs while good health can help to satisfy them.
The food system, and particularly a community food system, is an ideal tool for introducing people to systems thinking which we believe is necessary for solving the complex problems now facing humanity. The industrial revolution brought forth a way of thinking that suggests the way to solve a problem is to “divide and conquer.” While this way of thinking works with mechanical systems, it leaves in its wake the environmental and social destruction mentioned above, ignoring the complexity of systems. Food, while seemingly a simple satisfier of a basic need (*Subsistence*), is an integral part of a complex system.

Because of its direct connection to the earth, the food system provides a unique opportunity to educate people about where food comes from, how it is grown, and how it affects humans’ physical health and the health of ecosystems. It is an opportunity to connect people directly with the ecological and social networks of which they are a part; it is an opportunity to connect with the whole.

The community food system is also an avenue through which communities can employ “upstream” thinking. This method of thinking advocates proactive rather than reactive behavior, i.e., investing upfront in order to save later. For example, working upstream (proactively) would mean improving the quality of food in order to deliver more nutritional, healthier, safer food and thus prevent ill-health in individuals. This makes significantly more sense than responding downstream (reactively) by treating symptoms through elaborate healthcare systems that are caused by a poor diet.

### 1.5.3 From ‘Food Commodity’ to ‘Community Food System’

Strengthening the food system can be done in many ways. One is to work within the current GFCS to reshape the system so that individually rational choices are also collectively sustainable. Another is to work outside the global system to increase the viability of community systems.

*Acting as individuals, a viable option for producers is to leave the [GFCS] system altogether and focus on a product that can be marketed outside of the structure of that commodity system. This can*
be accomplished by programs that preserve the history and identity of the product. There are many examples of producers who have created—or re-created—alternatives to conventional commodities. These examples... connect people back to the raw materials of consumption, and provide vibrant examples of what healthy food, lumber, and fiber systems look like. By linking consumers directly with the producers of basic raw materials, such initiatives preserve some of the information that is lost in the process of commodification. (Sawin et al. 2003, 23)

Another option is to emphasize the necessity of both systems toward the “aggressive creation of products, processes and companies that are truly creating restorative and enduring wealth—leaving communities and larger living systems in better condition, not worse” (Senge 2006, 8). While there is likely a need for both GFCS and community food systems in balance, currently a significant imbalance exists between the two. Creating local initiatives that strengthen the economy, ecology, and social networks of the community can help restore balance between these systems.

1.5.4 Strategic Sustainable Development of the CFS

Introducing systems thinking, educating community members about ecosystems, and sharing the concept of upstream planning are all examples of ways a community might utilize its CFS to work toward achieving its vision of providing opportunities to meet Human Needs and being sustainable (see middle column in Figure 1.7).

However, before a community can utilize its food system in this way, it would be helpful to understand how to develop the best community food system possible. So if we return to the FSSD with the CFS at the system level (the column on the right in Figure 1.7), we define success as compliance with the SPs and providing opportunities to meet Human Needs (as similarly defined for the community). The following vision for a

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6 It is important to note that because we are working with a theoretical community, our definition of success does not extend beyond the scope of this study. However, communities utilizing the FSSD can, and should, incorporate more detail in their definition of success through the customization of a vision for their community food system in order to better elaborate their own goals given their community’s specific circumstances.
A community food system helps to clarify our definition of success:

*Through the creation of a vibrant community food system, we will restore and enhance ecological and social systems while providing opportunities to meet Human Needs and complying with the principles for sustainability.*

![Diagram of FSSD for the Community Food System](image)

*Figure 1.7. FSSD for the Community Food System.*

Note that the ovals both contain the community food system. White text (with black background) represents the focus areas of this paper. An area for additional study is how the CFS could be utilized by a community.

The relationship between a community and its CFS is further illustrated in Figure 1.8. The community food system exists within the context of a community, the community exists within the context of society, and society exists within the biosphere. Our study is intended to help individuals within communities better understand the possibilities of a CFS in working toward
satisfying *Human Needs* within constraints of the Sustainability Principles. We recognize that the definition of ‘community’—and the scope that it can imply—varies considerably; we encourage communities to define this based on their own circumstances. However, in this paper, our research refers to community as a town, village, or city that is large enough to be governed by a municipal authority, but small enough that there are still opportunities for individuals to have direct interactions with one another on a regular basis.

![Figure 1.8. Nested Systems.](image)

*The Community Food System (CFS) exists within community, within society, within the biosphere.*

### 1.6 Research Questions

Exploring the potential of community food systems to meet *Human Needs* while working within the constraints of the SPs has led us to the following questions to guide our research:

**Primary Question:**
How can the development of a community food system help a community realize sustainability and the meeting of *Human Needs*?

In order to answer this question we will explore the following questions:

How can a community food system provide opportunities to satisfy *Human Needs*?

What strategies might a community consider in working toward a sustainable community food system?
2 Methods

2.1 Model for Qualitative Research Design

Maxwell's Qualitative Research Design informed this project (2005). This approach suggests that the research process is iterative such that research questions and goals may continually be updated as methods are conducted and the conceptual framework of the researchers evolves.

Figure 2.1. Maxwell's Qualitative Research Design

2.2 Conceptual Frameworks

Throughout this research, several mental models were used to provide a foundation for contemplation and to clarify thinking. A five-level model for strategic sustainable development provides a framework for understanding, analyzing, and planning within complex systems (Robèrt et al. 2002; Robèrt 2000). Backcasting, as a planning procedure by which a successful planning outcome is imagined in the future, is a method for planning...
without the constraints of past trends (Holmberg and Robèrt 2000). The ABCD process guides the process of backcasting and aids in putting forth a vision for what a sustainable community food system might look like. It is also helpful in considering strategies that could be used by a community to move towards that vision. Finally, a spiral represents the recursive process of our research. After an initial application of methods, each method is revisited at a deeper level in a successive iteration. Additional detail regarding these methods is provided in the following sections.

2.2.1 Backcasting

Backcasting is best explained by contrasting it with the more common method of forecasting. In forecasting, one looks at trends and extrapolates those trends into the future. With regard to the food system, it is clear that some trends are not sustainable and not desirable in a future that is sustainable and provides opportunities to meet all Human Needs. An alternative to forecasting is backcasting. Backcasting disconnects from past and current trends in order to put forth a vision that is not constrained by those trends. An example of backcasting is provided by Dreborg (1996) and the figure below illustrates the difference between forecasting and backcasting.

![Figure 2.2. Forecasting and Backcasting](image)

*Figure 2.2. Forecasting and Backcasting.*

When forecasting, depicted by the illustration on the left, one considers the path that has led to one’s current position and projects that trend into the future. Backcasting, pictured on the right, considers a desired future, then looks back to today’s position from that imagined future, and considers how to strategically move from the current position to the desired future position.
There are two approaches to establishing a future vision from which one can backcast. The first, backcasting from a specific scenario, works well when a specific picture of the future is possible—much like a jigsaw puzzle (Holmberg and Robèrt 2000, Robèrt 2000, Robèrt et al. 2002). Sometimes it is difficult for a group of people to agree upon a single, specific vision of the future, especially since the future holds many unknown considerations that may affect decision-making (e.g. advances in technology). Instead, it may be preferable to backcast from principles (rather than specific scenarios). Principles guide the process towards success in a way that allows for the development of many possible scenarios over time. The sustainability principles described earlier provide the minimum constraints for a sustainable society, and hence backcasting from sustainability principles is an essential element of the framework for strategic sustainable development.

2.2.2 ABCD Process

The ABCD planning process utilizes a method of backcasting from principles and an awareness of a system (supported by the 5LF) to plan for success in that system (Robèrt et al. 2002).

![ABCD Process Diagram](image)

_Figure 2.3. ABCD Process_

The first step (A - "Awareness of System") develops awareness of the system, including the system's relationship to other systems. This initial step encourages one to step back and take a 'big-picture perspective.' For
this thesis, it requires realizing that a food system exists within society within the biosphere.

The second and third steps rely upon each other and must be undertaken iteratively. The second step (B – "Baseline Assessment") is an analysis of current operations of the system. Returning to the funnel metaphor, this step defines the global food commodity system’s current reality in relation to the Sustainability Principles and the declining opportunities for socio-ecological sustainability.

The third step (C - "Compelling Vision") provides a creative license (with constraints) to put forth a vision of success. The intent is that this vision arrives at success in the future by complying with conditions of success (level 2 in the FSSD) in that system. Inherent in this, then, is that a subsystem must also comply with the conditions of success for a parent system. For example, in order for the community food system, as a subsystem of society in the biosphere, to be successful, it must meet its own conditions for success and the conditions for success for society in the biosphere (the four Sustainability Principles). For the CFS that we are working with in this paper, success includes compliance with the sustainability principles (which is ‘success’ for the parent system—society) and also providing opportunities to meet Human Needs.

The fourth step (D - "Down to Action") involves looking at the baseline assessment (B) from the perspective of the compelling vision (C) and asking what strategies will move the organization from B to C. There are three guiding questions that can be used to ensure that these strategies are appropriate and do not lead down ‘blind alleys’ that could be a waste of resources: Does the strategy move in the right direction (i.e. toward a more sustainable future)? Is the strategy a flexible platform? Will the strategy provide an adequate (social, financial, political, etc.) return on investment so that it may be continued? With regard to this thesis, we are asking "What strategies might a community use to move toward a food system that is sustainable and meets Human Needs?" (Robèrt et al. 2002).

### 2.2.3 Spiral Method

The ensuing methods, particularly the Human Needs Assessment and the systems analysis, in large extent inform one another. With that in mind, we
began one method, then started the other method, then returned to the previous method to update our work, and so on. This intentional, iterative approach allowed both methods to develop more completely than if they were done in a simple, linear fashion.

Figure 2.4. Spiral Method

With the above ways of thinking to guide our work, we utilized the following methods.

### 2.3 Literature Review

This method provided awareness of existing research and information regarding current work in the design and development of community food systems. Resources included books, journal articles, community food system websites, and various annual or project reports from relevant organizations. Information collected during this review was used specifically to inform our Human Needs Assessment (see Section 2.4) and the systems analysis, in addition to providing us with an overview of
relevant work related to the topic. This is the primary method used to inform our ‘B’ step in the ABCD process.

During our literature review, we identified three communities with detailed community food system strategies that we examined for a more in-depth analysis. Included are Bella Coola Valley (BC, Canada), Dane County (WI, USA), and Broadland (UK). Each of these communities had significant amounts of information available online, and we were able to interview representatives from Bella Coola and Dane County. We also interviewed Cathleen Kneen, a representative of the British Columbia Food Systems Network. Our research enabled us to gain additional insight to the challenges and unanticipated opportunities that communities were facing as they pursued development of a community food system. We used all of the information gathered to further inform our Human Needs Assessment and systems analysis.

We also used two other studies to assist in compiling strategies for community food systems. The Vivid Picture Project is working to put forth a vision for a sustainable food system for the state of California. The second is a master’s thesis from the University of Michigan: “Toward a Sustainable Food System: Assessment and Action Plan for Localization in Washtenaw County, Michigan.” Each of these resources includes strategies that have been developed by diverse stakeholders and based on several other existing community food systems.

### 2.4 Human Needs Assessment

We completed a Human Needs matrix to begin exploring how a CFS could aid in meeting the nine Human Needs set forth by Max-Neef. This assessment involved creating a matrix with two categories (existential and axiological) in order to demonstrate the interaction of existential needs (being, having, doing, interacting) with axiological needs (Subsistence, Protection, Affection, Understanding, Participation, Idleness, Creation, Identity, and Freedom) (Max-Neef 1991, 30). The matrix was then completed by filling in existential ways in which a community food system could meet those needs.
2.5 Systems Analysis

The Human Needs Assessment outlined above provided a static and linear perspective on how Human Needs could be satisfied by a CFS. These findings were then used as input to a dynamic and cyclical representation that more adequately reflects the way in which a CFS works. Causal loop diagrams (CLD) were used to map out the interrelationships between various parts of the community food system. Utilizing a systems perspective, and specifically using causal-loop diagrams to represent the system, we were able to visually represent the ways in which components of a CFS can work synergistically to provide opportunities to meet Human Needs.

To create these CLDs, we considered each of the nine Human Needs individually and asked the question: “How can a CFS provide opportunities to satisfy the need for [this specific Human Need]?” We answered that question by first brainstorming a list of actors and components in a CFS. We then considered the relationships between those components, using our research and literature review to support our conclusions. Then, we mapped our results using CLDs to illustrate the impacts the components have on the opportunity to meet each Need, as well as the reinforcing effects these components have upon each other.\(^7\)

These diagrams, as visual representations of the way components of a CFS might influence each other, aided us in identifying satisfiers of Human Needs and leverage points within the CFS that can maximize the opportunities to satisfy Human Needs.

2.6 Strategy Development

During our literature review we compiled a list of strategies from three communities and the two additional resources mentioned above. Independent of that strategy list, we created another list containing strategies derived from our CLDs—essentially strategies that we think a

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\(^7\) Note that these CLDs do not have any negative causality. This is because of the way in which we phrased the question at the center of each diagram.
community could use in pursuit of a community food system that is focused on creating opportunities for people to meet their *Human Needs*.

The list of strategies from the CLDs was compared to the list of strategies from communities in the literature review. This comparison allowed us to see if our analysis missed significant strategies being implemented by these communities.
3 Results

Our results begin by demonstrating how a community food system can produce satisfiers of *Human Needs* and then present strategies that a community might use to work toward a sustainable community food system that provides opportunities to meet all *Human Needs*.

3.1 Satisfying *Human Needs* with a Community Food System

Our systems analysis was based on the relationship between community food systems and the realization of *Human Needs*. Using information compiled in our literature review, community food strategy documents, and drawing from conversations with community food council/network members, we constructed causal loop diagrams for each of the nine *Human Needs*. For each *Need*, we explored ways in which a CFS provides opportunities to meet that specific *Need*. We began first by looking at our *Human Needs* Assessment Matrix (Appendix A) to determine what factors within the CFS would be beneficial to examine more systematically. We realized that the matrix provided us with a good starting point for our analysis, but that a comprehensive analysis would require much more elaboration. Between the satisfiers we outlined in the matrix and the satisfaction of a *Human Need* there is a series of complex relationships and connections to other components within the community system. Our CLD analysis process helped us to further clarify some of these relationships.

Starting with an individual *Human Need* in the middle of each diagram, we began to plot out opportunities (expressed as nouns) within the CFS that can lead to the satisfaction of a *Human Need*. The process of addressing each *Human Need* individually led to the composition of many unique and common terms with each diagram we drew. The CLD analysis process was iterative, so after cycling through each diagram, we returned to them once again to re-evaluate our process and support our connections with further research. As we progressed, we began to see commonalities and closely related concepts emerging as key elements to answering the question: How can a community food system provide opportunities to meet *Human Needs*?
We then began the process of compiling composite diagrams for each of the nine *Human Needs*, utilizing common terminology to remain consistent with each iteration.

Eventually, we produced a composite diagram (Figure 3.1) to summarize all of our CLD analysis into one diagram that speaks to all nine *Human Needs* collectively. It is important to note that the CLD analysis was used primarily as an informative process to help guide systems thinking in the development of our research and conclusions. We used the complex diagrams to help us define key elements of CFS that can serve as leverage points to bring forth satisfiers of *Human Needs*. These elements, presented below, are not always explicit in the composite CLD diagrams; however, the systems analysis was a valuable tool in formulating our conclusions.

An explanation of the CLD components (satisfiers and leverage points) is provided in the following sub-sections. This explanation describes the connections within the CLD and should be referred to in order to provide meaning to the composite CLD in Figure 3.1. Diagrams for each of the nine *Human Needs* can be found in Appendix B; these diagrams may also be useful to the reader to see more detailed connections.
Figure 3.1. Composite Causal Loop Diagram. This diagram illustrates how the CFS can provide opportunities to meet Human Needs. Satisfiers are in CAPS; Community Food System leverage points are in lower case.

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Note that all arrows in this diagram are positive arrows, as this diagram was created to answer the question “How can the community food system provide opportunities to satisfy Human Needs?” If we were to include negative arrows (balancing loops) we would need to ask a different question, i.e. “How can the satisfaction of Human Needs be inhibited by a community food system?”
3.1.1 Satisfiers

Satisfiers are defined as nouns that can be directly linked to meeting one or more Human Needs. Satisfiers can refer to just one need, but often serve to meet several (synergistic satisfiers). These satisfiers, although derived through our analysis of community food systems, are broad in scope and can be achieved in a variety of ways that do not necessarily involve the community food system. In fact, many other community sub-systems also provide opportunities that lead towards these satisfiers for Human Needs. The CFS may also lead to even more satisfiers that were not identified in our research process. The satisfiers defined below were chosen because they were the most common in our analysis.

Health and Wellness. In our description of Health and Wellness we are referring to physical, mental, and emotional health. Our analysis demonstrates that a nutritious diet and healthy lifestyle are important components of Identity and Subsistence. Physical appearance and mental capacity help individuals define themselves, while body system health is a key factor in physical endurance and immune system function. A healthier individual not constrained by mental or physical illness has more Opportunities for Expression and mobility, which can stimulate Participation, further leading individuals towards the satisfaction of the needs of Creation, Idleness, and Freedom.

Healthy Community Relations. This refers to the interaction and cooperation between members of a community. Building relations between community members can lead to a greater sense of mutual trust and responsibility between parties. It can also foster community participation and sharing between individuals. Respect and cooperation within the community provides opportunities to meet the needs of Affection, Participation, Identity, Creation, Idleness, and Understanding.

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9 These conclusions are based primarily on our intuition and consensus. We provide references where readily available, but find that in general there is a lack of scientific study linking satisfiers directly with human needs. There is no universal definition of human needs, and even in referring to Max-Neef’s definitions there is significant subjectivity in determining satisfiers of Human Needs, and this varies substantially over time and between cultures. However, we feel that our conclusions are fair and that the reader will not find any alarming conclusions here. For more information addressing Human Needs and the process of determining satisfiers, please refer to Max-Neef.
Sense of Place. Through a Sense of Place, individuals can discover the cultural and regional identity of their communities. Place, in this context, is defined as “the composite of physical, biological, and human (cultural, historical, familial, aesthetic, etc.) elements that compel a sense of connection” (Lockwood 1999, 372). This can foster the need for Understanding as one becomes more knowledgeable about the surrounding physical and social environment. It can also cultivate the desire for Participation as the connection to place grows and an individual becomes more inspired to become involved in the community. The satisfier of Ecological Awareness can further enhance Sense of Place, and lead to an enlightened meaning of Identity. We found Sense of Place is also linked to meeting the needs for Affection and Creation.

Ecological Awareness. Ecological Awareness is a term to describe the understanding of the relationships existing between a living organisms and its environment. This also refers to knowledge of the ecological systems in which humans play a vital role, and is helpful in describing interconnectedness and the cyclical nature of the biosphere. We found it to be a satisfier for the needs of Understanding and Identity, and also a reinforcement of the other satisfiers, particularly Sense of Place and Health and Wellness.

Community Resilience. Community Resilience, or the ability of a community to endure stress, is an important satisfier of the need for Protection. This is built off the notion that individuals feel safer and more secure knowing that their community has effective systems for managing unexpected crises and that their needs will be addressed during times of emergency. Community Resilience is connected to Healthy Community Relations. Building trust and cooperation among members of a community strengthens its ability to respond to difficult situations. “Self-reliance assumes that people have a leading role in different domains and spaces, so that development processes can be promoted that have synergetic effects that satisfy fundamental human needs” (Vergunst 2002, 153). The connection between Community Resilience and Health and Wellness means that healthier residents may also be more capable of contributing to the community while less resource expenditure in costly medical treatments provides the community with greater monetary capacity to fulfill other civic responsibilities, such as strengthening the preventative health care system. In this way, Community Resilience can also provide more opportunities for Freedom and Subsistence.
Opportunities for Expression. Expression can take many forms and can satisfy Human Needs in a variety of ways. Examples are communication, art, cultural activities, or media. Opportunities for Expression can be manifested through Meaningful Employment and Healthy Community Relations, contributing to the needs of Identity and Participation. Opportunities for Expression are directly linked with the need of Creation and can provide opportunities for Freedom, Idleness, and Understanding.

Meaningful Employment. Employment provides the economic means for individuals to meet the basic need for Subsistence. If an individual is inspired by a “meaningful” form of employment there is greater opportunity for the needs of Identity and Participation to be met.

3.1.2 Leverage Points

Leverage points refer specifically to elements of the community food system that can elicit multiple satisfiers. While the satisfiers are broad in scope and can be triggered in a multitude of ways, the leverage points that we define are specific aspects of community food systems that provide opportunities for individuals to satisfy Human Needs. Our analysis highlights aspects of greater potential that we feel are important considerations for developing community food systems. The following leverage points are described in reference to the above satisfiers for the sake of clarifying our results. However, we feel that there are many other avenues to satisfy Human Needs beyond what we have listed here.

Once again, we compiled repetitive themes illustrated in our CLDs to come up with the following components of a CFS that we feel provide the strongest opportunities for meeting all nine Human Needs:

Access and Availability of Healthy Foods. Accessibility implies affordability and equity of the community food supply, while availability refers to the physical location of markets and locations where food can be distributed to the consumer. Having limited access to healthy foods is a barrier to a nutritious diet (Morland et al. 2002, 23-9). Equitable access and availability of healthy foods is a vital requirement in ensuring a nutritious and balanced diet that can lead to a “healthy and satisfying life for each
resident” (Proscio 2006, 20). In this way, it can be a valuable precursor to the satisfiers of Health and Wellness and Opportunities for Expression.

Food Education. Educational opportunities can take many forms within the community food system, including classes in cooking, gardening, and nutrition. Information can be designed for school curricula, distributed through marketing campaigns, or disseminated through active participation and volunteer work with food-based community organizations. This participation can cultivate transformative adult learning which can lead to Ecological Awareness and a stronger Sense of Place (Levkoe 2006, 89). Health and food education can also provide incentives for individuals to consume a more nutritious diet leading them towards Health and Wellness.

Food Gathering Places. Food gathering places refers to places within a community where people congregate together to eat in a social setting. Examples are restaurants, cafes, kitchens, school and institutional cafeterias, and community events. These places foster the development of Healthy Community Relations and Meaningful Employment.

Community Food Growing Places. Examples of community food growing places are community gardens, school and university gardens, back yards, and other places where community members have an opportunity to experience and learn about the cultivation of food. Developing a relationship with the land through cultivation leads to understanding (Lockwood 1999, 369) often expressed through Sense of Place. These places provide a direct opportunity for Participation in the process of growing food that can raise Ecological Awareness through understanding of the ecological cycles of the plants being grown. This is often the goal of community garden projects (Anderson 2007). There is evidence that people who are active in community gardens often notice that their participation alleviates stress and they feel healthier and have a better understanding of nutrition and health (Levkoe 2006, 90-4). This can positively impact Health and Wellness.

Local Food Production. Local food production is an important component of a community food system. Locally grown food that is distributed and marketed to the community provides residents with opportunities to learn about the environmental and cultural Identity of their communities. Community Supported Agriculture (CSA) programs can promote “civic responsibility and enhance [individuals’] feelings of connectedness to the
land and the generative quality of nature” (Cone and Myhre 2000, 187-97). These attributes can be realized through Ecological Awareness and a Sense of Place. Local food production also increases a community’s sovereignty and Resilience, by increasing their means of self-reliance and by providing alternative food sources to the current food supply.

Local Food Markets. Local food markets can provide the link between local food production and the consumer, as well as provide residents with access and availability to healthy foods. Our definition of local food markets includes grocery stores, farmer’s markets, and other food retail outlets that emphasize trade within the local community. These places provide opportunities for social interaction that can build Healthy Community Relations and Meaningful Employment opportunities. There is strong evidence that farmer’s markets serve as effective means to allow consumers to interact directly with food growers, which can increase trust and accountability between both parties (La Trobe 2001, 182). A greater Understanding can develop, guided by connection to food sources through Sense of Place. Farmer’s markets are also important drivers to access and availability of healthy foods as they can also serve as a means for consumers to purchase nutritious foods at an affordable price (La Trobe 2001, 189), thereby enhancing the opportunities for Health and Wellness.

Food Policy. Food policy represents the community government or municipality’s opportunity to strengthen the community food system through regulations, incentives, and legislation. There can be direct links with providing access and availability of healthy foods or developing incentives for community growing spaces, local food markets, and local food production. Food policy can serve as a leverage point for all of the above leverage points, thereby enhancing the achievement of all the satisfiers defined in our analysis. This makes it a powerful tool for municipal governments in their efforts to satisfy Human Needs in communities.

Celebration of Food. Celebration of Food recognizes the opportunity to bring community members an increased Sense of Place. Community events, festivals, and gatherings showcasing local foods or showing appreciation for growers and harvests are a few examples. Identity is actualized through food-related festivals or through other means such as the slow food movement by providing opportunities for Participation. This also provides strong support to local food production and food gathering places.
3.1.3 Satisfiers & Leverage Points Summary

Synergies between satisfiers and leverage points were common in our analysis. Many leverage points can lead towards multiple satisfiers, while the satisfiers also link to one another and provide opportunities for meeting multiple needs. Our CLDs (see Appendix B and Figure 3.1) show multiple connections existing between points and how the application of one leverage point can often lead to the reinforcement of another. The same is true of the satisfiers and of the Needs themselves. For example, we found that Participation and Identity were commonly associated with the satisfaction of the other needs.

Our results present a strong case for the ability of a community food system to provide opportunities to meet Human Needs. There is a multitude of ways in which this can be done, and our analysis has helped us to identify some key components that provide opportunities to drive the process. Identifying leverage points and satisfiers can aid in the development of strategies to create a CFS that meets the community goals of sustainability and the satisfaction of Human Needs.

3.2 Strategy Analysis

In order to develop strategies for the CFS, it is important to return to our definition of success. To achieve success as outlined in the Introduction the CFS must:

- Comply with the four Sustainability Principles (success in the biosphere)
- Provide opportunities to meet Human Needs
- Meet a further description of success that might be put forth for the CFS

With an understanding of success in the CFS, we can move on to enumerate strategies.
3.2.1 Systems Analysis Strategies

Through our own analysis, we identified eight leverage points as areas in which strategies can be created to guide CFS development. Strategies could also be developed for the generic satisfiers. However, because these satisfiers are not exclusively influenced by the community food system, they are perhaps better considered as a community strategy. Communities can develop strategies around these leverage points in order to support the satisfiers. Recapping from 3.1.2, we have identified the following eight leverage points that can serve as areas around which a community might develop a strategy:

- Access & Availability of Healthy Foods
- Food Education
- Food Gathering Places
- Community Food Growing Places
- Local Food Production
- Local Food Markets
- Food Policy
- Celebration of Local Food

3.2.2 Community Strategy Analysis

Our review of food system planning and strategy documents from the three community/regions (Bella Coola Valley, Dane County and Broadland) in our study and the two comprehensive reviews (Vivid Picture and the University of Michigan’s Action Plan for Washtenaw County) also produced a list of strategies. Each source was unique in outlining goals, priority areas, and actions for the final plan or strategy document. However, there was significant overlap of both general ideas and specific actions between communities. We compiled a list of all actions and strategies identified in these sources into one table to avoid duplications and anomalies. (See the complete table with actions in Appendix C). The strategies identified through this process are:

- Ecosystems & Awareness
- Access to Nutritious Food
- Participate & Celebrate
3.2.3 Summary of Strategies

Comparing the strategies employed by other communities with the strategies that we have arrived at with our systems analysis may provide some food for thought\textsuperscript{10}.

Similar Strategies. We found four strategies in our systems analysis that were very similar to those identified in the community strategy analysis:

<table>
<thead>
<tr>
<th>Strategies from Communities:</th>
<th>Strategies from Systems Analysis:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Nutritious Food ...................</td>
<td>Access &amp; Avail. of Nutritious Food</td>
</tr>
<tr>
<td>Participate &amp; Celebrate .....................</td>
<td>Celebration of Local Food</td>
</tr>
<tr>
<td>Policy .....................................</td>
<td>Food Policy</td>
</tr>
<tr>
<td>Education ..................................</td>
<td>Food Education</td>
</tr>
</tbody>
</table>

Strategy became Satisfier. Some strategies developed by communities seem to be more appropriately labelled as satisfiers. These strategies are significantly broader in scope than the community’s food system, and therefore we suggest that it not be a focus of a strategy for implementing a CFS. These include:

<table>
<thead>
<tr>
<th>Strategies from Communities:</th>
<th>Satisfier identified by us:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecosystems &amp; Awareness .....................</td>
<td>Ecological Awareness</td>
</tr>
<tr>
<td>Networks &amp; Alliances ........................</td>
<td>Community Relations</td>
</tr>
<tr>
<td>Regional Identity ...........................</td>
<td>Sense of Place</td>
</tr>
</tbody>
</table>

Note that these satisfiers included in our analysis suggest that there are leverage points (that can be turned into strategies) to address these satisfiers. We are not suggesting that the strategies proposed by other

\textsuperscript{10} Pun intended.
communities are not important, but rather that they are bigger than the food system and could be enhanced by other community systems as well. As such, they should not be considered strategic areas to pursue in the development of a community food system, but instead should be strategic areas at the community level in the community’s pursuit of providing satisfiers for Human Needs. If these are maintained as strategies for the CFS, collaboration with other relevant community systems is a minimum requirement.

**Different Strategies.** Three strategic areas that were common among the communities we reviewed are ‘local economy,’ ‘ethics and social justice,’ and ‘infrastructure.’ These did not appear in our list of strategies.

Regarding ‘local economy’ as a strategic area—we believe that the economy should not be a focus area. When a strategy is developed around the economy, the economy becomes the focus; this takes focus away from the vision of success: opportunities to meet Human Needs and compliance with the SPs. Instead, by focusing on other aspects of building a community food system, the economy will be strengthened as supposed by Feenstra and Garrett (1999, 3): “communities gain opportunities to strengthen their social and economic health by creating meaningful jobs and re-circulating social and financial capital locally.”

‘Ethics and social justice’ is inherent in the fourth sustainability principle (not systematically undermining people’s capacity to meet their needs). While this fourth principle does not elaborate on how to address ethics and social justice, the principle does lay a foundation to focus on the topic. Therefore, we suggest that ethics and social justice are included in the definition of success, and as such should not be (or be confused with) a strategy. Simply, all of the strategies we suggest for the CFS should be directed toward ethical behavior and social justice, but ethics and social justice are not strategies themselves.

We addressed many aspects of community food system ‘infrastructure’ at a higher level by focusing on strategies that require significant infrastructure to implement. Therefore, we see many components of ‘infrastructure’ as part of the actions level of the 5LF. For example, creating community gardens or developing cooperative distribution systems are possible actions to implement some of our strategies.
3.3 CFS and Sustainability Principles

Feenstra and Garrett’s definition of CFS includes the term ‘sustainable,’ and in this paper refers to compliance with the Sustainability Principles. By providing constraints of what cannot be done, the SPs create an opportunity for a creative vision to be developed for the CFS. The focus of this project has been to show how to develop a CFS that places the meeting of Human Needs and compliance with Sustainability Principles within its definition of success.

The FSSD is helpful in outlining a process to plan strategically. In creating strategy areas to move towards success of the CFS, it is important that all actions developed to support these strategies also move towards the same definition of success (opportunities to meet Human Needs and compliance with Sustainability Principles). Strategy developers should keep in mind that each of the strategy areas, when developed using backcasting, can be effective in creating actions that move a community food system towards its vision.

There are a myriad of options for further developing the strategy areas we have outlined for a CFS in order to move it towards compliance with the SPs. Most obvious, perhaps, is in how food is produced: large amounts of non-renewable fossil fuels used to prepare fertilizers and herbicides goes against the first Sustainability Principle. Instead, less resource-intense growing methods need to be utilized. Following from the second Sustainability Principle, chemicals foreign to nature that systematically accumulate cannot be used as herbicides or insecticides. Nutrient cycles are an important consideration with regard to the third Sustainability Principle: to be sustainable, growing practices must consider how nutrients can be returned to the soil so that soil quality remains consistent over time. People who produce the food must not have their needs systematically undermined, per the fourth Sustainability Principle.

As with food production, there are many considerations to be made with regard to other aspects of a CFS. For example, the current food distribution network in North America (of both local and non-local food) is heavily dependent upon fossil fuels; this is unacceptable over the long-term per the first Sustainability Principle. Restaurants, as places where people gather to
enjoy food, must be built with sustainability in mind, i.e., low energy use (SPI), environmentally-friendly materials (SPII), low-impact footprint (SPIII), serve healthy foods (SPIV), etc.

While it is extremely difficult, probably impossible, to have a CFS that complies with all four Sustainability Principles at this time, it is important that these principles be considered in developing strategies for the CFS. An important tool for planning in this way is the ABCD process which encourages movement in the right direction, following a flexible platform, and providing an adequate return on investment so that strategies can be monitored and adapted as future opportunities present themselves.

3.4 Strategy Areas

Each of our eight strategy areas is described in detail below. Included are examples of specific strategies and possible actions. These actions are derived from the work of existing community food system strategies and are useful in providing concrete examples of ways the strategy areas could be implemented.

*Nutritious Food is Accessible & Available.* This is a broad area of strategy that aims to ensure nutritious food is available and that members of the community have access to it. This includes having sufficient quantities of nutritious and safe foods, food affordability, and the geographical availability of the food supply (e.g. market or grocery store locations).

A strategy could be: ‘ensure that nutritious food is available and accessible to all community members’ or ‘provide access to sufficient, nutritious, safe and affordable food for all community members.’

Possible Actions:

- Work with public planning to ensure that markets and food stores are geographically proximate to living areas and accessible by public transportation
- Address the issue of affordability by providing ways for people to grow some of their own fresh produce (see Community Food Growing Places below)
Begin a shared market town distribution system in which existing producers and suppliers will be able to access an ordering and distribution system supplying retailers and caterers in the market town and its hinterland (Broadland Food Strategy 2004, 13)

Start a gleaning program that makes gleaned fruit available to tree owners, pickers, and local food programs (Bella Coola Valley Food Action Plan 2006, 47)

Increase availability of organic, seasonal, local food

Food-Related Education. This strategy area suggests that a community provide educational outreach to its members. This may increase awareness of the importance and opportunities related to food. Focus could be on growing food, food preparation, or nutrition education.

A strategy could be: ‘increase educational opportunities for community members specifically related to health & wellness, growing food, and preparing food.’

Possible Actions:

Organize a programme of courses, cultural and educational events involving as wide a range of participants in the food supply chain as possible and aiming to include all parts of the community (Broadland Food Strategy 2004, 12)

Increase awareness of community kitchens and food safety programs (Bella Coola Valley Food Action Plan 2006, 48)

Work with schools to ensure nutrition education is from K-12 and includes cooking and [ecological, organic] gardening skills (Bella Coola Valley Food Action Plan 2006, 49)

Food Gathering Places. This strategic area relates to a community providing places for people to gather around food, e.g., restaurants, picnic areas, or public kitchens. These places provide opportunities for the satisfaction of Human Needs directly, and also foster several other strategies. Ideally these places take advantage of local food.

A strategy could be: ‘encourage and support places that provide community members the opportunity to gather around healthy food.’

Possible Actions:
Encourage restaurants (especially locally-owned) through appropriate means, e.g., tax breaks, advertising, or holding weekly meetings at the restaurant

Provide access to facilities so that community groups have access to a place where they can gather to prepare and share meals

Keep park facilities such as grills, restrooms, and picnic tables in an attractive and working condition

Easily accessible by public transportation, bicycling or walking

Source food locally, seasonally, organically

**Community Food Growing Places.** This strategic area involves providing opportunities for people to grow their own food and encouraging the utilization of these food-growing places to enhance satisfiers of Human Needs.

A strategy could be: ‘create community gardens and agricultural facilities’

**Possible Actions:**
- Support and provide community growing places that encourage ecologically sound growing practices
- Ensure that policy allows and supports rooftop gardens
- Ensure that land-use policy does not unnecessarily restrict growing food or raising poultry/livestock

**Local Food Production.** This strategy area encourages and supports local food production as a key component of the local food system. Local production can empower actors and agendas at the community level, and includes both the harvest of the full-time farmer as well as that of the weekend gardener. It also brings food sources closer to eaters, allowing for the benefits that come from an increased awareness of food.

A strategy could be: ‘encourage and support crop diversity within local food production.’

**Possible Actions:**
- Ensure that local production is ecologically and economically viable by supporting the purchase of local products
- Support local branding
- Encourage local ownership
Ensure that policy does not prohibit local production
Test soil in the area so that farmers and gardeners will know what their soil need for optimum growing (Bella Coola Valley Food Action Plan 2006, 49)

Local Food Markets. This strategic area ensures that local producers have a market available for selling their produce and community members have access to purchasing it.

A strategy could be: ‘create local food markets to ensure that producers have a market to sell and community members have access to purchase local goods.’

Possible Actions:
♦ Conduct local, seasonal, organic campaigns
♦ Ensure that institutional food policy is supportive of the local food system and encourage restaurants and schools to use locally grown food (Simpson 2007)
♦ Provide grants to start community-supported agricultural programs
♦ Work with Farmer’s Market Alliance to further develop program ideas and an appropriate organizational structure (Dane County Food Council Annual Report 2006, 7)
♦ Facilitate the creation of farmer’s markets (Dane County Food Council Annual Report 2006, 7)
♦ Support cooperatives and natural food stores

Food Policy. This strategic area involves reviewing policy that affects the community food system, as municipal codes often unnecessarily restrict food-related activities or lack incentives to strengthen regional food system development.

A strategy could be: “uphold or update policies related to food” or “create polity that encourages the local production, processing, and distribution of food.”

Possible Actions:
♦ Support producers in transitioning to and maintaining organic growing methods
Explore the possibility of planting fruit trees along streets, community gardens and parks (Mendes 2004, 11)
Establish a food procurement policy that promotes purchase of food from the community food system
The current bylaw prohibiting beekeeping in the city will be reviewed and beekeeping in other municipalities will be researched (Mendes 2004, 11)

_Celebrate Local Food_. This strategic area is about a community taking pride in food grown regionally by creating opportunities to celebrate those foods. Annual harvest festivals and cultural events are ways this strategy might be implemented. Also, finding ways to cherish food on a more regular basis can be fruitful.

A strategy could be: ‘promote events that celebrate food that is grown in our local area.’

Possible Actions:
- Support zero-waste cultural food events
- Enhance people’s gardening and cooking skills
- Draw upon the diversity of cultures within the community
- Promote opportunities for local organic production
- A community food festival that celebrates all aspects of food in the district (Broadland Food Strategy 2004, 12)
4 Discussion

Our results show how the development of community food systems can lead communities towards the realization of Human Needs and sustainability. Using systems analysis we were able to determine leverage points a CFS can use to create opportunities for satisfying Human Needs. Compiling data from several existing community food strategies to explore the application of our leverage points helped validate our conclusions. Using our systems analysis, the community strategy analysis, and an FSSD, we then developed strategy areas to guide communities in the process of developing a community food system that works toward sustainability and the satisfaction of Human Needs. The following chapter will be a further discussion of our primary research question which seeks to address how the development of CFS, using the FSSD, can be a strategy to move an entire community towards sustainability and the realization of Human Needs.

4.1 Limitations of our Analysis

The CFS is just one component of the complex make up of a community. We recognize that there may be obstacles to the realization of Human Needs through the CFS that we do not address in this paper. Other systems within the community may significantly impact an individual, both positively and negatively, as that individual is simultaneously influenced by all sub-systems of the community. In a community food system that is designed to meet all Human Needs, there are external influences that will affect the ultimate satisfaction of Human Needs for each individual. The community educational system or health care system may inhibit the need for Protection at the same time the community food system is supporting it. The results of this complicated interplay between community sub-systems and their effects on residents was not included in the scope of this study, and we recognize that these relationships deserve further examination in order to better understand the outcomes of developing a community food system based on the strategies we have developed.

The focus of our study was to examine the potential of a community food system to serve as a leverage point in moving towards sustainability and
realizing *Human Needs*. We recognize that, just as the CFS can create opportunities for positive change, there are always possibilities for negative impacts. This was not explored in our methods and we realize that by not exploring negative causality in our systems analysis our results are biased with optimism.

However, we feel that an encouraging aspect of developing CFS is nested within its potential. There are many other studies that explore the inhibitive and destructive realities of the current food system such as Drewnowski and Specter 2004; Horrigan, Lawrence, and Walker 2002; and Vitousek et al. 1997. In this study, we are trying to communicate an opportunity—a vision—that can be born out of the threats of our current reality. As many communities grapple with growing economic, social, and ecological stress we hope to inspire them to create their own optimistic vision of success to guide their community planning efforts.

### 4.2 A Shift towards *Human Needs*

The current global commodification of food can have a negative impact on a community’s ability to provide opportunities to both become sustainable and satisfy *Human Needs*. This system may provide us with energy-dense foods that meet our need for *Subsistence*, but at the cost of other important *Human Needs*. The current GFCS lacks a systems perspective that understands the need for sustainability. The GFCS is driven by fierce market pressure that puts economic gain at the forefront, where feeding people through the food system is reduced to a means of an economic end. However, if we remember the purpose of communities, we see that they are more closely aligned with serving people and providing opportunities for meeting *Human Needs*. In this light, the economy should be a means by which we can arrive at this purpose, rather than being the end goal. A healthy economy can work in cooperation with a community food system so that both create reinforcing loops to support one another, strengthening the whole community and its ability to meet *Human Needs*.

Developing community food systems is an effective strategy for communities to solve many of the problems created by the GFCS. Building the capacity of the community to provide food for its residents builds sovereignty and creates redundancies within the greater food system.
(Vergunst 2001, 2). If the food supply in one area of the world is compromised, stronger community food systems can help communities cope with an unexpected reduction in food supplies. Internalizing the food system at the community level is also effective in implementing an upstream perspective that considers environmental and social impacts to avoid ecological pitfalls and social inequities, while simultaneously providing opportunities for the economy to grow within the community.

Our analysis shows how the strategy areas developed can elicit the potential of the CFS. Increasing access and availability of nutritious foods together with food education creates opportunities for increased health in the community and encourages individuals to make better decisions about the quality of food they are purchasing. Local food celebrations, food gathering places, and local food markets allow people to build healthy relationships with neighbors. Connecting people to their food source can inspire a sense of place and ecological awareness (Levkoe 2006, 89), which can further emphasize responsibility, communication, and stewardship of the environment (Kloppenburg et al. 2000, 184).

The CFS introduces an element of proximity that is often missing from the current food distribution paradigm (Kloppenburg et al. 2000, 182). Increasing local capacity for food production, processing, marketing, distribution, and consumption can foster local ownership and accountability within the food system. As people become more connected through food to the physical place and community where they live and work, it becomes easier to understand the impacts as well as the opportunities of the community food system. Enhanced connectedness with the food supply has been shown to foster a greater sense of civic responsibility and well-being (Cone and Myhre 2000, 196).

### 4.3 Community Food Systems and Sustainability

The industrial eater ... no longer knows or imagines the connections between eating and the land. When food, in the minds of eaters, is no longer associated with farming and with the land, then the eaters are suffering a kind of cultural amnesia that is misleading and dangerous. We have neglected to understand that we cannot be free if our food
and its sources are controlled by someone else. The condition of the passive consumer of food is not a democratic condition. One reason to eat responsibly is to live free. (Wendell Berry 1989)

Our results illustrate how community food systems can foster awareness and a sense of responsibility within the community. We will discuss how this can influence society as it works towards sustainability. As the community food system provides opportunities for people to engage with one another and learn about their physical environment and culture, a sense of place is developed. Relationships between people, the community, and the biosphere become clearer. These relationships can communicate the cyclical nature of ecological systems.

4.3.1 Ecological Cycles and the CFS

Because the GFCS is spread over a large geographical area, the natural cycles of food production have become nearly linear; outputs of organic wastes from one area are rarely cycled back to supply nutrients to the system from which they came. Instead, production is dependent on fossil fuels, a non-renewable energy source, to fertilize crops. Some areas are stripped of essential topsoil, while others are destroyed by the excesses of agricultural waste. There is little balance.

An individual in a community can remain almost blind to this when they routinely purchase food items that maintain the same flavor, and come meticulously wrapped in the same packaging. Knowledge of where our food comes from and where it goes once we have consumed it helps build an understanding of ecological systems, especially those to which we are most connected. A community food system contrasts the GFCS by simplifying the complex system of global marketing, processing, packaging and selling into a tightly knit web of community members that are directly linked to one another (Hendrickson 1997, 46-48). Vergunst (2001, 4) suggests that the global scale makes the GFCS appear linear to an individual, whereas the cyclical reality is more apparent in a CFS: “In local food systems feedback flows are much richer, and can be characterized as cyclic instead of linear.”

As an individual begins to understand the cyclical nature of the CFS, the cyclical nature of all ecological systems becomes easier to understand. The
ability to communicate ecological awareness to individuals within a community is an encouraging possibility that arises through the CFS. It should be emphasized wherever possible, especially when developing strategies in the areas of food education, celebration of local food, and local food markets.

The connections between ecological awareness and opportunities to meet Human Needs are encouraging because they are often reinforcing of one another. Eating local seasonal favorites year after year can build affectionate nostalgia, while Participation in the cultivation of food teaches the importance of soil nutrition and how wastes can be recycled into compost to enrich the soil. Designing community strategies to create community food growing places such as community gardens provides excellent opportunities for residents to experience these benefits.

4.3.2 Human Needs and Sustainability

The community food system can provide opportunities for meaningful employment, bolstering community resilience, and promoting health and wellness. However, the CFS will not be able to sustain these satisfiers if it is simultaneously destroying the land it depends on to cultivate crops. The interdependence between the environment and the community is evident in the CFS because individuals routinely interact with the landscape that produces their food and with the farmers who grow it.

If a CFS is to work towards the realization of all nine Human Needs then it should simultaneously work towards compliance with all four sustainability principles. It is not enough to satisfy the needs of today; communities must also keep in mind the children and growing population that will demand access to resources in the future. A key aspect of the Sustainability Principles is that they address “systematic increases” of non-renewable resources or impacts on natural systems. Society will always use resources from our environment to sustain us and meet our needs. However, this can be done in a way that maintains the health of our environment so that it can continue to support our communities in perpetuity. If society continues to physically destroy habitats (SP III) and systematically introduce harmful substances that contribute to the degradation of ecosystems (SP II), we are hurting our own capacity to live healthy lives (SP IV). It is unreasonable to continue to base the GFCS on elements that we are systematically
increasing in our atmosphere, as is the case with emissions of carbon from burning fossil fuels (SP I).

Often, it is said that what is happening in our own backyards is easier to understand than what is happening across the world. Global problems can raise awareness and inspire action; however, change is often most effectively initiated at the local level. Individuals typically feel more empowered to influence policy at the community level than at the national or global level. The CFS can be used as a powerful tool to implement change locally because it fosters so many direct connections between individuals and their communities. Fostering connections between individuals and “place,” builds the realization that "what is good for us, or more precisely for our future generations, becomes largely indistinguishable from that which is good for life on earth" (Lockwood 1999, 368). So, for communities working towards sustainability, the development of a CFS can be a valuable leverage point.

### 4.3.3 The Role of Diversity

The eight strategy areas that we have outlined share some important commonalities, such as the building of personal relationships within the community through collaboration, communication, and appreciation. *Celebrations of local food* bring people together. Developing a local food system through *local food production*, processing, and *local food markets* requires cooperation among community members and businesses (Feenstra 1997, 6). Incorporating nutritious foods into community members’ diets can unite educational and food marketing initiatives. In each situation, a diverse group of stakeholders is formed. Networks are built and new friendships develop to strengthen the social fabric of the community.

Similar to the diverse networks of social systems formed in developing a CFS, there is also a need for the protection of biodiversity to reach sustainable agriculture. A community must respect its environment and work towards the health of both its residents and its ecosystems. A biologically diverse agricultural system can bring even greater sovereignty to the community by enhancing the resilience of its food supply through pest control, soil fertility, topsoil retention, and pollination (Millennium Ecosystem Assessment 2005, 12).
Because of the inherent desire of the CFS to maintain healthy ecosystems, ecological agriculture techniques should be encouraged. Integrated pest-management favoring biological methods such as crop rotations or intercropping can eliminate the need for harmful pesticides while soil management techniques that encourage beneficial bacteria and insects and maintain healthy nitrogen levels can replace the application of chemical fertilizers and stimulate micro-nutrients in the soil that feed plants and animals (Horrigan, Lawrence, and Walker 2002, 452).

**4.3.4 Local as a Means, not an End**

Our resulting strategies frequently refer to *local* as an important aspect of community food systems. However, *local* is not the ultimate end to pursue with the CFS so it is important to not get caught in the *local trap*.

*The local trap refers to the tendency of food activists and researchers to assume something inherent about the local scale... the local trap is the assumption that local is inherently good... *no* matter what its scale, the outcomes produced by a food system are contextual: they depend on the actors and agendas that are empowered by the particular social relations in a given food system.* (Born and Purcell 2006, 195-6)

*Local* is important, however, when developing a community food system that is focused on providing opportunities to meet *Human Needs*. *Local* allows—even encourages and sometimes requires—relationships and interactions that do not happen, at least not on a personal level, on the global scale. These relationships are fundamental to the satisfiers of *Human Needs*. One example related to the satisfier of *Healthy Community Relations* emerges through “the flows of information and immaterial feedback flows between producers and consumers … and the importance of trust [that] can be perceived as the emergent properties of local food systems” (Vergunst, 2001, 8).

*Local* can also be an important aspect communities consider in developing strategies to comply with Sustainability Principles, since it can result in a less exhaustive use of resources. In this case *local* is used as a means to work towards the end goal of sustainability by decreasing exhaustive transportation of materials and the ecological footprint that results.
However, it is not the case that local is always the best choice when prioritizing decisions concerning sustainability planning. ¹¹

A CFS does not require a community to abolish its dependence on the GFCS; instead, it strengthens community resilience. If a community is entirely dependent on external sources to ensure its access to food, then it becomes vulnerable. A CFS will give the community more options in responding to negative impacts created by the GFCS. Successes achieved in the CFS can also serve as an example to illustrate how the global food systems can be changed to better serve society. New partnerships between the global commodity system and local economies can emerge.

4.4 Synergistic Effects of the CFS

The community food system is nested within the greater community system that is a part of society existing within the biosphere (refer to Figure 1.8). Our research has shown that as a sub-system of a community system, the CFS can be designed to impact the entire community system, i.e., it can be used as a strategy to move the community towards sustainability. Since no system exists in isolation, a systems perspective includes the interactions between various sub-systems and nested systems.

Our CLD diagrams illustrate the profound impacts the CFS can have on the entire community and highlight direct connections between the CFS and many other community subsystems. Everyone must eat, and most of us do this at least three times a day, so individuals interact with the food system in their homes, at their jobs, and in their leisure time. Creating a change in the food system, then, has the potential to ripple through other components of the community, influencing the entire community system.

The background research informing our study was directed towards the development of sustainable food systems, for both communities and for society as a whole. However, as our research developed we realized that because there are so many inter-relationships occurring on many levels

¹¹ The ABCD process in Section 2.2.2 can serve as a useful tool for prioritizing actions towards sustainability and is explained in more detail in (Ny et al. 2006).
within the system of the planet, it is impossible to have a truly sustainable food system if the greater systems in which it is embedded are not also sustainable. A community food system cannot be sustainable if the community is not sustainable, just as the community cannot be truly sustainable if the whole of society is not. Yet all these systems can work towards sustainability and food systems can make important connections between the nested systems of society.

The CFS is capable of encouraging cooperation and strengthening connections between all community sub-systems, therefore impacting the entire community. This pattern of influence is illustrated by the figure below:

![Figure 4.1. Ripple Effect Influences. The small darkened circles represent sub-systems within the community system. The impacts generated by each can ripple outward to affect others within the community. The community food system has the potential to create a large ripple throughout the community (Figure adapted with permission from David Armano).](image-url)
Community restaurants provide a simple example. Restaurants create a means of employment for individuals. They also depend on municipal transport systems to ensure the delivery of their food supply, which supplies even more jobs for the community. The restaurant is dependent on other community businesses and individuals to supply it with building materials, supplies, and even art to create ambiance. Many different people visit the restaurant and have the opportunity to interact with people representing many other subsystems of the community. In working towards sustainability and the satisfaction of Human Needs, a community could develop a food gathering places strategy to emphasize partnerships between local food suppliers (supporting local food production) and local food markets. This encourages economic support for all three areas and creates more opportunity for strategy development. Food policy can also play an instrumental role in linking together community business and political efforts to work towards common goals.

A promising strategy area for beginning the development of a CFS is in local food production. This area creates the need for other components of the community food system, such as local processing facilities and means for distribution. This can generate revenue and jobs for the local economy, providing opportunities for Subsistence and Identity to be met. An increase in the supply of locally produced food can also stimulate more active participation from within the community to engage in local trade. Markets and restaurants may develop to support this food supply, strengthening the availability of nutritious foods and opportunities for Protection and Creation. Residents learn about the locality and seasonality of their diets and build Understanding and more Identity. The farmer participates in the same community as his consumers, and relationships are built to foster the satisfaction of Human Needs for even more individuals.

Other strategies for developing a community food system reinforce one another as well. Creating food education programs will enhance opportunities for health and wellness and can also build support for the development of community food growing places. These relationships can form positive feedback loops such that as one is strengthened the other is also positively influenced (see Figure 3.1).

The sense of place that is built through the CFS can lead to the desires of residents to further explore how their own lives are impacted by community
systems. If an individual meets one *Human Need*, a satisfier to another is often elicited. If the community food system aids this individual in meeting his/her needs, he/she most likely will have a similar ripple effect on other individuals in the community. So, even the smallest impacts of the CFS can have wide-reaching effects.

4.4.1 The Community and Beyond

The ripple effect can be expanded out to the macro scale and the same argument used to discuss the potential for communities using SSD to have an increased influence that ripples out towards other communities, eventually affecting all of society. The ripple effect influence diagram (see Figure 4.1) could also be used in the context of society as the system, with the ripples representing various communities existing within society. If the CFS can work in conjunction with other sub-systems within the community then the possible outcomes are even greater. Cross-sector synergies between the food system and other community sectors should be identified and encouraged. The same logic also applies at the macro scale. Communities can network and build relationships with other communities; they may then have greater lobbying power for influencing regional and national policies that is often cited as barriers to the development of CFS (Simpson 2007).

4.5 From Theory to Practice

The vision of success that we have presented for communities, although comprehensive, does not capture the beautiful diversity that exists among communities. Each has its own identity and may differ in core values and purpose. Each community can define its own vision of success, and create additional strategic goals and values to complement the realization of *Human Needs* and compliance with the Sustainability Principles. when applying a backcasting approach. A compelling vision that is designed by community members provides a more unifying platform for a community. It is the bringing together of diverse stakeholders and for the participatory role of co-creation that brings energy to the process of creating community food systems and is essential in bringing efforts to fruition (Kneen 2007).
The development and prioritization of actions to meet strategies is also a process that is specific to each community. Our strategy areas and vision of success can help guide actions, but we recognize and appreciate that each list of actions will be different. The framework for strategic sustainable development and ABCD planning process can help communities identify actions and additional strategy areas to move towards success. The process of prioritizing actions and strategies is an important consideration that is dependent on each community’s situation and resources. The strategy areas we have provided are not meant to be implemented in any particular order, but individual communities may choose to prioritize measures based on their current situation.

Backcasting from sustainability principles and the satisfaction of *Human Needs*, is a useful method for determining if strategies and the actions to implement them are headed in the right direction. We also recommend that communities make efforts to learn from others who are building community food systems. Creating community networks and regional alliances can strengthen individual efforts. Collaborative development of community food systems will only widen the ripple on society as communities work towards sustainability and the satisfaction of *Human Needs*.

The community food system can be a key leverage point for any community. People and food will always be closely linked to one another. Perhaps even more significant, the CFS has the potential to enhance the connections between residents, fostering community participation and the willingness to create positive change. We need to embrace and cultivate this connection as we attempt to move our communities into a sustainable future.
5 Conclusion

Community strategies that work within the constraints of the Sustainability Principles incorporate efforts to not undermine the ability of people to meet their needs (SP 4). Moving beyond not inhibiting Human Needs to providing opportunities for all residents to meet these Human Needs can provide a more meaningful definition of success and lead to the creation of a compelling vision. The inclusion of Human Needs at the level of success also incorporates the ambitions outlined in municipal charters which can further engage communities in the process of outlining goals to achieve their vision. The community food system, as a component of the community system, can be designed to work towards these same goals.

Our research has found that the community food system can provide many opportunities to meet Human Needs. There are a variety of leverage points within the CFS that can stimulate general satisfiers to Human Needs:

<table>
<thead>
<tr>
<th>Leverage Points:</th>
<th>Satisfiers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ Local Food Production</td>
<td>♦ Health &amp; Wellness</td>
</tr>
<tr>
<td>♦ Community Food Growing Places</td>
<td>♦ Healthy Community Relations</td>
</tr>
<tr>
<td>♦ Access and Availability to Nutritious Foods</td>
<td>♦ Ecological Awareness</td>
</tr>
<tr>
<td>♦ Local Food Markets</td>
<td>♦ Community Resilience</td>
</tr>
<tr>
<td>♦ Food Gathering Places</td>
<td>♦ Meaningful Employment</td>
</tr>
<tr>
<td>♦ Food Education</td>
<td>♦ Sense of Place</td>
</tr>
<tr>
<td>♦ Food Policy</td>
<td>♦ Opportunities for Expression</td>
</tr>
<tr>
<td>♦ Celebration of Food</td>
<td></td>
</tr>
</tbody>
</table>

The framework for strategic sustainable development provides a useful structure for interpreting our research. It is a useful tool that can guide the process of strategically planning for community food systems. It is also best suited to incorporate the practical application of our findings into the development of a CFS.

Awareness of the system is an important component to any development process. The CFS is part of a very complex network of community
components and is continuously influencing other community systems. The community system also creates impacts that can affect society, which, in turn, is in constant interaction with its parent system, the biosphere. The multitude of interconnections between systems highlights the potential for collaboration. In working towards similar goals, communities can align strategies and build alliances to strengthen resources and build capacity.

The definitions for success should always include compliance with all four Sustainability Principles. Adding the meeting of Human Needs to this definition can lead to the creation of a more compelling vision and also reinforces compliance with the SPs. In order for communities to meet HN, they must consider today’s generations, as well as tomorrow’s. Community food systems are dependent on healthy ecological systems to ensure safe, nutritious foods to meet the needs of community residents. The CFS must be designed to be compliant with the first three Sustainability Principles if it seeks to provide opportunities to meet HN.

There are many other goals that the CFS can aspire to and communities are encouraged to develop additional ways to define success. All definitions of success must be considered when moving to the next level of developing strategies. Our recommendation to communities is to use methods that incorporate backcasting from Sustainability Principles to guide the strategy development process. Rather than focusing on where we are today, and carrying the problems associated with current food systems into the future, it is more important to have a clear vision of where we would like to go, so that we can better design strategies to lead us there. We have outlined eight strategy areas that could be useful for communities developing a CFS to provide opportunities to meet Human Needs and comply with the Sustainability Principles:

- Local Food Production
- Local Food Markets
- Celebration of Food
- Access and Availability to Nutritious Foods
- Food Policy
- Food Education
- Food Gathering Places
- Community Food Growing Places

These strategy areas can provide CFS developers with important insight to guide the creation of successful community food systems. There are many synergies existing between strategy areas, and actions developed in one can often serve to enhance others and may stimulate other components within
the community system, ultimately leading towards key satisfiers of *Human Needs*. The strategy areas we have outlined are general in scope and we encourage communities to engage in collaborative planning processes to customize strategy areas to best suit their community. The action and tools level of the FSSD are used to guide the process of implementation of strategies. Tools can be used to facilitate system awareness, build capacity, and can measure and monitor progress to ensure that projects are consistently moving in the right direction.

There is an encouraging potential that emerges in the development of community food systems. Fostering personal connections between individuals and their food builds understanding through social and ecological awareness. Understanding is the first step in initiating behavioral change and the CFS can build this capacity at the local level. Communities should not overlook this potential and encourage the development of community food systems that work towards sustainability and provide opportunities to meet *Human Needs*. The capacity for change is only strengthened as communities collaborate with one another to strengthen regional, national, and global food systems. In this way, the potential of the CFS can ripple further out into society, building more and more of the necessary connections that can lead society towards a sustainable future where everyone’s *Human Needs* are met.
References


Holmberg, John., U. Lundqvist, Karl-Henrik Robèrt, and M. Wackernagel. 1999. The Ecological Footprint from a Systems Perspective of


Lakoff, George. 2006. Strategic Initiatives.


Lidstone, Donald. 2005. The model municipal charter. Vancouver, BC.


Robèrt, Karl-Henrik. 2006. Strategic Leadership towards Sustainability. Figure taken from a slide presentation given August 31, 2006 at Blekinge Tekniska Högskola, Karlskrona, Sweden.


Vergunst, Petra. 2001. The Embeddedness of Local Food Systems. Royal Veterinary and Agricultural University, Copenhagen, Denmark.


## Appendix A. Human Needs Matrix

<table>
<thead>
<tr>
<th>Subsistence</th>
<th>Being (qualities)</th>
<th>Having (things)</th>
<th>Doing (actions)</th>
<th>Interacting (settings)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Physical health, Wellness</td>
<td>Nutrition, Energy/food</td>
<td>Physical activity</td>
<td>Healthy environment (land/water), community gardens</td>
</tr>
<tr>
<td>Protection</td>
<td>Physical health, Wellness, Resilience to disease</td>
<td>Nutrition, Food security, Food policy</td>
<td>Networking, Coalition/alliance building</td>
<td>Networks, Meetings/councils</td>
</tr>
<tr>
<td>Affection</td>
<td>Pleasure, Sensuality</td>
<td>Relationships with nature</td>
<td>Appreciating, Giving, Sharing, Growing/Cultivating</td>
<td>Kitchens, Restaurants, Gardens</td>
</tr>
<tr>
<td>Understanding</td>
<td>Ecological awareness, Systems awareness</td>
<td>Food policies, Procurement</td>
<td>Dev. of food system, Education, Meditating, Hunting, Learning</td>
<td>Food growing and gathering places</td>
</tr>
<tr>
<td>Participation</td>
<td>Physical health, Wellness</td>
<td>Nutrition</td>
<td>Hunting, Growing, Cultivating, Cooking, Eating, Learning</td>
<td>Food growing places, Food gathering places</td>
</tr>
<tr>
<td>Idleness</td>
<td>Curiosity, Imagination, Sensuality</td>
<td>Clubs</td>
<td>Cooking, Growing, Cultivating, Meditating, Slow food</td>
<td>Food growing places, Food gathering places</td>
</tr>
<tr>
<td>Creation</td>
<td>Diversity</td>
<td>Nutrition, Methods for growing</td>
<td>Cooking, Baking, Gardening, Design, Planning, Adapting to environment</td>
<td>Food growing and gathering places</td>
</tr>
<tr>
<td>Identity</td>
<td>Physical health, Wellness, Sense of place</td>
<td>Occupation, Employment, Customs</td>
<td>Festivals, Celebrations, (see creation)</td>
<td>Food growing and gathering places</td>
</tr>
<tr>
<td>Freedom</td>
<td>Autonomy</td>
<td>Food security</td>
<td>Developing awareness</td>
<td>Food growing and gathering places</td>
</tr>
</tbody>
</table>
Appendix B. Causal Loop Diagrams

B.1 Affection

B.2 Freedom
B.3 Creation

B.4 Identity
B.5 Idleness

- Idleness
  - slow food
  - ecological awareness
  - time spent gardening
  - community gardens
  - opportunities for expression
  - active lifestyle
  - health/wellness
  - access to healthy foods
  - peace of mind/tranquility

B.6 Participation

- Participation
  - interaction between producers and consumers
  - respect
  - food gathering spaces
  - sharing
  - community relationships
  - sense of place
  - food celebration
  - ecological awareness
  - consumer connection to food source

opportunities for expression
B.7 Protection

B.8 Subsistence
B.9 Understanding
Appendix C. Community Strategy Analysis

This appendix provides the reader with more information about our community strategy analysis. We compiled food system action and strategy plans from the following sources:

**Bella Coola Valley, British Columbia, Canada**

Bella Coola Valley Food Action Plan  
(available at http://www.centralcoastbc.com/ccrd/library/)

Contact:  
Bella Coola Valley Sustainable Agricultural Society  
PO Box 326  
Bella Coola, BC V0T 1C0

**Broadland Community Partnership, Broadland, UK**

Broadland Food Strategy (available at eafl.org.uk)

Community Plan and Action Plan 2004/05  
(available at www.broadland.gov.uk)

Contact:  
East Anglia Food Link  
The Street  
Long Stratton  
Norwich  
Norfolk NR15 2XQ
Dane County, Wisconsin, USA

Dane County Food Council Annual Report 2006
(available at http://www.countyofdane.com/foodcouncil/)

Recipe for Success: Recommendations of the Dane County Local Food Policy Advisory Subcommittee (available at www.countyofdane.com/foodcouncil/)
Contact:
Dawn Burgardt
210 Martin Luther King Jr. Blvd Rm 362
Madison WI 53703-3342


A master’s thesis by:

The Vivid Picture Project

The New Mainstream: A Sustainable Food Agenda for California
(available at www.vividpicture.net/documents/)

Contact:
EcoTrust
721 NW Ninth Avenue
Portland, OR 97209
The compiled list of actions and strategies is depicted below:

<table>
<thead>
<tr>
<th>ACTION</th>
<th>STRATEGIC AREA</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve distribution of local food</td>
<td>Ecosystems &amp; Awareness</td>
<td>Broadland</td>
</tr>
<tr>
<td>Improve food provided in schools</td>
<td>Access to nutritious food</td>
<td>Bella Coola</td>
</tr>
<tr>
<td>Encourage local production, processing, retail</td>
<td>Participate &amp; Celebrate</td>
<td>Dane County</td>
</tr>
<tr>
<td>Support cultural food events</td>
<td>Policy</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Promote healthy food choices</td>
<td>Regional Identity</td>
<td></td>
</tr>
<tr>
<td>Ensure local production is viable</td>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Support local and broader policy</td>
<td>Local Economy</td>
<td></td>
</tr>
<tr>
<td>Support local branding</td>
<td>Networks &amp; Alliances</td>
<td></td>
</tr>
<tr>
<td>Buy local campaign</td>
<td>Ethics &amp; Social Justice</td>
<td></td>
</tr>
<tr>
<td>Educational initiative of food in schools</td>
<td>Infrastructure</td>
<td></td>
</tr>
<tr>
<td>Enhanced food skills (cooking, growing, eating)</td>
<td></td>
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<tr>
<td>Expand food-related research</td>
<td></td>
<td></td>
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<tr>
<td>Promote healthy food choices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing support for local businesses</td>
<td></td>
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<tr>
<td>Alliance of local stakeholders</td>
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<td></td>
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<tr>
<td>Learn from other food initiatives</td>
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<tr>
<td>Spread local, ecological knowledge</td>
<td></td>
<td></td>
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<tr>
<td>Organize the stakeholder community</td>
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<td></td>
</tr>
<tr>
<td>Conduct activities so that resources allow production in perpetuity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local food markets</td>
<td></td>
<td></td>
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<tr>
<td>-----------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community-supported Agriculture (CSAs)</td>
<td></td>
<td></td>
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<tr>
<td>Shared market distribution system</td>
<td></td>
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<tr>
<td>Conduct a food system assessment</td>
<td></td>
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<tr>
<td>Local food purchase policy</td>
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<td></td>
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<tr>
<td>Hire a food system coordinator</td>
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<td></td>
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<tr>
<td>Implement food security programs</td>
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<tr>
<td>Network with other food system organizations</td>
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<tr>
<td>Create a regional food council</td>
<td></td>
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<tr>
<td>Facilitate entry for new food businesses</td>
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<tr>
<td>Encourage eaters to know about their food</td>
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<tr>
<td>Draw upon different food cultures in community</td>
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<tr>
<td>Support / increase biodiversity</td>
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<tr>
<td>Minimize food system input materials</td>
<td></td>
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<tr>
<td>Employ humane practices in animal care</td>
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<tr>
<td>Provide opportunities for value-added revenue on local farms</td>
<td></td>
<td></td>
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<tr>
<td>Promote local ownership</td>
<td></td>
<td></td>
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<tr>
<td>Promote efficient markets that share info &amp; proceeds equitably</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allow any business to participate as long as it uses sustainable practices</td>
<td></td>
<td></td>
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<tr>
<td>Education thru network of interested community groups</td>
<td></td>
<td></td>
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<tr>
<td>Labelling to identify local food</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web-based info on local food system</td>
<td></td>
<td></td>
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</tbody>
</table>