Organizational Networks as Catalysts for Strategic Sustainable Development

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Abstract:
In an increasingly connected and interdependent world, the global sustainability challenge needs to be addressed by organizational networks from a whole-systems perspective. This study explores organizations through the lens of network theory and the Framework for Strategic Sustainable Development, with a special focus on networks already considering sustainability issues. The purpose of the research was to identify key factors critical to the success of an organizational network in the sustainability field, as well as define specific barriers to success for these networks. These specific factors and barriers to success are identified and explored across: Academic, Business, and Non-Profit sectors, with the ultimate objective of increasing the performance of Emerging Sustainability Networks (ESNs), removing barriers in the field, and planning strategically to achieve success in the sustainability movement.

Keywords: Collaboration, collective intelligence, globalization, networks, organizational networks, social networks, sustainability, sustainable development.
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Statement of Collaboration

This thesis is a joint effort of three researchers throughout a six-month research study. Each researcher brought their unique perspective, strengths and humor to the process. The original thesis topic was inspired by a keen interest in the role that organizational networks play in the existing field of sustainability, and the study was subsequently supplemented by each group member’s professional and academic background.

Each researcher specialized in a sector of the field of sustainability in order to fully address network performance and increase group efficiency. All members reviewed and revised each other’s work, reaching consensus with a shared respect for strategic planning. Results were achieved with a combination of data gathering, synthesis of data, and processing of key findings in order to extract the highest quality discussion and results.

Our group shares a passion for sustainability innovation and thought leadership, a keen interest in sustainable academic, business, and non-profit networks, and unwavering belief in the potential of the field of Strategic Sustainable Development. We are unanimous in our conclusion that the experience of writing a group thesis yielded far stronger results than any individual attempt, and have thoroughly enjoyed the experience.

Karlskrona, June 2008

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Executive Summary

This document presents a distinct approach for shaping the evolution of large-scale change towards sustainability. Supporting research was completed as part of a thesis for the Masters Program in Strategic Leadership towards Sustainability at the Blekinge Institute of Technology in Sweden. A research approach was developed as a combination of network theory and the Framework for Strategic Sustainable Development (FSSD), and includes an analysis of organizational network efficiency and performance as related to the field of Sustainable Development.

Research Context

This study explores innovative organizing models with a focus on sustainability-related networks. “The stakes are high. Networks can help to change the unsustainable status quo for the better, by responding to the challenges and taking full advantage of technological change and economic and social integration” (Reinicke et al 2000). As Secretary General of the United Nations Kofi Anan commented, “This partnership of NGOs, the private sector, international organizations, and governments…is a powerful partnership for the future.” (Reinicke et al 2000)

Why is it so critical to understand network behaviors and dynamics on a global scale? Complex issues such as climate change act in a distributed fashion around the planet with differing impacts in every place. Depending on the region, different variables can be contributing factors. As a result, local and national organizations have been creating networks to take action against sustainability challenges within their existing environments. When looking at the source of the problem, such as to a threat like climate change (i.e. global anthropogenic increases of atmospheric greenhouse gases), resulting action must be taken at a global level to achieve the desired results.

Local network activity needs to have an understanding of its influence on the whole system to avoid the possibility of creating negative impacts on other regions. For instance, a local network for bio-fuel development needs to be aware that its actions may adversely affect the availability of food in other regions. The following describes a six-month research study addressing this very challenge.
Research Objective and Questions

This study explores organizational systems through the lens of network theory and FSSD, with a special focus on sustainability-related networks. Research addressed the following primary question:

- Backcasting from a sustainable society, how can organizational networks effectively catalyze change for Strategic Sustainable Development?

The purpose of the research was to identify the ‘internal’ factors critical to every organizational network’s success in the sustainability field; and determine their main ‘external’ barriers impeding networks across the field of sustainability. These internal and external variables are identified and explored across: Academic, Business, and Non-Profit sectors, with the research intent to increase the performance of Emerging Sustainability Networks (ESNs) and remove barriers to success in the field.

Methodology

The research methodology for this thesis can be described as exploratory, qualitative research. Research methods included: literature reviews, interviews with leading sustainability experts and organizational leaders, action research, case studies, analysis, and discussion. This research builds upon a strategic approach to sustainable development, addressed here as the Framework for Strategic Sustainable Development, which uses backcasting from sustainability principles.

Results

Two stages of interviews were conducted with thirty-seven people during the research period. Interviews with thought leaders gave the study its primary findings. Phase I of the interviews tested for critical success factors within networks in the field of sustainability. Nine internal factors were identified as critical: Vision, Leadership, Resilience, Capacity, Engagement, Network Structure, Communication Tools, Positioning and Leverage in the field, and Network Diversity. Eighteen individuals were interviewed during Phase I.

An additional nineteen interviews were conducted in Phase II. External network barriers to success and potential solutions to aid movement towards a sustainable society were explored. Organizational networks in the
field of Sustainable Development were polled on the local, regional, and international level. Three main barriers were identified as the existing challenges facing these networks today. These included:

1. **Awareness** of the network’s position and function within the biosphere and the field of sustainability,

2. **Adherence** to a shared language of sustainability that is both understood and implemented into the networks’ purpose and function, and

3. **Collaboration** with other networks in the field to effectively drive systematic sustainable change.

**Discussion**

**Supporting the Field as a “Network-of-Networks”**

The field of Strategic Sustainable Development has the potential to optimize organizational network behavior towards a sustainable society. Organizations acting as early adopters, that use a whole-systems framework like Strategic Sustainable Development, will likely have the greatest potential to catalyze a movement for global systemic change.

Organizational networks functioning with a common framework have the capacity to incur geographic and cross-sector network interactions that respond to global sustainability challenges. This creates the conditions for organizational network collaboration, which can support the field of sustainability as a global network-of-networks.

**Awareness within the System**

Research results have shown that the first major factor influencing a network’s success to drive systemic sustainable change is the capacity to integrate a whole-systems and cross-sector perspective of the field, embodying self-awareness within its societal context. As mentioned, for complex issues such as climate change, a whole-systems awareness is the only way to effectively deal with the problem.

By mapping its links, nodes, and network hubs, an organizational network can visualize its relationships. This knowledge can help networks understand information flows, strategic positioning, and opportunities for
collaboration. It can also identify weaknesses and efficiency gaps. Once gaps have been addressed and network optimization with a whole-systems perspective is reached, an organizational network is best equipped to collaborate with other networks to pursue a common goal of sustainability.

**Shared Definition of Sustainability**

An absence of a shared language for sustainability based on scientific principles was a large barrier to success in the field. Without a common definition of sustainability from which to work from, our society cannot expect much success in attempting to mitigate damaging anthropogenic processes in the biosphere. By implementing a whole-systems strategic planning methodology, organizational networks in the field can ensure a shared definition of success and progress effectively.

Shared language can help to communicate best practices, and bridge the divides between differing industries and sectors. This provides the best opportunity for consensus to be reached and movement towards a global response to the sustainability challenge.

**Collaboration Across the Sustainability Field**

The largest barrier to achieving systemic change throughout this study was a lack of capacity to collaborate with other organizational networks across the field. Collaboration, or ‘functional interdependence’, whereby organizations mutually benefit by working together, needs a proactive effort towards interdependence and would be a benefit to the field. For example, the non-profit sector has a wide gap between organizations addressing societal issues such as poverty and public health; and organizations addressing environmental issues like biodiversity and natural resource conservation. Both social and ecological issues are interdependent, yet at times these specific organizations do not interact. When perceiving sustainability from a whole-systems perspective, this link becomes evident and a common framework can best help to bridge this gap.

Opportunities exist to engage and organize practitioners across industries to converge around sustainability challenges. Problem-centered entities are often quite successful when engaging diverse stakeholders. It is far easier to engage a diverse group when handling one specific concrete challenge (Lifset 2008). Additionally, a core value set and passion behind networks is a strength when bringing together a wide range of stakeholders. The key is the ability to orchestrate these engagement initiatives and
partnerships in a way that fosters the greater purpose of the field. This is best achieved through a common organizational usage of the FSSD. Through collaboration, networks can function efficiently within the system to drive sustainability.

**Implications in the Field**

These key insights into barriers for collaboration across the field bring up the question of real-world application. How can network administrators currently apply this knowledge?

A comprehensive understanding of cross industry connections, with a particular focus on the potential of organizational networks, gives a practitioner the ability to address unique challenges and opportunities in the field of sustainability. This thesis is also complimented with a supplementary guidebook, providing a user-friendly summary of our results and real-world application.
Glossary

Key Words:

Adherence: Is the action of concordance. In this context, adherence refers to an individual organizational network’s concordance with a commonly accepted definition of sustainability.

Awareness: Comprises a human's perception and cognitive reaction to a condition or event.

Backcasting: A planning tool that approaches a current situation or problem from a future perspective.

Biosphere: A part of the Earth, including air, land, surface rocks, and water, within which life occurs, and which biotic processes in turn alter or transform. From the broadest bio physiological point of view, the biosphere is the global ecological system integrating all living beings and their relationships, including their interaction with the elements of the lithosphere, hydrosphere, and atmosphere.

Clustering Effect: A social phenomena in which a network will naturally organize itself into groups of similar actors that are densely connected among themselves and only loosely connected to other groups.

Critical Success Factor: An element of an organization or project that is necessary to achieve its purpose.

Collaboration: A process where two or more people work together toward a common goal, by sharing knowledge, learning and building consensus.

Collective Intelligence: A form of intelligence that emerges from the collaboration and competition of many individuals.

Complex Network: In the context of network theory, it is a network that has certain non-trivial topological features that do not occur in simple networks.

Critical Mass: A socio-dynamic term to describe the existence of sufficient momentum in a social system such that the momentum becomes self-
sustaining and fuels further growth.

**Cross-Sectoral:** Describes an action or process that spans or occurs across multiple industries in society.

**Cylinder Metaphor:** Metaphor used in comparison with the Funnel metaphor to highlight current global sustainability challenge.

**Decentralization:** The process of dispersing decision-making governance closer to the people or citizen. In network theory, decentralization refers to a scale-free network structure, in which power is distributed across multiple hubs, as opposed to one centralized hub.

**Early Adopter:** An individual or organization within society with a high probability of adopting a new social innovation or ideology, while also acting as a role model within a community. An early adopter is characterized by a high level of respect by peers, and the successful and discrete use of new ideas. An early adopter acts as a bridge between innovators and the rest of society, decreasing uncertainty and distrust of a newly introduced innovation.

**Ecosystem:** A natural unit consisting of all plants, animals and microorganisms (biotic factors) in an area functioning together with all of the non-living physical (abiotic) factors of the environment.

**Emergence:** Refers to the way complex systems and patterns arise out of a multiplicity of relatively simple interactions. Emergence is central to the theories of integrative levels and of complex systems.

**Emerging Sustainability Networks (ESNs):** Term to describe networks working in the field of sustainable development with a vision and function that is approaching the definition of a Sustainability Network (SN). These networks have the highest probability of evolving into Sustainability Networks.

**Fitness:** In network theory, fitness refers to a network’s ability to attract new links.

**Framework for Strategic Sustainable Development (FSSD):** A methodology for strategic planning for sustainability initiatives, utilizing a whole-systems approach and science-based principles as developed by the international organization The Natural Step. The Framework consists of a
backcasting planning process for sustainable development based on four principles for sustainability.

**Funnel metaphor:** The funnel is a metaphor used within FSSD to describe the current global trends of decreasing resource availability and functional capacity. Please see FSSD for additional information.

**Global Action Networks (GANs):** A global, multi-stakeholder organization focused on issues for the public good. These organizations are diversity-embracing and boundary-spanning.

**Globalization:** In its literal sense is the process of globalizing, transformation of some things or phenomena into global ones. It can be described as a process by which the people of the world are unified into a single society and functioning together.

**Growth:** In network theory, growth refers to a network’s capacity to create new links.

**Homophily:** The natural tendency of individuals to associate and bond with similar others. The presence of homophily has been discovered in a vast array of network studies.

**Human Network/Social Network:** An interdependent, often informal group of people organized around a specific function, ideology, or value system. For the purposes of this paper, the only networks that will be addressed are sustainability-related organizational networks.

**Hub:** A node within a network with a high degree of connections to other nodes.

**Industrialization:** A process of social and economic change whereby a human group is transformed from a pre-industrial society into an industrial one.

**Law of Preferential Attachment:** In network theory, this law describes the tendency for new nodes within a network to link up to existing nodes that already have more links than other nodes.

**Natural System:** A system is any organized assembly of agents interacting to accomplish a set of specific functions. A natural system is any system involving living organisms. A system can also be characterized by 1) a
functioning set of components, 2) a flow of energy which powers them, and 3) a process for the internal regulation of their functioning.

**Network:** Can refer to any interconnected group or system. More specifically, a network is any method of sharing information or resources between two systems.

**Networks for Sustainability:** A network working in the field of sustainability that includes an objective of sustainable development within its organizational vision and purpose.

**Network-of-Networks:** Term to describe the field of sustainable development, a network comprised of multiple, interacting organizational networks. A defining characteristic of a network-of-network as opposed to a simple network is its capacity to act as a hub, with other networks showing a preferential attachment to linking with this network. Organizational networks acting as hubs within the field of sustainability can also be defined as a network-of-network.

**Node:** A connection point within a network.

**Organizational Networks:** A pattern of social relations over a set of persons, groups, or organizations, organized around and defined by a specific group function. An organizational network is characterized by greater agility and adaptability as compared to a vertically integrated company, due to more flexible relations with external stakeholders and a generally less hierarchical management structure.

**Preferential attachment:** (See Law of Preferential Attachment)

**Scale-free network:** A type of complex network most apparent in social structures than any other type of complex network. It is characterized by a decentralized structure with several highly connected nodes (hubs) and many nodes with low connection activity. Scale free networks structure and distribution is independent of size or number of nodes. This can be visualized as connected clusters of activity hubs.

**Six Degrees of Separation:** This term describes person-to-person interconnections as shorter path lengths than commonly understood. Society itself is a small-world network, characterized by high levels of clustering and short distances between any two people.
Strategic Sustainable Development: (See Framework for Strategic Sustainable Development)

Sustainability: The capacity for society to develop in a manner that does not detract from vital ecological support systems nor undermine the ability of future generations to meet their own needs. (See Sustainable Development)

Sustainable Development: Human development that meets the needs of the present without compromising the ability of future generations to meet their own needs, as defined by the Brundtland Commission.

Sustainability Networks (SNs): An organizational network that embodies a whole-systems, science-based definition of sustainability in both vision and function, has an awareness of its purpose within the global field of Sustainable Development, with the capacity to positively interact and collaborate with other networks in the field.

Sustainability Principles: FSSD states four scientific principles that should be adhered to support life on Earth within a natural system. These are as follows: In a sustainable society, nature is not subject to systematically increasing: 1) Concentrations of substances extracted from the earth's crust, 2) Concentrations of substances produced by society; 3) Degradation by physical means; and, in society, 4) Human needs are met worldwide.

Swarm intelligence (Swarm theory): Intelligence based on the collective behavior of decentralized, self-organized systems.
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1 Introduction

This research explores how global organizational sustainability networks can help catalyze change for a sustainable society. This topic is addressed through the lens of a Framework for Strategic Sustainable Development (FSSD) and network theory, with a focus on the internal critical success factors and external barriers to developing effective organizational sustainability networks in the future.

1.1 Research Context

Society is facing a global sustainability challenge as a result of globalization, industrialization, rapid population growth, mismanagement of natural resources, and overuse of fossil fuels. (UN 2006; IEA 2007; WRI 2007). This has resulted in significant environmental damage, exacerbated poverty, public health challenges, mass extinction of species, and rising sea levels (Schaeffer 2003). This global sustainability challenge is a whole-systems dilemma, affecting everyone. In an increasingly interdependent world, many businesses, organizations, and governing bodies are still acting as individual systems within the biosphere. Solutions to this systematic problem require these individual systems, to address sustainability challenges with a global perspective.

As issues such as climate change and poverty are global in nature, potential solutions must match these challenges in scale, reflecting globalization’s distributed nature (Johnson 2001). Recent years have shown new and exciting developments that are altering the way people connect for the purposes of social change. Organizational networks including Global Action Networks, the Clinton Climate Initiative, and Wal-Mart Stores are increasingly taking action and organizing in unique ways to address these challenges. Non-traditional partnerships are emerging, and trends such as social entrepreneurship are on the rise, producing creative and innovative business models and network structures previously unheard of in the non-profit or business communities (Elkington 2007).

These networks join together across important divides, between developed and developing countries; business, government and civil society; and across varying cultures and knowledge disciplines (Waddell 2004). Businesses are pressuring their suppliers through networks such as the World Business Council for Sustainable Development to reduce overall
CO2 emissions. Governments are involving constituents in the policy-making process via multi-sector networks, leveraging connections across the business, academic, and NGO communities to address sustainability on an increasingly global level.

Many current networks are global in nature but only indirectly address parts of sustainability. Others embrace a more holistic definition of sustainability, yet have limited reach or organizational capacity.

With environmental and social issues prevalent, undertaking research to assess the unique characteristics and challenges faced by sustainability-related networks today is an urgent endeavor. Globalization and the extent of the sustainability crisis demonstrate that collaboration is needed now to succeed in the years ahead.

"Sustainability, of course, is different (than the feminist movement, the civil rights movement, etc), because this is a question of human survival. Our species can survive racist sheriffs in Alabama... but our species can’t survive an environmental catastrophe. Unless a lot is done, unless this involves everyone... Lifestyles are going to have to change, attitudes, and policies will have to change.” – Noam Chomsky, MIT (Chomsky 2008)

The following study is based on the assumption that the rate of progress of the sustainability movement is directly linked to sustainability-related networks and their ability to organize creatively and successfully to address the challenges ahead. Preliminary research was dedicated to understanding the current structure and complexity of the field.

Focusing on organizational networks, this thesis does not examine Information Technology Networks; except as they can be applied as tools for organizational networks. Stakeholder groups considered included: business, academic, non-profit organizations, government, and the general public.

The primary research focus of this study was to identify the means in which organizational networks can best act as catalysts for sustainable development. The study was a two-phase research process, exploring:

1. The internal characteristics of networks, examining key success factors of existing networks from a broad range of fields, and
2. External barriers to creating successful sustainability networks.

This research built upon a strategic approach to sustainable development that has proven to be effective for hundreds of organizations around the world in planning for sustainability (well known examples include: IKEA, Volvo and Interface), addressed here as the Framework for Strategic Sustainable Development (Robèrt 2000). In this approach, FSSD provides a structure for understanding sustainability and analyzing and developing strategies, actions, and tools to move towards a vision of organizational success within a sustainable society.

1.2 Defining a Network

1.2.1 What is a Network?

A network is defined as: “any interconnected group or system”, and “a method of sharing information between two systems” (Barabási and Oltvai 2004; Webster 2008). Networks enable groups to find synergies in their work and help avoid duplicating efforts. For the purposes of this research study, the term 'network' will refer to an 'organizational network', with a focus on global, multi-stakeholder networks.

An understanding of network science helps decision makers see the role that networks can play in moving towards a sustainable society. Different network structures provide varying levels of resilience and opportunities to share information. It helps by giving a visual understanding of networks that can assist in identifying organizational gaps and prioritizing measures. Network science understanding assists in creating effectively functioning networks that can be essential to help coordinate global responses to issues such as climate change.

Network Structure

An early understanding of network structure is an important component in order to best realize the potential of networks as a catalyst for the sustainability movement. Network scientists have discovered that social network structures follow a universal pattern known as a 'scale-free network', in which the majority of nodes in a network have a very small amount of links, with several key hubs producing a disproportionate number of links to other nodes (Barabási 2002). These networks are dynamic, growing one link at a time. Specific individuals or organizations
within a network are natural connectors, and can be labeled as ‘hubs’, which attract and create an unusually high number of links from themselves to other entities.

Figure 1: Three Kinds of Network Structures.

This concentration of links to a small number of nodes leads to another characteristic of complex networks, known as the 'small world' phenomenon, a term popularized by the book *Six Degrees of Separation*. This states that any node is separated from any other node by a small number of links, or degrees of separation, regardless of the size or complexity of the network (Watts 2004). This can often lead to a 'clustering effect', in which people gravitate to similar people geographically near to them to form a sub-network. This small cluster is then connected to a larger network. Examples of local clusters include a community church or a local chapter of a national organization.
Network Behavior and Function

Network formation, emergence and growth are key network behaviors to understand when assessing a network’s potential success rate. Complex networks are characterized by three properties: Growth, Preferential Attachment, and Fitness. We must first understand that networks initially emerge from a single node (Barabási 2002). As a network grows, new nodes show a ‘preferential attachment’, choosing to link to other nodes that has the most previously connected links (Barabási 2002). Each node also has a certain “fitness”, or attractiveness to other nodes, and can therefore become a hub, even if emerging as a latecomer to the network. Google, for instance, became the leading hub of Internet search engines because it had a high-level of fitness for Internet-users.

Networks cover a wide range of functions including: enabling dialogue, sharing information, and contributing to work in fields such as Sustainable Development (SD). Excellent examples of networks working in the field of SD include: Global Action Networks, an assembly of organizations supported by GAN-Net, and One Planet Living, a network of the World Wildlife Fund (WWF). Global Action Networks (GANs) are defined as international, multi-stakeholder networks that generate systemic change through a range of non-violent, boundary-crossing and diversity-embracing activities, realizing the public good of global sustainability and security. (Waddell 2004) GANs implement interdisciplinary action-learning and
build multi-stakeholder and cross-sectoral, inter-organizational networks. One Planet Living is an international network of organizations based on ten principles of sustainability as defined by BioRegional and the WWF. In figure 3, a partial network map for the WWF is shown, whereby the WWF is positioned as the hub. The WWF’s network includes stakeholders such as: the United States (US) and United Kingdom (UK) governments; and organizations like the Marine Stewardship Council (MSC), Hewlett Packard (HP), and the United Nations (UN).

Figure 3: A simplified map of WWF’s role as a hub for multiple stakeholders

1.3 Strategic Sustainable Development

1.3.1 Context

The most widely accepted definition of sustainable development in use today comes from the Brundtland Commission, which defined sustainable development as “meeting the needs of the present without undermining the ability of future generations to meet their needs” (Brundtland 1987).

The global sustainability challenge needs to be approached on a strategic and whole-system level that enables needs to be met now and in the future. Strategic Sustainable Development (SSD) provides a framework that helps to operationalize the Brundtland definition. This framework creates an understanding of sustainability, and develops strategies, actions, and tools to move towards a vision of organizational success within a sustainable society.
SSD enables organizational networks to strategically and systematically approach sustainable development through the creation of a shared language and planning methodology (Robèrt 2000). In addition, networks benefit from the whole-system approach as it helps them avoid developing solutions that create new problems.

1.3.2 The Earth as a System

Society exists within the Earth’s natural system, or biosphere. Established laws, such as entropy, gravity, and thermodynamics, dictate interactions between society and the system. In order to make decisions that contribute to sustainability, it is essential to understand these system constraints.

Society’s interaction within the system can be illustrated by the ‘funnel’ metaphor (Holmberg et al. 1996), which is illustrated in Figure 1. The common misconception today is that society and all organizations are passing through a ‘cylinder,’ where the walls of the cylinder represent an idea of the availability of an infinite number of resources, where the ecosystem will continue to ensure and support this growth (Robèrt 2005). The idea that society and the biosphere can exist wholly separate from one another has created the reality of a ‘funnel’ metaphor. In this example, the walls represent a systematic diminution of resources.

![Figure 4: 'The Funnel'. Society’s constraints in the system (Source: The Natural Step International)](image)

1.3.3 The Sustainability Principles

In order for society to exist within the boundaries of the natural system,
four guiding sustainability principles have been established (Holmberg et al. 1996; Ny et al. 2006). These sustainability principles are science-based, distinct and non-overlapping. The first three relate to environmental and natural constraints, while the fourth addresses barriers restricting human needs within society. They are:

**In a 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 of physical means

**and in the society...**  
IV. People are not subject to conditions that systematically undermine their capacity to meet their needs

Figure 5: The Four Sustainability Principles.

**1.3.4 Backcasting**

‘Backcasting’ is a method where an ideal future is envisioned, allowing planners to effectively determine a preferred outcome in a strategic fashion using a shared vision (Robinson 1990, Dreborg 1996; Holmberg and Robèrt 2000). This process differs from forecasting, as it is “a concern, not with what futures are likely to happen, but with how desirable futures can be attained. It involves working backwards from a particular desirable endpoint to the present in order to determine the physical suitability of that future and what measures would be required to reach that point” (Robinson 1990). Using backcasting with the four sustainability principles, an organizational network can visualize what it should look like in a sustainable society.

**1.3.5 Planning: the Five-Level Framework**

The Five-Level Framework for planning in complex systems assists in developing and implementing strategy for sustainability. The ‘Systems’ level defines natural laws and boundaries. This defines society’s and an organizational network’s coexistence with and reliance on the biosphere. The ‘Success’ level defines the minimum requirements that
organizational networks must meet within the constraints of the sustainability principles. The ‘Strategy’ level represents a prioritization process within these constraints, utilizing backcasting methods to establish organizational priorities after creating a vision for success. Prioritized planning steps are then realized at the ‘Actions’ level, with the appropriate tools and methods required for success are determined in the ‘Tools’ level (Ny et al 2006).

Figure 6: The ‘Five Level Framework’ planning for SSD. (Robèrt 2000 Adapted from Ny et al 2006)

1.3.6 Strategic Prioritization

Organizations using the FSSD ask three prioritization questions to effectively make strategic planning decisions (Robèrt 2005). The questions assist in having the most effective and timely decisions made. They ensure the decision made is a decent investment, is flexible to minimize, organizational risk, and is moving in the right direction towards a sustainable society. These questions are:

1. Is this a step in the right direction towards the desired goal?
2. Is this a flexible platform for future ideas and innovations?
3. Will this provide a positive return on investment?

1.4 A Proposal for a Sustainability Network Definition
Backcasting from a sustainable society, organizations can envision what the ideal network serving as a catalyst for sustainability would look like.

Defined for the purpose of this study as a ‘sustainability network’, this is described as an “organizational network with a global awareness, a governance structure that involves all stakeholders, and adherence in vision and function to a commonly agreed upon definition of sustainability in the socio-ecological sense.”

Using the Five-Level Framework as described above, this description of a sustainability network can be defined as:

**Level 1 (System):** The organizational network is aware of the state of unsustainability within the socio-ecological system and is sufficiently aware of its role within the system and its relationship with stakeholders.

**Level 2 (Success)** Based on its understanding of the system, the organizational network has aligned its vision with the sustainability principles. It defines its purpose and ultimate success as it relates to the sustainability principles.

**Level 3 (Strategy)** The network follows a set of strategic guidelines that allow it to move towards its vision.

**Level 4 (Action)** In carrying out its activities, the network organization takes prioritized actions that move it in the direction of its vision.

**Level 5 (Tools)** The organizational network selects and makes use of tools and resources that support its strategy and actions undertaken to achieve success.

The definition of an ideal sustainability network serves as a model and tangible goal for networks currently in the field. In the absence of many existing sustainability networks according to the above definition, the study looked for organizational networks that were early adopters of sustainability.

Networks in the field with a vision, and partially function in line with the concepts of sustainability without fully realizing this in purpose, function, or through the five level framework, were identified as ‘Emerging Sustainability Networks’ (ESNs). These networks have great potential as
drivers for sustainable development, and have a high probability of evolving into sustainability networks.

Organizational networks that best fit the criteria of an emerging sustainability network included many of the following:

- Addressed one or more sustainability principles
- Viewed itself as a part of global sustainable development efforts
- Understood its relationship to other networks
- Used a comprehensive definition of sustainability
- Applied systems thinking
- Effectively used network science
- Included all stakeholders

As seen in Figure 7 below, Sustainability Networks (‘C’) will act as catalysts to bring organizations (‘A’) and society together, moving them towards a sustainable future (‘D’). Without these sustainability networks presently established, we must ensure that we are moving in the right direction and locate the networks and ESNs (‘B’) that will help get us there.

![Diagram of Organizational Networks as Catalysts for Strategic Sustainable Development](image)

*Figure 7: Backcasting from a sustainable future: The Evolution of Organizational Networks as catalysts for Sustainable Development.*

Organizational networks that are committed to a strategic vision of sustainability can benefit greatly from this definition of a Sustainability Network, as informed by network science and the Framework for Strategic
1.5 Rationale

At the outset of this study it was known that there are problems with current organizational sustainability networks. Some of the issues included:

- Some networks do not appear to fully address sustainability. They may focus on single issues without considering other sustainability issues and therefore risk solving one problem only to create another.
- Examples of failed networks showed that clearly some networks have been ineffective, regardless of their aims and scope. Such examples may provide useful lessons to others.
- There are cases where networks appear to be duplicating effort or have limited scope.
- Networks with similar goals could perhaps use resources or have a bigger influence through better means of collaboration.
- Sustainability networks have not traditionally considered network theory directly in their operations. Understanding the properties of networks may lead to more effective use of them as catalysts for change towards a sustainable society.
- Approaches to strategic planning for sustainability are not in widespread use across society. It was considered that the authors’ knowledge of the Framework for Strategic Sustainable Development might provide useful guidance on effective use of networks in change towards a sustainable society.

These issues clearly highlighted the need for further investigation and led to our research questions and the methodology that follow.

1.6 Research Scope

The primary audience for this paper is for people who manage networks defined as ESNs, as well as for influencers in the field of sustainability. This audience includes practitioners from academic institutions, businesses, non-profits, or other networking sectors that are concerned about the global sustainability challenge.

This paper attempts to identify and address factors that are critical to the long-term success of networks building towards a sustainable society. The Framework of Strategic Sustainable Development assisted the writers in
determining gaps and barriers existing in the field and strategically plan for solving these challenges.

Perspectives were gained from a wide array of organizational cultures, and the target population was chosen to provide unique insights on future trends, innovations, challenges, and input into existing creative and innovative networks. As most network, sustainability thought leadership, and global organizational headquarters are based in developed countries, this region was the primary source of literature, interview, and case study information.

**Limitations**

Network success for sustainability on a global scale involves incorporating a wide range of decision makers, industries, and sectors across the field. In order to cover each component essential to networks succeeding in creating a sustainable society, each theme could not be presented in this work as extensively as deserved. Time constraints limited the writers’ research into unique challenges of networks in developing countries. The population sample also targeted a specific demographic in order to best assess network activity in the field today, but was not completely representative of the global population. Sustainability initiatives are still predominately clustered in developed nations, specifically North America and Europe, and researchers undertaking this study recognize this limitation and encourage future research to undertake this topic with different demographics. Please see the section on Future Research for more information.

**1.7 Research Questions**

The following research is based on the assumption that potential exists for organizational networks to be a catalyst for a sustainable society. As a result, the potential for social change is contingent on the success of newly emerging and existing networks. The following questions were explored:

**Primary Question**

- Backcasting from a sustainable society, how can organizational networks effectively catalyze change for Strategic Sustainable Development?
Secondary Questions

- What key factors are critical to the success of an existing or emerging organizational network in the sustainability field?

- What are the current barriers to success for organizational networks for sustainability?
2 Methods

The research strategy for this thesis can be described as exploratory, qualitative research. Research methods included: literature reviews, interviews, action research, case studies, analysis, and discussion. The research methods followed a logical and complementary progression that allowed each stage to build upon previous work and insights gathered.

2.1 Research Design

Maxwell’s Qualitative Research Design was implemented to enable a systematic, interactive research approach. This enabled researchers to process information as understanding of the topic of networks evolved (Maxwell 2005). Maxwell identifies five key, separate components of research that interact with one another (see Figure 9).

![Figure 8: Maxwell’s Interactive Model of Research Design](image)

The purpose of the design is to move beyond linear design challenges while still enabling research to be conducted in a sequential manner. For a qualitative study, it is important to avoid the traditional linear methods, as they do not allow for reconsideration of the methods during the research process, should new information or change come to light. In a qualitative study, “research design should be a reflexive process operating through
every stage of the project” (Hammersley & Atkinson 1995).

Maxwell’s design is known to be interactive in two distinct ways: 1) the model structure is interconnected and flexible, allowing each component to have implications on the others; and 2) the design is able to change due to circumstances of study conditions, rather than being permanently fixed to a stringent research protocol.

This design process allowed the researchers to progressively evolve their work as new insights were gained. During the interview stage, each interview was conducted utilizing the Deming Cycle; Plan, Do, Check, and Act (P, D, C, A). This is done in order to produce progressively superior interview questions that bring deeper insights (Deming 1986). While the stages of research followed a sequential order, the approaches overlapped to provide opportunities for more effective research to be conducted. This came as a result of a discovery in one stage informing and influencing the direction in another. For example, the literature review needed to overlap with much of the interviews and case study research as subjects interviewed provided insights into relevant literature recommendations, and vice versa. Figure 10 provides a timeline of the research stages.

As mentioned above, the methods functioned in a complementary manner to give the researchers the most opportune means of discovering and validating the answers to proposed thesis questions. Interviews produced the key findings; however, action research and case studies delivered
insights that wouldn’t otherwise been revealed.

Questions were posed to:

1. Discover the current reality and challenges of networks in the sustainability field;

2. Identify future barriers and possible solutions unique to each network;

3. Assess proposed steps as moving in the right direction.

2.2 Literature Review

The first research stage served as the foundation for the whole thesis. Information and overall themes collected here greatly informed and influenced the following stages’ questions and overall objectives. Previously published materials on organizational network research were evaluated to determine a logical starting point for this study. Literature reviewed focused on network science and multi-sector sustainability networks, and included: peer reviewed journals, books, news articles, and online websites. Published, peer reviewed research on the subject of Strategic Sustainable Development was utilized extensively for the purpose of this paper. Peers, supervisors, friends, and interviewees were also helpful in providing further resources.

Information was collected primarily through journal and article databases, and multiple university libraries. Key research topics included: ‘sustainability networks’, ‘multi-sector networks’, ‘public-private partnerships’, ‘global networks’, ‘network success factors’, and ‘network theory’. Documents related to ‘IT Networks’ or purely ‘social networks’ were excluded.

Weekly team meetings were utilized to discuss, evaluate, and evolve ongoing literature findings and future action plans. In order to avoid researcher overlap with respect to time and focus, three broad themes areas were created for each team member to investigate: academic, professional, and non-governmental organizations (NGO). A shared online database was created for compiling reviewed literature. Summaries and quotes were posted to enable ease of use and referencing during the following research stages. As this online database grew, it became an increasingly central
focus of literature review meetings and overall thesis evaluation.

2.3 Interviews

Interview candidates or their networks were selected using the following criteria:

- Background in business, academic, NGO, government, network operation, and/or thought leadership on sustainability
- Global intents and actions based in sustainability.
- From large and small ESNs that included multi-sector, ‘whole-system’, or multi-stakeholder participation.
- Were in a position of influence over their networks and had a minimum of 5 years experience in their area of expertise.

For validity, a goal of conducting a minimum of 30 interviews was set. See Appendix A for a complete list of contributors. A questionnaire was established based on the primary and secondary research questions and is located in Appendix B. Utilizing the interactive process in our qualitative research design, the questionnaire evolved as new insights were acquired. The interview phase evolved into the two stages: stage one focused on discovering the internal critical success factors of sustainability networks; while stage two looked into the barriers existing externally in the field of sustainability that would limit a network’s success.

Originally interviews were exclusively phone-based; however, due to the constant modification of research methods to enable access to the best information possible, email responses were included as an acceptable format.

Phone interviews were conducted in 30-60 minute periods using the questionnaire format. Subjects were sent the questionnaire in advance in order to best formulate their answers (Phase I and Phase II questionnaires are located in Appendix B). Interviews were transcribed by two or three group members during the call. Key quotes from the interviews were highlighted for future reference and use. After evaluating the interview findings, each interview was formatted into a spreadsheet, which demonstrated where key thesis questions were being addressed and validated. The key findings to the primary thesis question came from this
research component.

2.4 Case Studies

Case studies from literature reviews and collaborative partnerships were reviewed and analyzed to add validity, and reinforce key findings. Several networks recently underwent significant changes to their operation and were suitable as case studies. Assessment of each study was done to determine if it provided examples of the key findings.

Case studies focused on:


- ‘The Business Sector: A Case Study of Wal-Mart’s Sustainability Initiatives’ (See Appendix E).

- ‘The Non-Governmental Sector: A Case Study of Global Action Networks as a Model of Success’ (See Appendix F).

2.5 Dialogues and Knowledge Integration

Informal communication including contact with peers, mentors, and potential acquaintances from conferences were reviewed to add a natural and logical component to the research.

2.6 Validity

The research scope of this study exclusively addresses experienced, leading subjects within the network science and sustainability fields. This scope attempted to be broad enough to enable findings from all stakeholder groups, while still focused enough to identify critical success factors and barriers of networks for sustainability. Collaborative projects, peer review, and action research additionally reinforced the thesis validity.

Bias within the research was minimized through the use of a structured and methodological approach, multiple student researchers, internal and external advisors, full transparency of study findings, and extensive peer review. The study obtained external validity, as it covered a broad range of
external stakeholders involved in the topic.

The timeline established for this research study was also its largest constraint. A final component of the paper provides suggestions and guidance for building from this initial study.
3 Results

The following section reviews data collected from literature reviews, interviews, and case studies compiled throughout the study. With the objective of assisting existing organizational networks to catalyze sustainable development, this body of research assessed these networks with consideration of network science, effective organizational management, and supported by the Framework for Strategic Sustainable Development. The following results are organized into two parts: internal development and external functionality.

Interviews were conducted with thirty-seven people (referred to here as ‘Respondents’) during the research period. Phase I of the interviews tested for the existence of critical success factors within networks in the field of sustainability. Eighteen individuals were interviewed during Phase I. During Phase II, a further nineteen people were asked for insights on barriers to networks in the field and how they may be overcome. This two-phase research process builds a solid foundation from which researchers were then able to explore potential solutions to existing barriers for organizational networks currently working in the field of Sustainable Development.

Initially, five areas emerged as a result of literature reviews conducted in Phase I of research and prior knowledge of the researchers. These thematic areas were used as categories to organize research results. As the research design called for research to evolve based on new information and insight, these categories expanded. Phase I research examined the internal capacity of networks, while interview questions, for example, evolved in Phase II to account for new themes on a network’s interaction within the field. The categories of results shown here are a result of research design evolving through Phase I and Phase II.

Healthy network structure and function (Internal capacity) must be established before addressing a network’s capacity to engage and collaborate with other networks in the field of Sustainable Development. As such, nine thematic areas emerged as defining criteria for internal capacity: Vision, Leadership, Resilience, Capacity, Engagement, Network Structure, Communication Tools, Positioning and Leverage, and Network Diversity.
Through Phase II research, three major themes emerged as barriers to network’s success to engage and collaborate with other networks in the field of Sustainable Development (external functionality). These barriers are described in this section. Key findings are described below.

### 3.1 Assessing the Internal Capacity of Organizational Networks: Critical Success Factors

The following results reflect the nine internal capacity themes described above. The original hypothesis was that there would be internal capacity issues unique to networks working in sustainability. Research, however, proved that internal capacity issues for networks in the sustainability field were not unique. These factors, nevertheless, did prove to be important. All nine factors were identified as important to a network’s success; these factors were not weighted in order of importance and several factors are complementary and overlap with one another. The case studies attached in Appendices D, E, and F provides further supporting evidence of the nine internal capacity themes found.

#### 3.1.1 Vision

Organizational Vision is the fundamental driver of networks in the field of Sustainable Development, as stated by over 80% of interviewees. Network administrators with the ability to identify the core vision and value set driving their network, can preserve the core values of the network while also stimulating progress.

Results have shown that a well-conceived vision consists of two major components: Core Ideology and an Envisioned Future (Collins and Porras 1994). The successful vision of a network builds on the interplay between these two complementary forces. Procter & Gamble, for example, has an overarching company vision that is the basis for every work decision made (Buyle 2008). Wal-Mart’s sustainability vision has been “built on Lee Scott’s speeches” articulating a sustainable future (Kistler 2008).

The key defining factor of a successful organizational vision is the use of a rigorous conceptual framework and a clear understanding of how that framework connects to the organizational network’s structure and function. Companies that enjoy enduring success have a core purpose and core values that remain fixed while their strategies and practices endlessly
adapt to a changing world (Collins 1996). The rare ability to balance continuity and change is closely linked to the ability to develop a vision. This vision provides guidance to network administrators regarding what to preserve and what to change.

"If we can reduce the world's energy impact in a substantive way, even if we can't reduce Google's impact in the immediate future, that is progress." – Bill Weihl, Energy Czar, Google (Weihl 2008)

Core Ideology

Core Ideology consists of: core values and a core purpose. Core values are the organization's guiding principles (Collins 1996). Core purpose relates to how the organization wants to operate on a daily basis. The UN Global Compact, for example, wants its partner companies to focus on strategically important issues, not just picking and choosing single issues. Their 10 principles are a holistic vision (Haertle 2008). Tom Ewart, Managing Director of the Research Network for Business Sustainability (RNBS) in Canada, draws strength in presenting their network vision as 'evidence-based' management and research as opposed to values-based management and research. With a core set of organizational values driving the research activity of the network and attracting new researchers, RNBS gains credibility and is able to function across sectors by providing evidence-based research to back up this value set (Ewart, 2008).

“The fundamental distinguishing dynamic of enduring great companies is that they preserve a cherished core ideology while simultaneously stimulating progress and change in everything that is not part of the core ideology” (Collins 1996).

“We’ve built the capacity among individuals, teams, and organizations to address the issues of systems thinking, shift in paradigms, mental models, and effective conversations for knowledge sharing and creating new knowledge. There aren’t many people sitting in a circle doing deep inquiry about what most concerns them, but we ask people to come in with what keeps them awake at night.” – Joe Laur, Director, Society for Organizational Learning (Laur 2008)

Envisioned Future

The ability to visualize and articulate a possible future state has always
been a vital component of successful leadership (Mayo 2007). The downfall of many failed organizational networks can be attributed to this lack of vision. A statement as simple as IKEA’s vision to create “a better everyday life” directs the company’s sense of purpose and long-term direction. With regard to its sustainability initiatives, this vision drives IKEA employees to make an overall positive impact on people and the environment (Bergmark 2008). Visions must describe the desired long-term future of the organization—a future that typically is not quite achievable, but not so fantastic as to seem like a ridiculous pipedream (Lipton 2003).

“Any highly functioning organization needs a laser-like focus.”
– Gregg Behr, Director of the Grable Foundation (Behr 2008)

3.1.2 Leadership

This study has shown that although leadership styles may vary, high-quality leadership is key to a successful network.

“We are in desperate need for good leadership.” – Hunter Lovins, Presidio School of Management (Lovins 2008)

As emerging networks are increasingly multi-disciplinary, spanning across different sectors and industry, it is crucial that individuals with solid leadership qualities and a sense of direction know how to optimize these networks. This leadership personality type can vary dependent on the type and structure of the network, with special importance placed on hub and connector personalities. 44% of Phase I respondents felt the role of leadership was as a facilitator. In addition, three respondents felt that power within a network must devolve, and four felt that leadership was essential to a network’s survival.

Leadership as a Catalyst in Scale-Free Networks

The most prevalent leadership style within the organizational networks sampled was as a catalyst or facilitator role, especially when engaging a wide range of diverse stakeholders. Joe Laur likened this style to alchemy:

“All I do is facilitate. It’s like being an alchemist, bringing together the right people at the right time.” – Joe Laur, Sustainability Consortium Director, the Society for Organizational Learning (Laur 2008)
The facilitator role of leadership was also referred to as “brokering” between parties:

“You need a set of people to broker collaboration as nodes.” – Cesar Hidalgo, of the Center for Complex Networks Research and Harvard School of Networked Governance (Hidalgo 2008)

“I play the role of broker a lot. In order to be a successful broker, you need to have a good idea of what you’re going to do once you get everyone together in a room. What’s your road map to bring them together? Academics have very powerful institutional incentives to be divorced from the rest of the world. Practitioners have little incentive to invest in the details that academics are so fascinated over.” – Reid Lifset, Chief Editor, Journal of Industrial Ecology (Lifset, 2008)

This role diverts from traditional authoritative leadership with a focus on proactive, engaging facilitation. This type of individual has a keen sense of understanding of the complexity and structure of its network, as well as the social dynamics within the network. With this critical knowledge, a network administrator needs only to be able to perceive gaps and opportunities for improved performance or connections within the network in order to promote success. An agent within a network thus can characterize effective leadership with the ability to incur change that increases the fitness for that system in its environment (Goldstein et al 2007).

Catalyst leadership was not only the most prevalent style, but emerged throughout research as highly successful and efficient means of managing a network. This role included an acute personal awareness of a leader’s potential to shape change. Matthew Kistler, head of the Sustainability Division of Wal-Mart, perceives himself as’ a conductor or conduit’ (Kistler 2008).

By recognizing the necessity of creating the proper conditions for success, these individuals approached their leadership role with the objective of designing organizational structures to best support positive change.

**Leadership as Engagement, Not Mandate**

The use of top-down management has proven less popular within network administration throughout this study. Although “strong leadership” was
deemed a necessary trait of a successful network, interpretations of leadership success varied from that of a traditional business leadership role. The abilities to engage and build capacity showed to be key leadership functions within a successful network, though this manifested in several forms. Overall, network success was supported by a leader’s ability to support the voluntary engagement of its stakeholders, in which action towards a more sustainable future was a collective choice, not mandated policy. A focus on solutions and results, as opposed to compliance with regards to sustainability, proved highly successful.

Bob Willard, author of *The Sustainability Advantage*, notes that a successful leader knows how to create value from his or her network by enabling a two-way relationship with its stakeholders.

“People always want the data and resources of a network but find it difficult to contribute.” (Willard 2008)

This idea of value in leadership was repeated in several interviews.

“*It is easy to create connections, but difficult to create value in these connections.*” – Tom Ewart, Managing Director, Research Network for Sustainable Business (Ewart 2008)

This research has shown that leaders as engagers (as opposed to enforcers) to be the most common element to increasingly crucial to the long-term success of maintaining network value and relevance.

**Innovative Leadership Models for Collective Efficiency**

Results from the population sample suggest that a successful leadership role within a network requires the capacity to be malleable and adaptable to the needs of its stakeholders.

“You create successful networks by matching the needs of the people with the right tools in ways that are easy for them to understand and use, both in the ways they were intended and in creative ways that aren't planned.”- Jon Coate, Founder, WELL Foundation (Coate 2008)

Göran Carstedt, Senior Director of the Clinton Climate Initiative (CCI), states that CCI's largest barrier to success is the learning curve within CCI
and of leaders in partner organizations:

“The question is not if we have the solutions, it's if we can learn fast enough?” – Göran Carstedt, CCI (Carstedt 2008)

An attitude of servitude also proves highly successful for the network leaders surveyed in this study. Carstedt describes his leadership style with CCI as partly due to his focus on results and solutions rather than ownership, and the ability to serve instead of mandate. By enabling a city to best address climate change, CCI had no need to direct orders but instead focus on creating dialogues between staff and municipal leaders (Carstedt 2008).

3.1.3 Resilience

This research examined a network’s resilience, its ability to provide and maintain an acceptable level of service while facing various challenges to normal operation, and showed that capacity building and adaptation to risks and barriers to growth were essential aspects of the long-term fitness of a network. Several interview respondents cited resilience as an important factor, though interview answers to resilience were mixed. 50% of respondents said they did not know what would keep a network functioning effectively in the long-term, a further 17% of respondents spoke of failed network experiences.

Other responses included:

- Importance of Community values to network resilience (22%).
- Convenience.
- The need for the network to evolve.
- A focus on solutions.
- Network had a long history.
- The need to be the first mover.

Analyzing an organization’s resilience from a network or systems perspective identified the network in the greater context of its societal system. This confirmed the importance of “influential superordinate-systems of which the organization is only a part” (Riolli and Savicki 2003).

*Network Relevance in a Time-Crunch Society*
One of the greatest challenges to network success in the sustainability field is the ability to establish and retain relevance for multiple stakeholders across a long time frame. The ability to tap into a larger community of individuals sharing a similar value system is a powerful tool for engagement. The most successful networks presented throughout this study have a strong focus on solutions, creating positive value for the network simply by engaging in it.

“People are hungry for solutions. Mainstream media and culture is long on analysis and short on solutions.” – Leif Utne, Editor, Utne Reader (Utne 2008).

**Risk Management, Avoiding Network Failure**

Innovative and proactive risk management greatly reinforces the strength of existing or start-up networks (Dalziell and McManus 2004). Much of a network’s ability to manage risk relates to network structure and leadership. The Clinton Climate Initiative uses a business-oriented approach in the fight against climate change through practical, measurable and significant ways (Carstedt 2008). Risk and growth management are managed along the way, and CCI even capped its network’s growth for a 6-month time period in order to re-focus and organize efforts to ensure highly efficient operations.

Organizational Networks achieve resilience by maintaining a flexible platform to their function and operations. By being dynamic in a complex system, these networks are able to produce unanticipated changes.

“The Global Reporting Initiative is a machine that is interested in updating itself every few years, this makes people more comfortable with joining.” – Ralph Thurm, COO, the Global Reporting Initiative (Thurm 2008)

**Long-Term Provision of Value and Relevance**

Another significant challenge stated by this sample population of networks was their capacity to support long-term engagement by stakeholders. A new network generally has an initial start-up phase with a flurry of activity, but the real systemic change that takes place is with those network connections that can still stand in the long-term. The initial challenge of creating a network of value can often be overtaken by the long-term
challenge of sustaining this value.

“The real world can be much more complex than can be perceived theoretically or academically. P&G provides stakeholders a ‘reality check’ to their goals and initiatives.” – Bea Buyle, Sustainability Division of Procter & Gamble (Buyle 2008)

“The value of networks is helping network members to accomplish what is beyond their individual missions or capacity.” – Alex Lackner, Concurrent Technologies Corporation (Lackner 2008)

### 3.1.4 Capacity

Capacity can adversely affect any individual, organization, or entity in meeting their needs and goals. When put in the context of organizational networks like ESNs, limited network capacity can halt their growth, minimize their effectiveness, decreasing network resilience and even cause them to fail.

Of the 18 network influencers interviewed in Phase I, resource constraints were identified as the primary capacity issue. 50% of those interviewed cited that time, money, and thus the need to hire more people, were limiting their network from further growth or increased effectiveness.

Other capacity issues that appeared for the networks included:

- A lack of engaged people or partners (17%).
- Too fast of a growth rate.
- Too much information being available.
- Participants being physically too far from the core network.
- The network being too big.
- Too focused in a particular field.

Interestingly, two respected networks mentioned that capacity was not a concern for them. Both the World Wildlife Fund One Planet Living, and the United Nations Global Compact have managed to avoid capacity issues. This is due to their long history of working in the global environment and ability to receive additional funding should resource constraints be identified as a future concern.

Other networks found difficulty maintaining capacity while positioning themselves in the field and realizing the complexity and magnitude of the
global sustainability challenge

"Our capacity problem is determining which networks to join...there is just too much information out there, and networks vary considerably in quality and usefulness" – Tom Leathes, Director, Acre Resources (Leathes 2008).

“People lack the bandwidth to do beyond what they’re already required to do. Almost everyone I know feels stressed. Personal sustainability remains a universal challenge for almost everyone I know in this field.” – Joel Makower, Founder, Greener World Media (Makower 2008)

Jean Francois Barsoum of IBM showed frustration in the imbalance between the magnitude of the task their network was taking on and the limited availability of people with time and energy to commit.

“We’re taking on too much already. Where’s the time, energy, and people to accomplish all this? It’s just not there at the moment.” (Barsoum 2008).

3.1.5 Engagement

“We need to tap into human nature rather than allowing it to be a barrier.” (Willard 2008)

Engagement is a critical factor of success for an ESN. The creation of an inclusive, unique, and valuable platform will maximize participation of individuals in a network. More than two-thirds of those interviewed stated network ‘value’ as the top reason for engagement. A successful network positively influences engagement by creating value for the participants. This value can be created by: sharing knowledge, providing access to useful information, providing something unique, or from its strong reputation.

Participant engagement in a network was strongly felt as a primary success factor. Reasons for engagement stated throughout interviews included:

- Opportunity to participate (67%).
- Knowledge sharing and access to information (56%).
- Perceived direct value in the network (44%).
- Shared passion for the organizational vision (44%).
• Network reputation (33%).
• Personal feeling of inclusion (17%).
• Shared participant agenda or framework (11%).
• Unique appeal of the network (11%).
• Accessibility (6%).

**Successful Strategies for Engagement in a Network**

Engagement is best created by an ESN when it understands the core nature of being a network. A network is created to act as a “hub” for participants, where it is used as a connector that allows participants to reach the people they need (Barabási 2002). People ultimately join and engage in a network when they perceive ‘value’ within the network (Outhwaite 2008).

“We do things that have a direct connection to what they’re interested in. We are a hands-on, roll up your sleeves, type of organization. We have shared values with them, and they like the results oriented focus of our work.” – Andy Mangan, United States Business Council for Sustainable Development (Mangan 2008)

"If you're trying to impact practice and save the world, you need to make your research relevant. Practitioners have appreciated the opportunity to contribute to the research agenda and fund projects on their priority issues,” commented Tom Ewart, when asked to address why many practitioners have become engaged with the RNBS. (Ewart 2008)

“"The only way to be successful is for people to participate out of free will” – Cesar Hidalgo, of the Center for Complex Networks Research and Harvard School of Networked Governance (Hidalgo 2008)

**New Models to Overcome Old Engagement Challenges**

The creation of Global Action Networks (GANs) in the 1990s arose from a number of issues including the absence of a real engagement process. GANs are focused, issues-based networks that were established to confront the gaps existing in linked multinational organizations such as the United Nations. A key gap area that a GAN works to overcome is participation; GANs work to include all stakeholder groups in a governance structure. This structure utilizes legitimate engagement and consensus building to be
an effective global network (Waddell 2007).

### 3.1.6 Network Structure

Structure has likely been the most studied component of network and management science over the past 20 years. Traditionally, networks were established in centralized, hierarchical structures. However, a decentralized structure may be more suitable for network success. Over half of interviewees (56%) championed a decentralized structure as key to network success. This is especially the case in large global systems trying to tackle complex issues (Barabási 2002).

**Decentralized Networks**

In addition to the 56% championing a decentralized structure; two further networks were moving towards a decentralized structure; another two felt that they were in a “mixed” network structure (some centralized and decentralized structure); and two more felt that they were part of several networks.

“It’s clear that single-issue organizations dominate the field, the beauty is that we can work with all these stakeholders,” -Ralph Thurm, describing the benefits of a decentralized GAN structure for the Global Reporting Initiative (Thurm 2008).

Literary research found that the strength of a decentralized structure lies in a number of components. First, local networks have the decision-making ability to be most effective in their regions, an area where these networks have the best understanding of the existing challenges and opportunities. Next, the global network is at a reduced risk of failure by moving away from a centralized structure where there is only one ‘super hub’, thus allowing minds to work simultaneously towards the same problem. Lastly, this decentralization encourages motivation and individual creativity while being flexible (Malone 2004)

**Centralized Networks**

Centralized network structures may be easier to monitor initially, but they are more vulnerable to failure, as they mainly rely on one super-connected hub to function. Seventeen percent of interviewees identified being in a
top-down, centralized structure; none of the other ESNs intended to move towards a centralized structure. By comparison, decentralized network structure provides stronger system strength through its dispersed nature.

Interestingly, two people felt that they weren’t actually in a network at all, even though their organization could clearly be defined as a network. This lack of self-identification can be seen as a limiting factor when considering an ESN’s place within the system. As interaction between networks in the field of sustainability is better defined through shared definitions and systematic vision, definition of a network and its place within the system helps contextualize where a network might go. This will be further covered in the Discussion section.

![Network Structure](image)

**Figure 10: Respondent networks and their identified network structure.**

**Lessons from Nature to Guide Network Structures in Society**

Literary research has shown that decentralization in the natural world is essential to success of complex systems. Known as swarm theory, it is intelligence based on the collective behavior of decentralized, self-organized systems. The continued growth of an ant colony is attributed to
the insects’ ability to act in a distributed manner, which only follows a set of rules that helps create a greater, collective intelligence. Without these rules, the ant colony would never be able to create a higher-level order (Johnson 2001). When describing the organized protests at the World Trade Organizations in Seattle, the protestors “explicitly modeled themselves after the distributed, cellular structures of self organizing systems” (Johnson 2001).

Drawing from the success of the Seattle protests and within decentralized structures in the natural world, further research has shown that social networks focused on dealing with a complex issue; like climate change or global capitalism, is best suited to organize in the same manner as the issue. In these cases, it is in a distributed fashion.

”Sustainability is informed in everything we do. It’s a shared comprehensive concept, from environmental to social equity. How can you accomplish this with a hierarchy structure?” – Judy Walton, Executive Director of the American Association of Sustainability in Higher Education (AASHE), on decentralized networks (Walton 2008)

3.1.7 Communication Tools

Effective communication pathways emerged through our research as a significant aspect of a network’s success. All 18 respondents (100%) from Phase I mentioned the Internet, phones, conferences, and face-to-face time as essential communication tools for a network. Three respondents mentioned that regional hubs, which enabled local face time for global organizations, as a key to overall network functionality. By determining the most updated and innovative technology available, compared against user-friendliness and ease of use and efficiency factors, a network can best determine the tools necessary to serve its current communication needs.

Personal Engagement

“There’s no substitute for face-to-face, especially for initial meetings. There’s no substitute for being on the platform.” (Jeanrenaud 2008)

This statement from Jean Paul Jeanrenaud of the World Wildlife Fund’s One Planet Living initiative reflected the responses of interviewees. When surveying the top communication aspect for success, face-to-face time
was of overwhelming importance. Personal relationships were incredibly important in developing a strong, robust network that could proficiently operate on a global scale and span industry and sector. In-person meetings and travel with the purpose to connect supported this multi-disciplinary nature of networks surveyed.

“To share ideas and work together, that initial physical meeting is very important... Once you’ve lined up that initial structure, one can easily follow up with that relationship in other ways, via teleconferencing, etc.”-Thomas Bergmark, Director of Sustainability, IKEA (Bergmark 2008)

Annual and bi-annual conferences were also highly popular means of keeping network stakeholders engaged and connected. Once these relationships were established, a variety of IT tools were useful in facilitating long-distance communication and progress.

**Information Technology Platforms for Success**

A variety of tools are used to facilitate network projects, initiatives and general communication. Emails, conference calls, and video-conferencing were the most popular tools of those interviewed, with many networks also relying heavily on a staff intranet to share documents, resources, best practices, webinars, and general organizational support. For example, a study of environmental non-governmental organizations from McGill University attributed extensive use of virtual tools as key to the success of the organization as well as their capacity to influence climate change policy (Seiber 2006).

Academic, business, and non-profit networks all shared similar communication tool needs, with several networks recently expanding their networking capacity to more advanced communication tools. Necessary tools often depend on the network’s structure, as well as geographic reach. However, regardless of structure or scope, the top goals for network communication success included both effective interactions within a network, as well as the ability to tie a network into its larger societal context. Ultimately, the capacity for communication tools to increase the social efficiency of a network highly influences its rate of success (Dale and Newman 2005). It should also be noted that the scope of the network population sampled was restricted to networks in developed countries, and organizing structures in developing countries may vary from the results
stated above.

### 3.1.8 Positioning and Leverage

A network’s positioning within its field, as well as its ability to leverage its unique organizational strengths, has been found by small NGOs, multinational corporations and global organizations to contribute to its overall success. Yet not everyone interviewed was aware of the best means to achieve ideal positioning. Interview responses to positioning and leverage included:

- Didn’t know (28%)
- Were searching for support in this area (28%)
- Felt they had room to improve (22%)
- Felt they were positioning leaders (18%)
- Had found a unique niche

> “Professionals and academics working in sustainability are out there getting things done and not hanging out on computer networks. Attracting people in this field requires that one’s network really shine and is immediately extremely useful to the individual. We are working in a time-crunch era, attention spans are short, and people will only invest their time in connections that they feel are truly valuable.” (Coates 2008)

### Organizational Size as a Leverage Point for a Network

Leveraging an organization’s scale can be an effective driver of change, and in these cases, size does matter. A competitive analysis of Procter & Gamble (P&G) often focuses on hard outcomes like market share, gross margin, and number of patent applications, but misses some under-appreciated—though critical—strategies that drive P&G’s business. The least understood and most powerful P&G strategy is leveraging its scale (EMM Group 2003). For small organizations, smallness is not an advantage unless it is combined with speed, flexibility, better process, creativity, better consumer insights and stronger brand equity. For large companies, scale itself is not a competitive asset unless it is leveraged with the same level of imagination and purpose that the organization has been able to create.

> Procter and Gamble realizes that leveraging scale is “not necessarily a denial of local knowledge, local culture or local
advantages” (EMM Group 2003).

The timeliness of sustainability challenges is an issue of global concern. Wal-Mart, with over 60,000 suppliers, leverages its scale to drive changes within its supply chain.

Wal-Mart sees “consumers asking harder questions, and retailers making big demands, which is a large part for its drastic move to a more sustainable business model” (Kistler 2008).

Leveraging Organizational Reputation for Network Success

As part of its work with the Marine Stewardship Council (MSC), Wal-Mart is partnering with World Wildlife Fund (WWF) and Conservation International (CI) to make improvements, such as reducing harmful environmental impacts and encouraging support for broader marine ecosystem management and protection activities (WWF 2006). As globally recognized and respected leaders in conservation, Wal-Mart is leveraging the reputations of WWF, MSC, and CI to drive change across its supply chain (Plambeck 2007).

3.1.9 Network Diversity

Cesar Hidalgo, PhD. researcher at the Center for Complex Networks Research at the University of Notre Dame and the Harvard School of Networked Governance, stressed the need for awareness of the potential of a “tragedy of the networks,” in which a network’s natural loss of diversity over time incurs a loss of adaptive capacity, resilience, and innovation (Hidalgo 2008). He stated a careful brokering of collaboration of key leaders and connector personalities could prevent this, orchestrating change in a manner that optimizes network performance in both supporting diversity and preserving crucial network ties.

“Repeated interactions can contribute to the loss of diversity. This is a trade-off that you cannot avoid... Diversity is the key to adaptivity, resilience, and innovation.” (Hidalgo, 2008)

Stakeholders had a ‘preferential attachment’ to networks that shared either similar values or characteristics or those that worked in close proximity to each other. Local or regional networks of stakeholders of general homogenous nature are increasingly popular in the existing field of sustainable development, yet often lack an external link to a greater
network, thus limiting diversity and preventing local, specialized action from connecting with more large-scale change.

“A group with a mixture of motives can be more productive than a group that is the same.” (Rheingold 2008)

The majority of networks sampled, though homogenous or single-issue networks, showed a capacity to maintain awareness of their context on a global scale.

3.2 External Functioning within the System: Network Barriers to Success

Phase II of the interview research produced key findings regarding the specific challenges and barriers to success faced by existing networks in the field of Sustainable Development. Questions focused on external functionality within the network’s field as well as relationships across sectors.

A copy of the questions can be found in Appendix B.

The following barriers were determined based on answers to the questions asked during interviews. The questions in Phase II were created to determine barriers in external relationships. As such, these barriers included:

**Barrier 1: Lack of Awareness**

Seven respondents identified a lack of awareness of their organizational network’s position and function within the field of sustainability.

"We're on the cusp of a huge new industrial revolution where major innovations in areas such as energy, materials, and water are needed so that the earth can sustain a wealthier China and India. Most CEOs aren't noticing macro changes in their business environment because they are focused on short-term quarterly results. They set near term goals and get on with business and in doing so miss opportunities to lead in the new industrial revolution.” – Dave Sherman, Blue Skye Consulting (Sherman 2008)

**Barrier 2: Lack of Clear Definition of Sustainability**
Five respondents identified that a clear definition of sustainability was not understood or implemented in the networks’ purpose and function.

“Business is important, but we want companies to focus on strategically important issues, not just picking and choosing single issues, the 10 principles are a holistic vision.” – Jonas Haertle, UN Global Compact (Haertle 2008)

“How do we take sustainability and enable it to be perceived as something everyone wants?” – Hunter Lovins, Presidio School of Management (Lovins 2008)

“What’s the business case for ending the human race?” – Ray Anderson, CEO Interface (Lovins 2008)

“Top barrier to success is that you can't measure it. When you're in the field developing this massive idea, people are interpreting this on so many different levels...it's very hard to measure impact in all this.” – Wynn Calder, University Leaders for a Sustainable Future (Calder 2008)

**Barrier 3: Lack of Interaction or Collaboration**

Seventeen respondents identified a lack of ability to positively interact and collaborate with other networks in the field.

“We need the mother of all collaborations” – Sara Parkin (Parkin 2008)

“Can we go faster? Yes. Can we do more? Yes. What’s lacking in the sustainability movement is collaboration.” – Jean Paul Jeanrenaud, Director, One Planet Living (Jeanrenaud 2008)

Interestingly, three respondents felt that collaboration was already happening within their networks and in the field of sustainability at a significant level.

“It’s a big thing, it’s a big positive, there’s a lot of collaboration going on. The biggest thing is probably coordination. We’re all moving in the same direction but we have other jobs, priorities, etc.
Maybe we’re collaborating better, using each other’s networks better, it’s happening but we could always do more.” – Catarina Soares, Net Impact (Soares 2008)

Appendix C compiles respondents’ interview feedback in relation to the three existing barriers to network success towards sustainability.

The following discussion describes existing Emerging Sustainability Networks today, the top barriers to success faced by ESNs today, and potential implications to the field of Sustainable Development. Aside from the critical success factors outlined above, barriers to organizational network success emerged as three key themes.
4 Discussion

4.1 Sustainability Networks Today

This research concludes with deeper discussion on and suggestions for how organizational networks can shift from Emerging Sustainability Networks (ESNs) to high performance Sustainability Networks (SNs). Ideally, this is accomplished by strategically addressing internal capacity and external functionality in order to more effectively catalyze sustainability in society.

- **Internal development** can be strengthened through nine critical success factors (CSFs) previously identified as essential to an organizational network’s success (See Figure 12).

- **External functionality** in the field of Sustainable Development can be strengthened by addressing the three key barriers to success: awareness of a network’s context within the larger system of society within the biosphere, adherence to a common definition of sustainability, and collaboration across the field of sustainability.

Backcasting from a vision of a sustainable society, these internal and external assessments provide crucial insights into how an existing organizational network can move forward to establish itself as an ideal Sustainability Network. A core knowledge base of these success factors, combined with an understanding of existing barriers, assists an organizational network in managing change, increasing effectiveness, and strategically planning for success.
4.2 Addressing Internal Development: Critical Success Factors in Practice

An Emerging Sustainability Network with a strong understanding of optimal internal development will allow it to best serve its role within the system. As presented earlier, nine ‘Critical Success Factors’ (CSF) have been established: Vision, Leadership, Resilience, Capacity, Engagement, Network Structure, Communication Tools, Positioning and Leverage, and Network Diversity. These factors are naturally interdependent and interconnected, where improvement in one area positively reinforces other areas.

Due to the interconnections between factors, this study does not seek to weight factors based on importance, but instead seeks to highlight specific areas of importance for network administrators currently managing organizational networks in the field of sustainability. The following section draws from these factors to highlight several common issues that organizational networks face when seeking to effectively drive large-scale positive change.

4.2.1 Utilize Network Structure to Address Complexity

Organizational networks have found great success in using a
decentralized network structure to address the complexity of the issue at hand. The decentralized structure of Global Action Networks, for example, and other large international networks, takes into consideration the fact that strategies that work in some regions of the world may not work in others. As a result, all GANs and successful global networks have structured themselves under a leadership method of governance, which creates an overarching vision and framework while establishing national and local-level network models.

These global networks perceive themselves as “network-of-networks” rather than a central controlling authority, thus increasing their capacity to address complex sustainability issues. GAN national and local networks have a very high level of autonomy and communicate with other national networks to discuss overall governing strategy and key learnings (Waddell 2003).

National and local networks have a stronger understanding of what local challenges are and how best to act on them. By keeping in touch with what is going on globally through their “network-of-networks”, these local networks can enable knowledge sharing when it is valuable, and avoid costly inefficiencies caused by ‘reinventing the wheel’ and duplicating efforts across the field.

The UN Global Compact, the World Wildlife Fund, and the World Business Council for Sustainable Development all operate under this strategy. By comparison, the American Association for Sustainability in Higher Education, the Society for Sustainable Living and Sustainable Business Research Network are all examples of what an autonomous national model could look like.

4.2.2 Ensure Organizational Capacity First

Not surprisingly, most network capacity issues can be resolved by the availability of adequate amounts of money. Network range, time constraints, and organizational demands can be addressed by increasing manpower. However, without the necessary funds, other methods of maximizing participant engagement and network performance must be found.

An ESN that understands network capacity challenges can strategically plan to avoid these issues before it becomes a critical failure factor.
“We can get a lot more done quickly if we can piggyback off others’ networks rather than continually focusing on our own.” – Tom Leathes, Director of Acre Resources (Leathes 2008)

By understanding his organization’s resource limitations and the availability of many established, functioning networks, Leathes is able to avoid halting the growth of the Acre network by utilizing already-established networks. A strong focus on maintaining a clear organizational vision assists a network in prioritizing actions to avoid capacity problems.

“We don’t want to be a mile wide and inches deep” – Judy Walton, Executive Director of AASHE (Walton 2008)

Maintaining focus on the ESN’s core purpose is essential to enabling engagement of the right individual for the network. Through participation of the right people, human resource capacity needs can be met.

Recent online community growth has provided interesting strategies for organizational networks to consider in limiting capacity challenges. Open-source collaborative projects such as Wikipedia have eliminated capacity constraints through the effective use of volunteers working with the same end goal in mind. Effective communication of Wikipedia’s purpose, and an established set of rules that minimized risk and maximized volunteer productivity created the environment for exponential growth.

4.2.3 Addressing the Engagement Challenge

The long-term success of ESNs is only possible with the continued engagement of the network’s members. Participants in a network become involved for a variety of reasons. Additionally, the level of participant engagement also determines how successful the ESN will be and how much resources such as funding it will need to invest. A high participant engagement level maximizes a network’s success while minimizing the financial investment required.

By planning a network that understands the engagement needs of the individual, participation from key individual types in social networks can be obtained. These types of individuals essential to network success include: central connectors, boundary spanners, information brokers, and
peripheral specialists.

The level of engagement covers a broad spectrum. To strategically plan for participant engagement, ESNs must decide which level is needed for success and take actions accordingly (Riches 2005).

### 4.2.4 Network Diversity Supporting ESN Success

Network diversity can be a key factor when maximizing an organization to best address sustainable development challenges. Maintaining diverse and active networks is especially critical in the progressive development of the sustainability field, as the issues involved are often multi-scaled, in which even a local network must have connections to broader societal contexts to grasp the full complexity of the issue. As sustainability challenges in our existing societal context are constantly evolving, a flexible and open engagement process is required, which can only be supported by a diverse network structure. These challenges also require trans-disciplinary solutions, thus mandating the involvement of a wide variety of stakeholders.

The issue of ‘homophily’, in which networks tend to form from similar actors, and become increasingly similar in time, is an important characteristic to examine when addressing the long-term sustainability of an organizational network. Just as functional diversity is critical to the resiliency of ecosystems, it is equally critical to the development of networks.

“As networks have a natural tendency towards diversity loss over time, groups must constantly work to prevent this, in order to successfully engage in sustainable development initiatives” (Dale and Newman 2005).

Homophily, for example, is quite prevalent in social networks. For example, those with shared ethnicity and/or economic class tend to participate in similar activities and social and civic groups. Organizational networks must be conscious of this, and actively manage a network with an emphasis on maintaining diversity while supporting long-term member engagement.

### 4.2.5 Network Positioning in the Field

Network positioning, or using one’s natural or strategic advantages as an
asset is a nebulous issue for some organizations, while others find it a natural strength, especially with the strength of a figurehead or other means of leverage. The Clinton Climate Initiative (CCI), for example, carries the reputational strength of former US President Clinton, who possesses a unique convening power. Leveraging his influence, CCI is able to attract top experts and companies to quickly position itself as a major force in addressing climate mitigation partnerships on both a local and global level (Carstedt 2008).

However, ESNs must consider all factors that will best position themselves for long-term success. Networks can only expect to succeed in the short term by solely relying on the reputational strength of their leader as one respondent commented:

“Joining a network because it has a celebrity leader is like peeing your pants. It’s all warm and comfortable at first and then is just cold and awkward.” (Anonymous, 2008)

4.2.6 Critical Success Factors in Practice: Mapping an Emerging Sustainability Network

How do all these factors fit together in the assessment of an Emerging Sustainability Network? In Figure 13, we present an example of how existing ESNs could be assessed according to the criteria previously used to define a Sustainability Network. Each network is mapped according to its degree of success as a catalyst for sustainable development (upper right hand point in the graph). It is visually quantified by:

- Integration of sustainability into purpose and practice. The size of the symbol representing an individual network is weighted based on the extent to which a network has integrated the sustainability principles into its organizational vision and function (the larger the circle, the higher the integration level. The left hand column in the graph demonstrates the range of integration to sustainability possible).
- Stakeholder involvement, determined by the number of mutually beneficial relationships with stakeholder groups, including academia, business, government, the general public, and the non-profit sector (X-axis).
- Network reach, determined by geographic scope, ranging from a local, regional, national, continental, to a global range (Y-axis).
A review of World Wildlife Fund’s One Planet Living Network utilizing the above criteria demonstrates that it is close to being the definition of a Sustainability Network. The One Planet Living Network includes almost every stakeholder group relevant to its network (thus placed in the far right of the graph), has a global range (placing it high up the y-axis), and operates under 10 guiding principles that closely mirror a complete definition of sustainability (identified by a fairly large circle). When looked at from the context of the Framework for Strategic Sustainable Development and the four Sustainability Principles; however, full consideration by One Planet Living is not given for Sustainability Principle II. For instance, its principles account for mitigating all human produced types of CO$_2$ emissions into the atmosphere but do not give consideration to other systematically increasing concentrations of substances produced by society.

![Defining a Sustainability Network](image)

*Figure 12: Assessing the Current Reality of ESNs Moving Towards a Vision of an Ideal Sustainability Network*

A sustainability network can be a single-issue network or have a small local scope, yet must maintain a high-level awareness of its role and positioning in the field of sustainability. Through this positioning, it enhances the sustainability field as a piece of the puzzle in the ‘network of networks’, providing benefits to both internal performance and external efficiency of the field. The ‘single issue, local network’ in Figure 13 is an example of a small local network that acts independently and does not yet know its place within the whole system.

How is this relevant to an existing Emerging Sustainability Network?
The following set of graphs contains an assessment of several organizational networks interviewed throughout the duration of this research study. These are organized into Non-profit, Business, Academic, and Thought Leader population groups to give a clearer example of how existing networks are functioning with respect to other networks in the field. This method can also help network practitioners determine which organizational networks and sectors may have the highest probability of taking the biggest steps towards the global sustainability challenge in the near future.

![Graph](image)

**Figure 13: Assessing the Current Reality of ESNs in the Non-profit Sector**
Figure 14: Assessing the Current Reality of ESNs in the Business Sector

Figure 15: Assessing the Current Reality of ESNs in the Academic Sector
4.3 Global Network Dynamics

Once ensuring organizational effectiveness, ESN can then facilitate societal change through an understanding of three key themes for networks. With this understanding, the conditions for ESNs will be ideal to enable their transformation into Sustainability Networks. These three themes are:

1. **Awareness** of the network’s position and function within the field of sustainability,

2. **Adherence** to a shared language of sustainability that is both understood and systematically implemented in the networks’ purpose and function, and

3. **Collaboration** and functional interdependence with other networks in the field to effectively drive systematic sustainable change.

4.3.1 Supporting The Field As A “Network-of-Networks”

Data collected from this study provided a clear picture of existing trends within the sustainability field. Emerging Sustainability Networks (ESNs) are rapidly progressing across the globe, pushing societal innovation and change on the local, regional, and international level.
“A typical network...combines the voluntary energy and legitimacy of the civil-society sector with the financial muscle and interest of businesses and the enforcement and rule-making power and coordination and capacity-building skills of states and international organizations.” (Reinicke 2000)

There is no lack of potential in the field, and the ‘law of preferential attachment’, the idea that the more connected a node is, the more likely it is to receive new links (Barabási and Albert 1999), is catalyzing the creation of regional networks-of-networks with increasingly strong fitness, leverage, and reach. Results show that the ESNs willing to act as early adopters and tackle the challenge of embracing a whole-systems framework of Strategic Sustainable Development show the greatest potential to incur a critical mass of networks that will drive systemic change on a global scale.

Biological phenomena, such as bee activity, have greatly informed the scientific community on the dynamics of the collective behavior of decentralized, self-organized systems. Previous research on swarm theory and collective intelligence supports the potential of informed ESNs, working with a global awareness, of their ability to incur change.

“Crowds tend to be wise only if individual members act responsibly and make their own decisions. A group won’t be smart if its members imitate one another, slavishly follow fads, or wait for someone to tell them what to do. When a group is being intelligent, whether it's made up of ants or attorneys, it relies on its members to do their own part. The analogy is really quite powerful.” (Surowiecki 2006)

With informed ESNs functioning within the constraints of their societal system, this collective intelligence has the capacity to incur geographic or cross-sector clustering of networks in response to global sustainability challenges, ideally inciting a critical mass for organized collaboration.

4.3.2 Seeing the “Big Picture”: Geographic and Cultural Considerations

“A sustainable Bangladesh will not look like a sustainable Karlskrona (Sweden)” Karl-Henrik Robèrt (Robèrt 2008)

The field of sustainability has the potential to comprise hundreds, or even thousands of, sustainability networks working together, in a ‘network-of-networks’. How are we to achieve global momentum towards a
sustainable society with such a diverse international community? These individual networks all function within a specific geographic and cultural context, which needs to be taken into account when assessing ideal positioning and leverage across the field.

Many existing networks are very specialized to one specific issue or geographic region, yet directly or indirectly influence a wide range of other networks outside their sector, geographic area, or cultural context. By understanding how their own actions relate at the systems level within the biosphere; they must ensure that they do not undermine any other sustainability issues or networks while working towards their goal.

4.4 External Functionality: Three Shifts to Drive Sustainable Change

4.4.1 Awareness Within The System

Research results have shown that the first factor influencing a network’s success to drive systemic sustainable change is to integrate a whole-systems and cross-sector perspective of the field, embodying self-awareness within the context of the whole field.

This is the case with Wal-Mart, for example. While working towards its primary objective of being the most successful retailer in the world, Wal-Mart has created thirteen distinctive networks across multiple sectors to drive sustainability initiatives that benefit both its own bottom line and the success of its partners and suppliers. (Kistler 2008)

By mapping its links, nodes, and network hubs, an ESN can visualize its relationships through connections spanning society and the biosphere. This knowledge can serve as a means of understanding information flows, strategic positioning, and opportunities for collaboration. It can also identify weaknesses and efficiency gaps.

Once gaps have been addressed and network optimization with a whole-systems perspective is reached, an ESN is best equipped to collaborate with other networks.

Self-Assessment and a Whole-Systems View

The core function of Emerging Sustainability Networks must be
readdressed to gauge where they currently fit into the field and aim to be in the future. If an ESN realizes its function as best suited to local level action, it should position itself to become part of a ‘network-of-networks’ that ensures participation in the governance of the larger network. This loosely organized clustering provides a means of check-and-balance, in which networks can support, evaluate and advise each other on adherence to a shared framework of sustainability. Almost all ESNs from the research population have essentially the same vision of a sustainable society in the future; many have not stepped back and taken a ‘bird’s eye view’ of the issue.

“The blackout crisis was chaotic because no one was taking into account global network behavior. Everyone was following his or her own rules and they were ill equipped to collaborate. This is very similar to the sustainability problem…” – Zoltan Toroczkai, Center for Complex Networks Research (Toroczkai 2008)

Why is it so critical to understand these network behaviors and dynamics on a global scale? Complex issues such as climate change evolve in a distributed fashion across the planet with varying results in every region. Since variables can be contributing factors in various geographic regions, ecological changes and severity can also differ. As a result, local and national organizations are established to take action against external pressures within their existing environments. When looking at the ultimate source of a sustainability challenge like climate change (i.e. anthropogenic increases of atmospheric greenhouse gases), action must be taken at a global level to achieve results.

*Act Locally, Think Globally*

Local activity needs to be tied to an understanding of the network’s role within the whole system as a way of mitigating potential negative effects of their activities on other regions as they progress towards similar goals. For instance, a local network working on bio-fuel development needs to be aware that its actions may adversely affect the availability of food in other regions.

As variability within regions demands local organizational ability to respond and take action, an ESN must ensure that the main portion of power lies within the national and local levels. This need calls for a decentralized network structure as well as an awareness of societal system
constraints.

With a decentralized network structure, an ESN influences the field as part of a network-of-networks for the field of sustainability. This network-of-networks is governed by all ESNs, setting the overall vision, adherence guidelines, and facilitating knowledge sharing among regional networks, that evolves in response to changes in the system.

Once the network-of-networks for the field of sustainability has established a guiding framework that all regional, national, and local networks to follow, it is then able to take on a supportive role. This creates an atmosphere that is ideal in which each individual network can operate, aware of everything else going on around it in the biosphere.

4.4.2 Shared Language For Sustainability

For cross-sectoral success towards sustainability, ESNs need to function using a shared language for sustainability based on scientific principles.

“We can’t assume we are all on the same page; we could be promoting sustainability in themes that are making things worse. Not all of us understand the biophysical situation.” – William Rees, founder of the Ecological Footprint (Rees 2008)

“The central challenge in the field of industrial ecology is expanding its boundary to make it more useful – while still retaining it’s definition. If it becomes everything related to environment, it’s nothing. If it’s everything, it has no identity.” – Reid Lifset, Chief Editor, Journal of Industrial Ecology (Lifset 2008)

“There is a great need for knowledge sharing and dissemination.” – Joel Makower, founder, Greener World Media (Makower 2008)

By implementing a whole-systems strategic planning methodology that clearly illustrates this common understanding, ESNs can ensure a clear and shared definition of success.

Simplicity Without Reduction

The Framework for Strategic Sustainable Development (FSSD) enables organizations to proactively operate within the system boundaries using a shared language for sustainability without requiring a need to understand
every detail. This concept of “simplicity without reduction” refers to understanding a complex system through a set of scientifically based principles, making it easier to contextualize the interactions and complexity of the entire system without neglecting important details (Broman, Holmberg, Robèrt. 2000). This type of analysis begins at a low level, where the level of complexity is less detailed, as opposed to beginning at a level of detail where links to the principles of the system can be vague and difficult to discern. This method takes into account the inherent complexity of systems, rather than ignoring this reality.

In complex systems it is virtually impossible to track every detail simultaneously, which explains the standard practice of studying only a few details at a time while making assumptions about—or ignoring altogether—higher-level details. By using first-order principles as a starting point, the boundaries of the system can be defined so that a more detailed view of the system can be examined without ignoring the boundaries, or higher-level details (Broman, Holmberg, Robèrt. 2000). The principles, in this case, are the unifying ideas shared by every player that then determine the players’ effectiveness within the system. (Broman, Holmberg, Robèrt. 2000).

**Principles, Decentralization and Collective Intelligence**

By respecting the laws of nature, anthropogenic processes in the biosphere can be mitigated. Through established principles that do not violate the local and whole system, ESNs ideally serve two functions as:

1. A part of a ‘network-of-networks’, providing governing support, knowledge sharing, and a component of the medium for other organizational networks to function within

2. An independently focused network tied the greater network of the field.

The guiding framework and shared language of FSSD over a decentralized network structure has parallels to occurrences within nature. Similar to swarm theory, the collective intelligence found in animal and insect colonies, natural order and functional interdependence determine the success of the colonies, and has many potential applications in a societal context. For instance, ant colonies exist in a leaderless society where the collective intelligence is greater than the individual ant. An ant’s instinctive ability to read patterns in pheromone trails and understand
simple messages provides the framework necessary to create a higher-level order and collective intelligence.

Decentralized decision-making following natural laws and communication enables a large population of independent organisms to operate as a cohesive and effective unit (Johnson 2001). A colony would not be able to function without a shared understanding of these guiding natural principles. Without specific natural laws in place, individual ants would spend their time on activities with no understanding of their benefit to the colony, as ant colonies have no form of leadership and a very limited ability to communicate (Johnson 2001).

This swarm intelligence is not unique in the natural system to only ants. Cellular structures of self-organizing systems, bees, birds, and fish all follow a decentralized, distributed decision process. Through trial and error, evaluating all alternatives, and a natural form of governance, swarm intelligence has been found to be the most effective way for large populations to address complex issues (Johnson 2001). By adhering to a framework of simple rules, each organism in the population can make decisions based on the local information available, as more individuals come to the same conclusion; the best solution emerges from the group.

Sustainability networks can best organize and function in similar—essentially leaderless—decentralized manner, utilizing collective intelligence. By using an established framework of guiding principles, SNs can establish themselves as a system in which their participants can freely grow and evolve under the Framework for Strategic Sustainable Development. This allows for the best chance of adherence by sustainability networks to a common language and principles.

This shared knowledge base also serves as a base from which to push and expand the current boundaries of the field. By supporting the field as a network-of-networks, SNs are essentially defining the system boundary of the field, pushing systemic change by the very definition of the field.

“The central challenge in the field is expanding its boundary to make it more useful – while still retaining it’s definition. If it becomes everything related to environment, it’s nothing. If it’s everything, it has no identity.” – Reid Lifset, Chief Editor, Journal of Industrial Ecology (Lifset 2008)
While bees and ants may be able to function with a limited understanding of their impact on the whole system, humans cannot; awareness of the self, the system and the big picture must be considered and understood. A shared definition of sustainability based on scientific principles with will lead to overcoming the final barrier—collaboration.

4.4.3 Collaboration Across The Sustainability Field

“Companies inspire each other. It’s great to have that confirmation that we’re not the only one.” – Thomas Bergmark, Head of Sustainability, IKEA (Bergmark 2008)

A consistent barrier observed in this study toward achieving systemic change was the capacity to collaborate throughout the field. One of the key themes emerging from our research was the concept of ‘functional interdependence’, in which organizations naturally benefit simply by functioning in a collaborative manner.

“This symbiotic organizational interaction is a natural occurrence throughout society, but is greatly enhanced by strategic positioning by participating network administrators.” (Wenke 2008).

A High-Level View

High-level functioning network-of-networks requires a systems-level awareness of other networks and an organization’s role in the greater context of the sustainability field. With an understanding of where each network fits with the system, the goal of moving towards a sustainable society in line with the sustainability principles can be realized through collaboration with other networks.

“Networks already exist. You need to recognize existing collaborative and network relationships, and determine how to better organize smaller existing networks into a broad fully functioning network. The value of a broad fully-functioning network is in the realization of network members that they have shared interests and missions, and may continue indefinitely to realize new value-adding relationships and opportunities through the network.” – Alex Lackner, Concurrent Technologies Corporation (Lackner 2008)

Increased Efficiency and Effectiveness
Through collaboration, partnership, or natural clustering, networks can function as a highly efficient entity within the system to drive sustainability. Leveraged properly within the context of SSD, these networks can drive sustainable development through strategic partnerships and collaboration.

“We don't get much done talking to ourselves.” – Wood Turner, Climate Counts (Turner 2008)

The main weakness in the sustainability field is a lack of coordination and effective interaction with other organizations. For example, the non-profit sector yields a wide gap between organizations addressing societal issues such as poverty, social justice issues, and public health, and organizations addressing environmental issues such as biodiversity and natural resource conservation. These two divisions are critically interdependent, yet these disciplines offer each other little interaction. When perceiving sustainability from a whole-systems perspective, this link is highly evident.

“So society can’t achieve progress in the field of sustainable development without a healthy environment and a diverse, natural world”. – Jean Paul Jeanrenaud, Director One Planet Living, WWF (Jeanrenaud 2008).

“We don't get much done talking to ourselves.” – Wood Turner, Climate Counts (Turner 2008)

Creating Opportunities for Boundary-Spanning Engagement

There exists a wide range of opportunities to engage and organize practitioners across industries to converge around sustainability challenges. Problem-centered entities are often quite successful when engaging diverse stakeholders. It is far easier to engage a diverse group when handling one specific concrete challenge. (Lifset 2008) We also found a core value set and passion behind networks as a strength when bringing together a wide range of stakeholders. As Alex Steffen states, Chief Editor of WorldChanging.org, the values and dedication of the core staff helps to attract and retains their network.

“We have a vast network of small interactions. Why do people engage in this network? We stay out in front of the debate, and do
our work with integrity and passion.” (Steffen 2008)

The key is the ability to orchestrate these engagement initiatives and partnerships in a way that fosters the greater purpose of the field.

“What at one time were numerous un-associated networks will increasingly become collective global governance forums in which the global social contract will be in ongoing development and implementation. (This network-of-networks) will function not as a set of distinct directives from the top down, but as a fluid system addressing problems and opportunities.” (Waddell et al, 2006)

The potential exists; we just need to tap into these opportunities.

“There is a huge opportunity for more networking, community-building, and information exchange across fields.” (Steffen 2008)

“There is a challenge is to engage an ever-broader group of business people- not just green-minded professionals, but people in facilities, procurement, product design, human resources, finance, communications, etc. We need everyone to play.” – Joel Makower, founder, Greener World Media (Makower 2008)

“There is a power in networks, there is a power in working together.” – Nnaemeka Okochi (Okochi 2008)

These key insights into barriers for collaboration across the field bring up the question of real-world application. How can network administrators currently apply this knowledge? The following section outlines key learnings specific to practitioners utilizing networks in the field of Sustainable Development.

4.5 Strategic Network Planning towards a Sustainable Society

4.5.1 Practical Application of Research Findings

There is great potential for the application of this research for a wide range of practitioners, academics, and industry leaders across various sectors that are both involved in and committed to moving forward the field of
Sustainable Development.

Strategic implementation of these recommendations will help Emerging Sustainability Networks transform to true Sustainability Networks that effectively facilitate sustainable change.

- As a first step, ESNs must possess the structural integrity based on the identified Critical Success Factors. These nine CSFs create the structure for a network by which it can then effectively function within the whole system.
- As structurally sound networks working in their respective fields, ESNs need to create a whole systems awareness of their position and function towards sustainability. This awareness of their place in the field of sustainability will further the move towards potential collaboration.

Without a common understanding and adherence to a shared language of sustainability, there will be limited potential for systematic strategic collaboration. Adherence to a shared language of sustainability, based on whole-systems understanding, will bridge the themes of awareness and collaboration. This shared language will create a common thread that will allow networks to effectively drive systematic sustainable change.

Highlighted research findings include:

1. Networks best function as **interdependent, decentralized structures**. A Sustainability Network with clusters of interactive regional activity can be highly effective in addressing a global environmental challenge such as climate change or deforestation.

2. Leadership is a key factor of a successful network, yet in **increasingly non-traditional roles**. Catalyst or facilitator leadership has been proven as a highly successful management style.

3. Engagement is crucial in determining the success of a network. Networks, after all, are comprised of people, and a network must **create inherent value and relevance** in order to successfully attract and retain a highly engaged group of individuals.

4. A network must have a **high-level awareness of its context, positioning, and potential leverage** in the field of Sustainable Development. Isolated, independent functioning
without strategic interaction with other networks greatly limits a network’s potential for affecting large-scale systemic change.

5. Network administrators would benefit greatly from **an increasingly shared definition of sustainability**. With mixed messages of sustainability in media and advertising so widespread in current markets, finding a definition from which to plan strategically can be incredibly frustrating and challenging. This research suggests a definition as defined by the Framework for Strategic Sustainable Development.

6. Collaboration in the field is crucial to expanding a networks’ potential for success. Applying the notion of ‘**functional interdependence**’, this research suggests a network administrator organize and create naturally complementary and strategic partnerships with the larger objective of supporting the field as a ‘network-of-networks’.

### 4.5.2 Application of the Five-Level Planning Model

How do these key findings interact and fit together within a network’s established vision of success? The key to network success and its ability to adopt these findings really hinges on a network’s ability to plan strategically with a whole-systems approach. Using the Five-Level Framework as a planning tool, the following section outlines how these recommendations fall into a strategic planning process.

**The Five Level Planning Model:**

1) **SYSTEM**: Understand your network’s role as a part of society within the biosphere, and the constraints of this system. Are you using a whole-systems perspective to then identify your ideal positioning in the field?

2) **SUCCESS**: Do you have a clear vision of success based on a scientific definition of sustainability? We recommend the Framework for Strategic Sustainable Development as a common platform from which to build consensus.

3) **STRATEGY**: Are you implementing your network vision guided by the Framework? Are you using the Nine Critical Success Factors to inform your planning process?
4) **ACTIONS:** Do your actions support your vision? Are you positively contributing to the development of the field while functioning within system constraints?

5) **TOOLS:** What communication, planning, and network visualization tools are you using to support your success?

This planning tool can greatly assist network administrators in practically applying the knowledge gained from this research study. The authors have attached a guidebook for network administrators to provide a deeper understanding of the application of the Five Level Framework as a strategic planning tool. This guidebook provides a user-friendly set of best practices to assist network administrators in planning for success.
5 Conclusion

Implications in the Field

The results of this study provide a comprehensive understanding of a Sustainability Network (SN) by taking a birds-eye, whole system view of the networks that are needed to drive sustainability in society. It describes the critical factors relevant to the success or failure of SNs, as well as the complex dynamics of Emerging Sustainability Networks (ESNs) currently existing in the field of Sustainable Development. An understanding of connections across industries in terms of Sustainability Networks, with a particular focus on the potential of Existing Sustainability Networks, gives a practitioner in the field a renewed perspective on Sustainable Development’s unique challenges and opportunities.

Other applications of network science include a collaborative project with the Center for Complex Networks Research at Notre Dame and the Harvard Center for Networked Governance. This initiative involves both physicists and economists to greater understand the complexities of international product export networks. Although not involving a scientific grounding in sustainability principles, this is another exciting step towards merging fields for collaboration utilizing network science and other disciplines (Hidalgo 2008).

*Figure 17: Evolution of Organizational Networks towards Sustainability.*
The potential for existing organizational networks as drivers of sustainable development is only growing. As Paul Hawken states in *Blessed Unrest*, “Their effectiveness to prevent harm and institute positive change is undermined by the lack of a collective awareness, duplicative efforts, and poor connectivity. A widely diverse network of organizations is the best defense against injustice, but to be effective, it needs to be connected and intelligent. What is missing is a map…of this network, that includes the resources for communication and cooperation, created and managed by the community…in essence, an infrastructure through which to coordinate our efforts.” (Hawken 2007)

With network science as a very young emerging body of research, and the field of Sustainable Development is growing exponentially as we speak, practitioners in the field are approaching an unprecedented opportunity for global systemic change. As Noam Chomsky commented, this research is just the beginning.

“The world is proceeding in many directions, and the question is, can we imaginatively and constructively explore and develop the ones that are valuable?” – Noam Chomsky, MIT (Chomsky, 2008)

**Future Research**

In a world growing increasingly complex and increasingly interdependent, it is even more imperative that existing networks have the perspective and awareness of their larger context. As industries merge and collaborate to move forward social, technological, and scientific tools and methodologies, a networks perspective grounded in the Framework of Strategic Sustainable Development proves highly valuable to all participants in the field. Shared language, understanding, and strategy will set the best conditions for success in dealing with the sustainability challenge.

The scientific framework provided to ground the establishment of Sustainability Networks has a multitude of untapped potential applications. This study is one in many very preliminary applications of the Framework of Strategic Sustainable Development to the field of Sustainability. Future research topics to be pursued by masters students at the Blekinge Institute of Technology and other universities may include:

- Sustainability Networks within a specific industry, such as clean tech investing or urban infrastructure development
• Sustainability Networks and Knowledge Management: Disseminating Information for a Sustainable Future

• Sustainability Networks and Community Planning

• Sustainability Networks as Support Structures for Influencing Public Policy

• Sustainability Networks and Social Entrepreneurship: Connecting for Social Change

• Sustainability Networks and Technological Innovation: How Social Tools are Changing How We Connect

• Sustainability Networks in the Field of Industrial Ecology

This research does not recommend the establishment of a global ‘super-network’, but instead seeks to support the field of Sustainable Development as a ‘network of networks’. With this whole-systems perspective of such a broad, multidisciplinary field, this study concludes with strong recommendations for further research. This body of research is only the beginning of a wide range of potential applications, and the research team of the Blekinge Institute of Technology in Sweden is both excited and committed to these prospects.
References


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## Appendix A: Interview List

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<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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<tr>
<td>Alex Lackner</td>
<td>Concurrent Technologies Corporation</td>
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<td>Alex Steffen</td>
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<td>Andrew Outhwaite</td>
<td>Independent Consultant</td>
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<tr>
<td>Andy Mangan</td>
<td>United States Business Council for Sustainable Development</td>
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<td>Bea Buyle</td>
<td>P&amp;G Sustainability</td>
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<td>Bill Wiehl</td>
<td>Google</td>
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<td>Bob Willard</td>
<td>Author, <em>The Sustainability Advantage</em></td>
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<td>Caterina Soares</td>
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<td>Cesar Hidalgo</td>
<td>Center for Complex Networks Research at Notre Dame, Harvard School of Networked Governance</td>
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<td>Clinton Climate Initiative</td>
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<td>Gregg Behr</td>
<td>Grable Foundation</td>
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<td>Howard Rheingold</td>
<td>Author, <em>Smart Mobs</em></td>
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<td>Hunter Lovins</td>
<td>Presidio School of Management</td>
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<td>Jean Paul Jeannreaud</td>
<td>WWF, One Living Planet</td>
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<td>Jeanfrancois Barsoum</td>
<td>IBM</td>
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<td>Jiri Dlouhy</td>
<td>Director of Environment, Charles University, Prague</td>
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<td>Jiri Dlouhy,</td>
<td>Sustainable Living Forum, Czech Republic</td>
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<td>Joe Laur</td>
<td>SOL Sustainability Consortium of the Society of Organizational Learning, Greenopolis</td>
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<td>Joel Makower</td>
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<td>John Coate</td>
<td>San Francisco Gate, WELL Community, Electronic Frontier Foundation</td>
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<td>Jonas Haertle</td>
<td>United Nations Global Compact</td>
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<td>Judy Walton</td>
<td>Association for Advancement of Sustainability in Higher Education</td>
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<td>Karl-Henrik Robèrt</td>
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<td>Lief Utne</td>
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<td>Wynn Calder</td>
<td>University Leaders for a Sustainable Future (GHESP)</td>
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Appendix B: Interview Questionnaires

Phase I:

Sustainability Network Questionnaire
For the thesis titled:

“What are the critical success factors of sustainability networks?”

Programme: Masters in Strategic Leadership towards Sustainability
School: Blekinge Institute of Technology, Karlskrona, Sweden
Students: Molly Doyle, Dermot Hikisch, Shawn Westcott
Contact: dermco@gmail.com

Name of participant and position:
Institution:
Email or Phone Number:
Date:

GENERAL INTERVIEW:

1. What is the structure of your network? Do you follow a business model inspired by another network?
2. Is there a vision, stated purpose, and guiding principles holding all this together? How important is this? Do you use a shared language?
3. What defines success for your organization's network?
4. How important is face time? If not, what factors or communication tools do you need to stay connected?
5. What are the main reasons people engage and remain engaged in this network?
6. Describe the leadership role in this network.
7. Are there any capacity or growth constraints to this network? Are there any other long-term barriers that should be addressed?

ACADEMIC/PROFESSIONAL/NGO NETWORKS:

1. Describe your organization’s networks. What are the existing networks & their function?
2. What do you feel is your most valuable network(s)? Why are they
crucial to your work?
3. Thoughts on the current state of the global non profit sustainability field: Where are the gaps? What are the strengths/weaknesses?
4. Other comments:

Phase II:

Organizational Networks as Change Agents for Strategic Sustainable Development

Interview with:
Organization:
Date:
Phone Number:
Thesis Team:

Molly Doyle, Dermot Hikisch and Shawn Westcott
Masters Candidates in Strategic Leadership towards Sustainability
Blekinge Institute of Technology (Karlskrona, Sweden)

Thesis Topic:

Based on preliminary research of the landscape of the sustainability field, it can be determined that great potential exists for networks to leverage themselves as powerful and effective drivers for sustainable development. With respect to the unique challenges of organizational networks in the sustainability field, this study will be exploring the following questions:

Research Questions:

How can organizational networks act as catalysts for sustainable development?
   • What key factors are critical to the success or failure of an existing and/or emerging organizational network in the sustainability field?
   • What are the current barriers to success for networks in the field?

Interview Questions:

1. How would you describe your organization’s existing network for sustainability? Who are the key players? (Stakeholders, external experts, strategic partnerships, etc)
2. What defines success for your network?
3. Is sustainability communicated internally among staff as
organizational values? Does the staff share a common definition/understanding of sustainability?

4. How is sustainability communicated externally? (Either via marketing or work with external clients, stakeholders, etc.)

5. What is your organization’s largest barrier/challenge to achieving results in sustainability? How is this addressed?

6. What are the main reasons people engage and remain engaged in this network?

7. Are you currently working with other experts or networks related to sustainability? If so, in what capacity?

8. What do you feel are the largest barriers to collaboration in the field?

9. Thoughts on current/future trends in the sustainability field: What do you perceive are the opportunities? Challenges? Gaps in the field?
Appendix C: Barrier Identification

Responses to Phase I and Phase II of the interview process were screened to determine respondents’ feelings towards the barriers to success for the field of sustainability. Specific questions asked are found in Appendix B. Red meant that the theme (awareness, adherence, and collaboration) was believed to be a barrier for the respondent, green for not being a barrier, and orange was a maybe.

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Appendix D: The Academic Sector: A Case Study of University Networks for Sustainable Development 1990-2008

Context

Recent experience in the academic world holds insights into organizational network development. As some of the first organizations to respond to the sustainability challenge, universities and colleges around the world were among the earliest to act on the global sustainability movement, forming research networks related to sustainability.

This early adoption came about through a number of factors; for instance, academia was among the first to become aware of new environmental scientific data and its implications. As campuses exist with a focus on knowledge and developing solutions, university members were quick to develop a concern and passion to act on sustainability. Additionally, universities function more or less in isolation from the rest of the world; consequently, they are able to act in an experimental and trend setting fashion. Finally, a high level of resource support available within the university sphere also created a more suitable environment for sustainability related networks to develop than in other industries and groups. These early experiences into networks for sustainability have lead to several successes or failures that the rest of the world can learn from.

History

Cross-campus collaboration on Sustainable Development began shortly after the 1987 UN Brundtland Commission report. The Talloires Declaration (TD), composed at an international conference in 1990, is the first official statement made by university administrators of a commitment to environmental sustainability in higher education. The Talloires Declaration is a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities. This Declaration called on universities around the world to join as a signatory stating their concern for state of global Sustainable Development.

In 1992, an organization was established to administer the Talloires Signatories and create the beginnings of this first academic network for
Sustainability. The University Leaders for a Sustainable Future (USLF) was the result of this early organization in 1995. The USLF had a purpose to facilitate University Signatory members and create an avenue for communication and collaboration. By 2000, the USLF was composed of signatories from over 350 of the world’s leading universities and over 40 countries.

Around the world new organizations formed to in response to university demand to provide support and guidance to interest in new international agreements such as Agenda 21 (1992) and many others that followed. Some of the larger organizational networks included: Copernicus Campus, which was composed of 306 universities in 2006, all from 37 European countries and signed onto the University Charter for Sustainable Development (1993), and the International Association of Universities (IAU), a branch of the United Nations Educational, Scientific & Cultural Organization (UNESCO) who oversaw more than 650 universities which had officially adopted the Kyoto Declaration on Sustainable Development (1995).

In 2002, the United Nations announced the Decade of Education for Sustainable Development (DESD) from 2005-2012. UNESCO was the designated lead agency for the DESD and created an International Implementation Scheme. Part of the implementation was a partnership with the ULSF, IAU, and Copernicus-Campus to bring over 1000 Universities together under one umbrella of collaboration called the Global Higher Education for Sustainability Partnership (GHESP).

GHESP was established with a vision of collaboration towards SD. The rationale for the partnership was the consensus that higher education must play a central role within the overall process of achieving sustainable development. GHESP included every major academic institution on the planet and had the capacity to become a ‘network of networks’ for the academic world. It had 5 main objectives to promote better understanding, undertake a global review and assessment of progress, identify share and disseminate widely, make recommendations based on partnership research, and demonstrate that it is possible to form a partnership of NGOs working closely with the UN system. To ease management challenges each of the four leading organizations in the partnership were placed as heads for geographic regions that the majority of their university members were located.
UNESCO identified some challenges that could limit the success of the DESD and the GHESP network in 2004. The main ones being: a limited source of funding to meet the high demand for support from local, national, and regional initiatives; and the huge task of bringing all interest groups to the table, building effective collaboration and engagement between sectors and institutions, and instilling a collective sense of ownership and responsibility was an immense task (Calder 2005).

Through its centralized hierarchical structure, this partnership became involved in a number of endeavors such as: participating in the UNDESD planning process, producing resources for universities to use, and hosting conferences. Given the huge scope of the network and limited capacity and resources of the leading organizations, they were not able to be everything to everyone.

Areas of weakness in the partnership and individual organizations created a suitable environment for newer, more innovative networks to emerge to the forefront. Net Impact was founded in 1993, as a network of MBA students addressing the need for increased communication between business schools regarding issues of sustainable development. Originally beginning in the USA, Net Impact has now grown to include over 10,000 MBA students, practitioners, environmental graduates, and business undergrads across six continents. The need for timely and helpful information coupled with the rapid growth of the Internet created many grassroots academic networks. The Brown University Sustainable Development listserv is one of the most successful behind the scenes academic networks to form in this manner. With virtually no guiding principles and leadership, the Brown listserv has emerged as a go to source for campus sustainability practitioners looking for advice and insights on virtually any SD topic. Members can freely post their questions and requests online to receive valuable insights from their peers.

The Research Network for Business Sustainability (RNSB) was created in Canada as a national research network in 2006. Devised as a method of moving beyond the ‘elitist’ world of academia, RNSB works to cross disciplines and industries for cross-functional collaboration, enabling academic research on SD to be more relevant to business. The RNSB model hopes to eventually have its national structure replicated throughout the world. AASHE is another national network with a similar global outlook as RNSB. Founded in 2006 with a mission to promote sustainability in all sectors of higher education - from governance and
operations to curriculum and outreach - through education, communication, research and professional development. In addition to universities and colleges, businesses, NGO's, and government agencies all participate as AASHE partner members.

At an AASHE conference in October 2006, 12 university leaders joined together to form a founding leadership circle and launch the American College & University President’s Climate Commitment (ACUPCC). The ACUPCC differed from the Talloires Declaration in a number of ways, being 16 years newer and focused on growing concerns over climate change, the commitment was met with fresh and invigorated eyes from many institutions. However, most importantly, the ACUPCC had a primary focus on implementation and accountability, something dearly lacking from the Talloires Declaration and many other older agreements. The ACUPCC had ‘teeth’ and focused on gaining buy-in from the highest position within each academic institution. By March 31 2007, 152 presidents and chancellors had signed on with 3,500 more being asked to join.

In December 2007, the GHESP was up for its four year review. The partnership quietly disappeared without much notice. Shortly thereafter, Europe’s leading organization, Copernicus-Campus also closed its doors, leaving its 308 university members without a network in this area. With over 4 years still left in the DESD, it is still uncertain whether the decade of education for sustainable development will be viewed as a success or a failure. The emergence of new academic networks for SD and the failure of GHESP provided some valuable insights for emerging networks for sustainability.

Key Lessons

“Lack of engagement”- The Global Higher Education for Sustainability Partnership failed to engage its 1000+ university members. Decisions were made by the four leading organizations and there was not a strong platform or strategy to involve participating universities at the level that they had hoped. Additionally, access to timely information was limited and often not relevant to each institution’s own challenges or region. The Brown University Listserv and nationally focused network models provides examples of solutions that have developed to address this problem.

“Accountability challenges-no teeth”-Within the academic world and
society as a whole, agreements such as the Talloires Declaration and Kyoto Protocol ‘lost steam’ over time as it became increasing apparent to participants and potential new members that they had an overall lack of accountability and method to enforce non-compliance by an institution. Newer agreements are now being made with mechanisms in place to ensure that ‘talk’ becomes ‘action’ and all activities are conducted in a transparent manner.

“Lack of self awareness as a network and power held within the network” - The leadership of the GHESP maintained the view that they were solely existing as a ‘partnership and missed the concept that they were in fact a network. Potentially the strongest network for SD among academic institutions created to date. By not embracing itself as a network, the GHESP inadvertently halted member engagement opportunities and stopped growth, effectively sealing its own fate. The recent blurring of the lines between organizations and networks has allowed corporations, universities, and organizations succeed past the boundaries defined in their own organizational charts.

“Resource constraints” - capacity and financial constraints limited the reach of the GHESP, reduced their ability to serve the needs of members, and prevented any sort of enforcement for non-compliance to be considered.

“Barriers- ‘elitist’ - walls to entry within the community” - by being focused on essentially on one stakeholder group, many organizations were deterred by this method as an understanding that the sustainability challenge was everyone’s problem developed. Considering AASHE, the creation of an inclusive stakeholder environment has been critical to its success and the level of engagement that it achieves.

“No cross disciplinary or cross industry applications” - without a wide variety of stakeholders included from various backgrounds and industries, addressing the sustainability challenge was only able to be looked at from one angle in the GHESP, this limited innovation, creativity, and created capacity constraints for member institutions as they had be a part of many other organizations to be fully functional towards SD. The RNSB has been able to take academics out of their ‘silos’ and expose them to the real world. Cross-functional collaboration has helped develop a better understanding for what is needed and what can feasibly be implemented.

“Centralized model” - The GHESP model was vulnerable to a full network
failure under a centralized model. After one or two individuals lost interest, the challenge of maintaining a ‘network of networks’ was too much for the few remaining leaders. Modern global networks such as GANs maintain resilience through their distributed nature. Acting simply as facilitators, even a large breakdown within the central organization will not destroy the whole network as each participant is in direct contact with one another, sharing information and participating the decision making process. Even at a national level, a decentralized structure is beneficial. For instance, AASHE oversees the entire United States, but understands the subtle differences between each region and individual and lets the network run as efficiently as possible in this manner.

“Lack of collaboration, differing leaders with differing agendas”-Although a common mission and principles were established amongst the four leading organizations of GHESP, differing priorities, levels of involvement, and personal ability to work with one another created suitable conditions for failure within the partnership. With only four key groups making the main decisions, complete collaboration among the top level was essential. Had this leadership platform been spread across the entire 1000+ members, individual differences would have been minimized, the collective intelligence and cooperation of the majority would have prevailed being too strong for the few to disrupt the network’s overall mission and values.

The GHESP had an understanding of more than a few of these challenges before proceeding. Many strategies were established to address some of these challenges; however, through a lack of implementation, likely caused by limited collaboration among leadership, the partnership ultimately failed. Awareness of all the critical success factors is a crucial first step. Lacking full implementation towards these factors, a network will function at a limited capacity. Without internal cohesion between a network’s participants, it is likely to eventually fail.
Appendix E: The Business Sector: A Case Study of Wal-Mart’s Sustainability Initiatives

Context

Conventional wisdom informs us that businesses are rewarded for innovation and smart tactics that place them above the competition. Finding a way to leverage new technologies or new methods usually proves a strategic advantage and results in market leadership. Wal-Mart Stores Inc. is an American corporation that runs a chain of large, discount department stores. Wal-Mart is the world's largest public corporation by revenue (Fortune 2007), the largest private employer in the world and the fourth largest utility or commercial employer. It is also the largest grocery retailer in the United States, with an estimated 20% of the retail grocery and consumables business, as well as the largest toy seller in the U.S., with an estimated 22% share of the toy market (Hoovers 2008). To remain the top retailer, it has been a leader in practices that reduce costs and provide a strategic advantage over its competitors.

With such an expansive business, the company’s supply chain is massive. Wal-Mart’s U.S. stores alone buy from more than 61,000 suppliers in more than 55 countries around the world. Wal-Mart’s significant size and reach makes its potential to drive sustainability across its entire business network a reality. Wal-Mart’s move to embrace sustainability in its business model in 2005 has created a ripple effect throughout its supply chain, affecting business worldwide. With thirteen networks in the United States, alone, each network comprises Wal-Mart associates, suppliers, NGOs, governmental organizations, universities and other thought leaders in the specific network area (Kistler 2008).

By embracing a strong understanding of its network, innovative practices and smart tactics, it is quieting many skeptics and driving sustainable change across sectors, proving that there is indeed “power in numbers” (Kistler 2008). As Wal-Mart’s chief of sustainability, Matt Kistler, pointed out, “Sustainability doesn’t win by mandates; it wins via competition to be the best and by racing to the top. “Sustainability is just business as usual.” (Kistler, 2008)
History

The practices of Wal-Mart have often been scrutinized from both a social and environmental standpoint. So in October 2005, Wal-Mart CEO Lee Scott surprised company observers by embracing sustainability in a speech announcing ambitious initiatives on “all the issues that we've been dealing with historically from a defensive posture” (Baue 2005). Scott announced that Wal-Mart was launching a sweeping business sustainability strategy to dramatically reduce the company’s impact on the global environment and thus become “the most competitive and innovative company in the world.” He argued that, “Being a good steward of the environment and being profitable are not mutually exclusive. They are one and the same.” He also committed Wal-Mart to three goals: “To be supplied 100 percent by renewable energy; to create zero waste; and to sell products that sustain our resources and the environment” As Matt Kistler pointed out, Wal-Mart’s sustainability vision has been “built on Lee Scott’s two speeches” (Kistler 2008).

Wal-Mart’s efforts to accomplish this focused on three of the company’s primary focus areas (seafood, electronics, and textiles) and their effect on the company’s operations, supplier relationships, and results. Wal-Mart then set out to explore to best measure and communicate its ideas about sustainability to its suppliers, associates, customers, and the public, understanding that this new sustainability strategy would need to be deeply embedded in Wal-Mart's operations and supply chain management to meet the 2005 goals (Plambeck 2007).

Working with Blu Skye Sustainability Consulting, the company identified the categories of Wal-Mart's products and processes that had the greatest environmental impact. Looking at environmental impact factors from the Union of Concerned Scientists and internal sales data with, 14 focal areas were identified, which were divided into three general categories: renewable energy; zero waste; and sustainable products (Figure 1). For each focal area, an executive vice president and a “network captain” (typically a senior vice president) took charge of building a sustainable value network of Wal-Mart employees and representatives from government, academia, environmental nonprofits, suppliers, and other stakeholders (Figure 2). Network captains, typically senior managers, were charged to look outside of the company for strategic input and asked to start pulling ideas from everywhere, even from critics (Plambeck 2007).
Wal-Mart strategically decided not to hire associates—employees—to work on sustainability on a full-time basis, but instead to embed sustainability in their daily work (Plambeck 2007). To help make that lean model viable and because Wal-Mart lacked internal expertise in environmental sustainability, the company hired one or more external advisors from Blu Skye or Rocky Mountain Institute for each network.

(Source: Plambeck 2007)
Hesitantly, environmental groups, like Sierra Club, joined the networks, but these groups decided that the advantages of being able to help influence Wal-Mart's environmental performance outweighed any negative repercussions from the association (Plambeck 2007). Seeking the opportunity to drive positive environmental change on a massive scale, NGOs such as Environmental Defense worked with Wal-Mart to engage other networks.

Across all 14 networks, the leaders intensified the company's efforts to move toward stronger relationships with a relatively small number of suppliers. With assistance from the environmental NGOs and consultants, Wal-Mart set a goal of motivating suppliers to improve the environmental sustainability of products and processes.

Key Findings:

Awareness:

Wal-Mart is able to provide suppliers with valuable knowledge and process assistance through its strong relationships with the environmental nonprofits in its networks. Assistance from Wal-Mart's network partners is invaluable to suppliers and makes doing business with Wal-Mart more
attractive. Suppliers have a strong incentive to innovate in order to keep Wal-Mart's business.

- When the Chinese government threatened to shut down a number of textile dye houses, including one of Wal-Mart's suppliers, in order to reduce pollution in Beijing ahead of the 2008 Olympics, Wal-Mart immediately took action, putting the dye house in touch with one of the NGOs in the Wal-Mart network, which helped it formulate a more environmentally friendly process that reduced its toxic output very quickly (Plambeck 2007).
- Wal-Mart is relying on the WWF to increase the number of fisheries and processing plants in the MSC certification program. WWF helps boat operators and processors with a preliminary evaluation and identifies specific problems that need to be fixed.
- The goals have already had impacts outside of the supply chain and into the average household. Wal-Mart passed its goal of selling 100 million compact fluorescent light bulbs in 2007 ahead of schedule (Grover 2007). To date, Wal-Mart and Sam’s Club have sold 145 million CFLs, saving customers more than $4 billion in electricity costs over the life of the bulbs. Those bulbs have the effect of Eliminating the need for three coal-fired power plants, Powering a city of 2 million people, Powering 898,726 homes, Keeping 43,446 rail cars of coal from being burned, Pulling 1.8 million cars off the road, and Curbing 18.8 billion pounds of CO2 emissions (Wal-Mart 2008).

Adherence:

Wal-Mart is able to leverage its buying power and diverse partnerships to drive adherence to sustainability across its networks. By making a commitment to buy a specified quantity of each product certified as environmentally friendly, Wal-Mart gives its suppliers an incentive to develop and produce that product in a more sustainable fashion.

- In order to prevent a depletion of soil nutrients and to meet organic standards, a farm needs to remain free of non-organic pesticides or similar materials for a period of three years prior to the harvest of any organic crop. To prevent potential economic hardship to farmers and to encourage adherence to a more
sustainable growing model, Wal-Mart made a five-year verbal commitment to buy organic cotton from farmers to give them confidence and stability. In addition, to help reduce uncertainty in the market, Wal-Mart also agreed to purchase the organic cotton farmers' alternate crops (Plambeck 2007).

- In 2006, Wal-Mart announced a highly ambitious seafood goal to carry 100 percent MSC-certified wild-caught fish in its stores within three to five years. As the supply of MSC-certified fish is currently far from adequate to meet Wal-Mart's demand, this public announcement is effectively a commitment to buy from all fisheries that become MSC-certified.
- To acquire personal computers that were compliant with the EU Restrictions on Hazardous Substances (RoHS) Directive as part of its efforts to carry more environmentally friendly electronics, Wal-Mart made a commitment to Toshiba to buy 12 weeks' worth of inventory as opposed to its more typical four-week commitment.

Collaboration:

The motivation for these moves is not a question of philanthropy – Wal-Mart sees clear business opportunities and intends to seize them. In the end this is perhaps the most encouraging sign of all – putting any moral imperative aside, businesses are seeing that green just makes sense (Grover 2007). “Everything we’ve been doing is good for business, not at all linked to marketing (Kistler 2008).” To accomplish its goals, Wal-Mart has enlisted many unusual relationships across sectors:

- Working with Blu Skye and the Rocky Mountain Institute, Wal-Mart created its sustainability vision. Expanding from incremental gains, like improving the efficiency of Wal-Mart's trucking fleet by a few percent over several years, they now plan to double efficiency in 10 years.
- A scorecard was developed with input from its packaging network, including nonprofits, the U.S. Environmental Protection Agency, Wal-Mart's direct suppliers, packaging suppliers, and other stakeholders, in order to use less packaging, utilize more effective materials in packaging, and source these materials more efficiently relative to other suppliers. In the first month 2,268 vendors have logged onto the packaging scorecard site and 117 products have been entered into the system.
Depleting species of wild seafood present the greatest challenge for Wal-Mart's seafood network. Wal-Mart is working with the Marine Stewardship Council's (MSC) certification program for wild-caught fish to address this challenge. MSC has defined standards for certification as a sustainable fishery, based on the United Nations' Code of Conduct for Responsible Fishing and on input from fishermen, retailers, government, nonprofits, and other stakeholders. The MSC certifies third parties to audit and certify fishery and processor compliance throughout the supply chain, from "boat to plate." An MSC eco-label on the finished product signals to consumers that the fish has been harvested and processed in a sustainable manner. By raising consumer awareness, the MSC hopes to drive demand and thus motivate the industry to shift to more sustainable fishing practices (Plambeck 2007).

Wal-Mart is now the largest purchaser of organic cotton and has partnered with the Organic Trade Association and the Organic Exchange to select standards for organic cotton farming and manufacturing. Regardless of where the cotton is grown around the world, the farmers have to follow US Department of Agriculture guidelines for organic growth, which is certified by third-party organizations.

In 2007, Wal-Mart partnered with the Clinton Climate Initiative to explore ways to use its purchasing power to lower prices on technologies such as energy efficient building materials and lighting for cities addressing climate change. By switching to LEDs, Wal-Mart estimates that cities could save 50 percent on street lamp energy consumption and reduce maintenance costs by 80 percent. Additional technologies the partnership will explore include interior LED lighting, variable-speed heating ventilation and air conditioning technology (HVAC) and solar power purchases (Reuters 2007).

In October 2007, Wal-Mart hosted its Live Better Sustainability Summit. Exhibitors included WWF, FSC, BP Solar, TransFair, Organic Exchange, McDonough Braungart Design Chemistry, the Biomimicry Guild, Act Now and many others. During the summit, CEO Lee Scott stated that Wal-Mart is “in this for the long haul, and expects its suppliers to be in it for the long haul, too.” Scott pointed out that while his company is aiming for zero waste and 100% renewable energy, this still only accounts...
for 8% of its footprint, and that Wal-Mart must green its supply chain if it has any chance of becoming sustainable (Grover 2007).

Walmart’s Future as a Sustainability Network:

As a multinational corporation with huge implication to its decision-making, the drive towards more environmentally friendly options is encouraging and has far-reaching implications. Wal-Mart’s planned expansion into Chinese, Indian, Indonesian markets (Kistler 2008) presents a greater challenge and opportunity to expand this network successfully to drive sustainable change around the globe.

Wal-Mart is also one the largest employers in the US, and the current business model doesn’t provide adequate care for its employees (living wage, healthcare), or the towns in which it operates (undermining local business). These are major concerns, and when ensuring sustainability is achieved on a global scale, a company that is this large should take into account all issues of sustainability to be considered a truly sustainable network as defined by us. The role of driving sustainable change across its supply chain will certainly go a great deal to alleviating many environmental challenges the current system creates. From the perspective of social sustainability, there are still many skeptics. "Even if Wal-Mart achieved 100 percent of its environmental agenda, it would be hard to see how a company facing serious allegations of unequal pay, low pay, intimidation of union organizing efforts, and no limits on store siting, sprawl and growth could get an SRI (Sustainable and Responsible Investment) gold star. It's interesting that none of the proposals announced so far would restrain their growth in any way--in fact, they seem to be suggesting that their huge size and buying power will somehow bring environmental and social justice," said Conrad MacKerron, director of the corporate responsibility program at the As You Sow Foundation (Baue 2005).
Appendix F: An Emerging New Sector: Global Action Networks as a Model of Success

Historical Background of GANs

In response to recent trends in globalization, a new type of organization has emerged over the past few decades, known worldwide as a Global Action Network (GAN). This type of organization has been modeled and documented by the organization GAN-Net, a loosely affiliated membership association of organizations working within the structure of the GAN model. GAN-Net was founded on the urgent need for increased collaboration, both between multinationals and across global governance systems worldwide, as declared by United Nations Secretary General Kofi Anan. This declaration, documented in Critical Choices: The United Nations, Networks, and the Future of Global Governance, spurred the institutionalization of the GAN network model, which is now embodied by twenty-nine distinct organizations worldwide.

Why the need for GANs?

"The stakes are high. Globalization is not, after all, the end of history. It is time to take a proactive stance lest we witness a full-fledged backlash against globalization. The status quo is unsustainable, and a chance for the worse by forcing globalization back into national boundaries- ’moving into the past’- is not an unlikely scenario. Networks can help to change this unsustainable status quo for the better, by responding to the challenges and taking full advantage of technological change and economic and social integration." (Reinicke 2000) As addressed earlier in this paper, the need for organizational networks that support a global governance conducive to moving towards a sustainable society is imperative. There is less time available than ever to plan, organize, and mobilize for change, and the GAN model provides an organizational structure with a high operational efficiency and potential as a systemic change agent.

The latest Human Development Report reinforces the potential of existing GANs. Mark Brown, administrator of the UNDP, states that ”We are seeing the emergence of a new, much less formal structure of global governance, where governments and partners in civil society, the private sectors and others are forming functional coalitions across geographic borders and
traditional political lines to move public policy in ways that meet the aspirations of a global citizenry…their key strength is that they are bigger than any of us and give new expression to the UN Charter’s ’We, the peoples’” (Reinicke, 2000).

Current societal tensions with regards to changing environmental conditions and increasing resource demand have spurned a widespread scramble for solutions, and piecemeal answers have been compiled, but often in isolation and with little systems perspective of its impact on the planet and society as a whole. The GANs model provides a unique, flexible, adaptable and evolving vehicle for social change. The following provides greater insight into specific characteristics of an organization working within a GAN model.

Description of a GAN

GANs structure and functions span important societal divides, such as between developed–developing countries, across the private, government, and civil society sectors, bridging varying cultures and knowledge disciplines. GANs also share five key characteristics. These include being global in nature and embodying a focus on issues of common public concern. GANs are emerging, evolving entities that are continually building system consciousness, or greater awareness of the global context of their work.

GANs aim to identify critical initiatives that can enhance the system coherence of the field of sustainable development (a critical complex system concept)—enhancing the ability for all those working on a specific issue to move in a similar direction with increased speed, impact and effectiveness. (Waddell 2004) Other characteristics include a self-regulatory factor, in which GANs can adapt and re-focus its network structure, function, and regulatory tools and mechanisms to address global social need, maintain relevance for its wide range of stakeholders, more effectively disseminate information and catalyze systemic change.

Diversity and the creative tension between global and local levels of systemic change is a crucial aspect of the GAN networks. One key strength of the GANs model is the capacity to converge diverse stakeholder objectives, needs and agendas into a comprehensive, manageable context.

Another characteristic of a GAN is its capacity as a bridge enabler. For example, the Forest Stewardship Council creates and supports
bridges mainly between business and civil society, and within civil society between North and South. The Global Compact, on the other hand, represents a crucial link between the United Nations and the private sector. The Compact organized around the principle that the challenge of the global of sustainable development had to be addressed at the micro level, by involving individual companies. These two types of GANs have created bridges across gaps where none previously existed.

Critical bridges created by GANs include:

- Geopolitical, between North/developed countries and South/developing countries
- Experiential, between analytical research expertise and practical applied experience
- Professional or disciplinary, between natural and social sciences, or between economics and politics
- Ideological, between trade and sustainable development, or between environment and development
- Scale, between global, national and local
- Form and size, between local and global, large and small NGOs, between multinational corporations and small–medium enterprises, international government bodies and local ones (Waddell 2004)

The final characteristic of GANs are their capacity to act as global societal change agents. Bringing about global change with complex issues of public interest requires unusual and new skills, processes and strategies. GANs are developing these, and their success will be tied in large part to their ability to build new capacities to do the deep and broad change work required. GANs operate at the global level, but to be effective they must address what GAN-NET coins as the ‘glocal’ challenge of generating valued activity at the local business/community/municipal level as well. This involves understanding and managing the complexities of both creating a global network and building on existing local activity relevant to the global network goals.

Applying the GAN Model to Emerging Sustainability Networks (ESNs)

GAN-Net and its cooperating GAN organizations have produced and documented a vast knowledge base of information regarding the application of the GAN model within the current societal context and existing sustainability challenges. Existing Sustainability Networks (ESNs)
could increase their value tremendously through an explicit application of the defining characteristics of a GAN to the specific challenges addressed by that network. It is also crucial to remember that existing GANs themselves are Emerging Sustainability Networks, and are in a constant evolution of maturation.

The effects of this successful application of the GAN model has the potential for creating a ripple effect of success both across internal operations of the network as well as external relations across the field. The intangible outcomes of networks—such as greater trust between participants and the creation of a forum for raising and discussing other new issues—are often as important as the tangible ones, and they may endure even longer. Transparency International, for example, has not only scored significant successes in the fight against official corruption as a GAN devoted to corporate accountability, but also built coalitions of trust between very diverse actors in this sensitive issue area (Reinicke 2000). Although this GAN works more closely in the field of CSR rather than sustainable development, much can be learned from the capacity of this GAN to engage such a wide variety of stakeholders.

GAN Best Practices

The GAN model is ideally embodied through the following best practices and organizational characteristics:

- **Multi-stakeholder approach**: Participatory model in which government and business are only two of several actors
- **Theoretical organizational base** where ethical, operational, communications, and participatory gaps are thoroughly addressed:
  - **Participatory gap**: This addresses the need for systemic group processes. Is the stakeholder group engaged, well defined, and represent a diversity of perspectives?
  - **Ethical gap**: This addresses the need for checks and balances in the global governance system, as well as equitable opportunity for social, political, economic, and environmental health issues to be addresses. Does the GAN take responsibility for being a part of the problem it aims to solve? Does it embody respect for cultural diversity and human rights?
  - **Operational gap**: This addresses the need for strategic action planning and design that ensures efficient resource
allocation, adherence to timelines, a thorough cost assessment of social, economic, and environmental impacts of its activities, as well as the capacity to create a desired impact in the field.

- **Communications gap**: This addresses the need for two-way communication channels both internally and externally, as well as a transparent process for information dissemination that is accessible to all stakeholders. This process needs to occur in a timely, effective manner with enforcement and information quality control mechanisms in place to reinforce and support.

- **Implementation of clustering mechanisms**, including global-to-local bridges, to ensure all sectors, societal levels of engagement and stakeholders are clearly and equally represented

- **Systems thinking logic** that emphasizes reinforcing and balancing loops. Global systemic change does not happen overnight, and requires a systems-based perspective when addressing sustainability challenges and perspective on organizational development and potential.

- **Knowledge integration and continual organizational development** and evolution as core principles

- **Organizational vision and function within the context of larger complex societal system**: GAN as a systemic change agent gradually guiding key stakeholders towards a shared vision.

- **High-level system leverage and positioning**: Proactive network management allows GANs to maximize leverage and societal context to push issue of concern higher on the global agenda

- **Voluntary engagement**: Skillfully inspire change across disciplines by developing collective will without hierarchical structures or mandated enforcement

- **Transparency, accountability and effectiveness** must be core characteristics of a successful GAN. Trust and legitimacy are critical factors for building repore across a broad spectrum of stakeholders

- **Organize for third-order and tri-sectoral change**: GANs have a great capacity for creativity and innovation, and their capacity for co-production and collaboration across disciplines (academic, professional, and non-governmental) proves to be a key attractive feature. However, social change incurred by a GAN needs not only to be wide, spanning sectors, but deep, initiating long-term systemic change. Third order change represents the most deep systemic
change possible, in which power alignments and fundamental social structures are altered. All GAN action should be undertaken bearing this ultimate objective in mind. (Waddell 2007)

Best Practices in Action: Critical Success Factors of ESNs currently implementing the GAN network model

Engagement: The GAN network model has proven highly successful with regards to engagement. Transparency International, for example, is a GAN working in the field of anti-corruption. Although single issue in nature, TI functions as a network of over 90 country chapters worldwide, each addressing national corruption issues specific to the cultural and social context of the country. Its consultation process when developing or reviewing tools and policy changes holds engagement as a key success factor, involving a broad range of stakeholders from the government, nonprofit, and business sectors, as well as national media networks.

Network Structure: The GAN network model is a highly effective decentralized network structure. GANs such as the Global Water Partnership may be single issue but involve an impressive range of stakeholders, with regional initiatives linked into the global organizing principles as a ‘network-of-networks’. GWP is organized as a network of regional partnerships, each addressing specific issues of water management across 12 distinct geographic regions. These regional partnerships bridge a variety of local sectors and interest groups to identify and discuss common barriers to success and to develop action plans. A steering committee and technical committee provide strategy and operational support, but the real action happens at the decentralized, regional level for the Global Water Partnership and other GAN networks.

Decentralization: The Global Compact optimizes its efficiency with a highly decentralized network structure. Non-bureaucratic with a strong emphasis on fostering maximum involvement and a sense of ownership by all stakeholders, the Compact is structured as loose network of local networks, tied together with an advisory board, a small team of staff, and an inter-agency internal body to ensure effective principle integration by all local networks. All participating stakeholders retain independence while tied together with voluntary accountability measures, such as annual progress reports submitted to the entire Compact community. The advisory board is a highly personal, honorary assembly, utilizing internal reputation
to increase cohesiveness.

**Whole-Systems Perspective:** The Global Compact, one of almost 30 Global Action Networks worldwide, functions with an exemplary level of self-awareness. Embodying a 10-principle mandate that addresses key public concerns, as well as positioning itself to involve all relevant stakeholders, the Compact has implemented a vision of business transformation unparalleled in the nonprofit community.

**Heightened Self-Awareness:** The Global Action Network model reinforces this need for self-awareness within the global context. The Forest Stewardship Council, for example, is a stakeholder-owned network that has utilized its reputable trademark to promote sustainable forestry management across sectors worldwide. FSC has produced the only existing global certification standard, functioning with the understanding and vision that responsible forestry must be addressed on an international, not regional or local level.

**Effective Multi-Stakeholder Collaboration:** The Global Reporting Initiative, one of the most visible GANs, has achieved remarkable collaboration to create and expand its network and reputation. As a leader in voluntary reporting standards, the GRI has fine-tuned a multi-stakeholder process for developing reporting guidelines that requires broad cross-sector collaboration combined with technical expert review of implementation tools. The success of GRI as a reporting tool is directly related to the network’s success in collaborating across sectors.

**Further Information and Research:**

Researchers managing this study greatly support the work of GAN-Net and encourage further exploration of their writings and publications by all interested parties.