Social Networking and Governance for Sustainable Development

Terri Willard

March 2009

Social Networking and Governance for Sustainable Development

Terri Willard

March 2009

Table of Contents

Abstract

Communications technology has enabled new approaches to governance in which stakeholders across sectors and jurisdictions are engaged in consensus building and implementation processes. This paper explores some mechanisms through which online social networking may impact on governance for sustainable development. Are social networking sites driving the transformation of the governance landscape or are they merely diverting vast amounts of time from addressing the difficult sustainable development challenges at hand? And if they are useful tools for sustainable development, how can we ensure that they live up to their potential?

1.0   Introduction

Social networking sites (SNS) have been growing in popularity over the past five years. However, the 2008 U.S. Presidential election shone a spotlight on their potential for making a real-world impact. Some credit Barack Obama's success to his commitment to utilizing online social networking tools for connecting with the electorate. Early in the campaign, Obama hired one of Facebook's founders to develop his own campaign SNS as well as a strategy for utilizing other SNS platforms to spread their message and to mobilize supporters to take action. His staff sought to ensure that the Obama social network would mirror the off-line world, because supporters would foster more meaningful connections by attending neighbourhood meetings and calling on people who were part of their daily lives (Stelter, 2008). The Obama campaign's social network also "married community organizing to the Internet" by applying two-way (perhaps more accurately multi-way) communication processes on a major scale (Feek, 2008). Following the election, people began to discuss more seriously whether social networking sites might be powerful tools for re-shaping governance.

Governance is the process whereby societies and institutions make their important decisions, determine who they involve in making those decisions and how they render account. The governance process typically rests on a governance system or framework—that is, the agreements, procedures, conventions and policies that establish who has power, how decisions are taken and communicated, and how accountability is rendered (Graham, Amos, & Plumptre, 2003).

Even though we have witnessed growing social awareness and support for sustainable development since the 1970s, decisions continue to be made that are detrimental to the sustainability of humanity and the environment. Individuals, communities, businesses, governments—even those with the best

of intentions—are all falling short of making decisions as if people and the future mattered. At some point, we must acknowledge that the systems producing such decisions are fundamentally flawed in many ways. Our governance systems at all levels need to be reconsidered and restructured.

Since the origins of the concept of sustainable development, the need for a different approach to governance has been clear. The Brundtland Commission noted in 1987 that the rapid rate of change is "frustrating the attempts of political and economic institutions, which evolved in a different, more fragmented world, to adapt and cope." While wide-ranging in its implications, the Commission's report was surprisingly modest in its expectations—building capacities piecemeal upon an existing infrastructure of national ministries, United Nations agencies and regional organizations.

Over the past 20 years, the technological and human forces behind globalization have drawn people and their environments into an even more densely interwoven tapestry of problems and possibilities. Feedback loops between political, economic, social and environmental systems have become ever tighter and more complex. Communications technology has enabled new approaches to governance in which stakeholders across sectors and jurisdictions are engaged in consensus building and implementation processes. The emergence of the "social web"—the global web of users creating content for and conversations with each other—has raised questions about whether these new tools and networks could be used more proactively to improve decision-making and action about the world in which we live.

Three information and communications technologies underlie the explosion of the "social web":

- Mobile Communications – extending Internet access through a new generation of mobile phones and handheld computers;
- Social Media – enabling individuals to easily upload their own content (text, photos, video) and to find (and discuss) the content generated by others; and
- Online Social Networking – enabling people to maintain and to extend their personal and professional networks, as well as to facilitate the flow of information through these networks.

These three technologies are extending the possibilities originally envisioned for Web communications and are linking people, ideas and institutions together in new ways. They have enabled society to begin to experiment with turning its cognitive surplus into something good—for themselves and for their communities (Shirky, 2008). Increasingly, average individuals are gaining access to platforms enabling them to challenge the status quo (Godin, 2009) and to imagine what non-hierarchical participative government might act like (Us Now).

Mobile communications and social media have gained a great deal of attention and research for their ability to raise awareness of issues, improve monitoring of environmental and social realities, and as

tools for political action. For pioneers of mobile telephony and texts as tools of protest and dissent, simply summoning people to demonstrations—a technique first deployed in the Philippines as long ago as 2001—is old news. Built upon experiences around the world, the Tactical Technology Collective has now built "Mobiles in-a-box: Tools and Tactics for Mobile Advocacy" (http://mobiles.tacticaltech.org/) addressing a broad array of scenarios which many advocates find themselves dealing with: outreach and participation; fundraising and resource mobilization; people's media; and coordinating and mobilizing.

Social media for sustainable development has also become the subject of standard training courses for non-profits in North America and Europe. Training programs are now being adapted and applied to developing country contexts. The Web2forDev conference (http://www.web2fordev.net/) held in late 2007 was an important first step in acknowledging that Web 2.0 tools are being used by activists, non-profits and researchers, even in countries with limited Internet access. The results have been impressive. The *Economist* notes, for example, that "Blogs play a crucial role in attracting people to marches and sharing information. In Iran, bloggers mounted a campaign to publicise the threat to wetlands from roads and dams. Bulgaria's bloggers campaigned on behalf of the Strandzha Park, the country's largest protected area, targeted by commercial developers; they used a panoply of photo, video, and petition sites. Bloggers in Poland placed special 'green ribbons' on their sites to show their solidarity with a campaign to save the... Rospuda valley from new roads" (Revolutions coloured green, 2008).

However, online social networking sites have not been as closely examined for their impact. Stereotypes continue to abound that social networks are primarily for students interested in expanding their social lives. Alternately, others expound a vision (as yet untested) of loosely knit groups of individuals bound together through social networks which have gained the power to challenge even global superpowers. Which vision is correct? Are social networking sites driving the transformation of the governance landscape or are they merely diverting vast amounts of time from addressing the difficult sustainable development challenges at hand? And if they are useful tools for sustainable development, how can we ensure that they live up to their potential?

To address these issues, this paper focuses on three preliminary questions:

- What are social networks and how are they being used by people interested in sustainable development?
- Are online social networks changing the processes whereby societies and institutions make their important decisions about sustainable development, determine who they involve in making those decisions and how they render account?
- What more can we do to strengthen the ability of online social networks to improve governance processes for sustainable development?

2.0 Social Networks 101

A social network is a social structure made of nodes (which are generally individuals or organizations) that are tied by one or more specific types of interdependency, such as values, visions, ideas, financial exchange, friendship, kinship, dislike, conflict or trade. These concepts are often displayed in a social network diagram, where nodes are the points and ties are the lines. The resulting graph-based structures are often complex, but can be used to analyze the social capital and influence of individual actors.
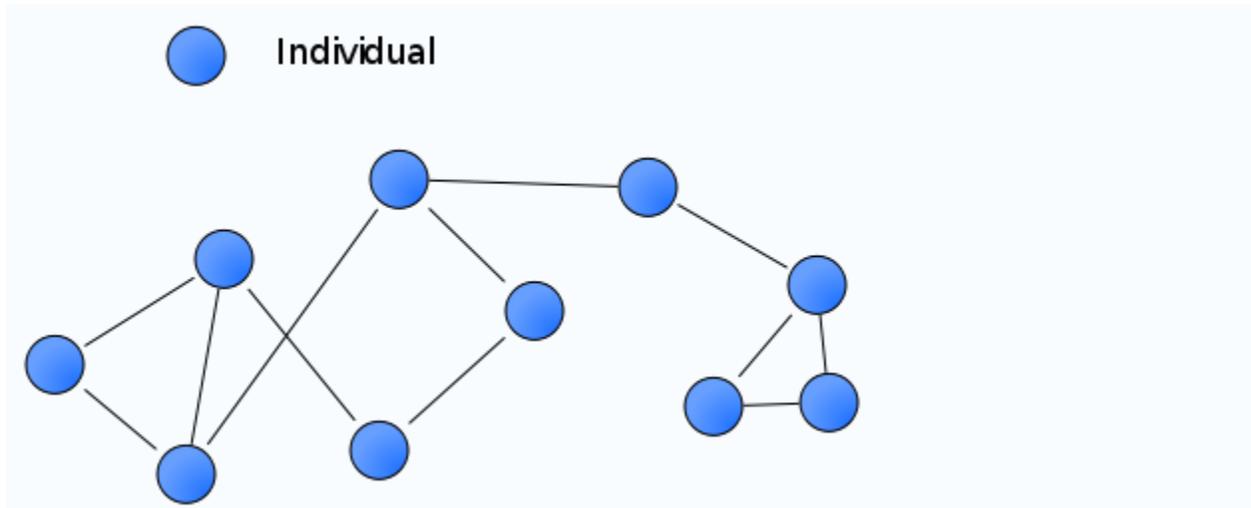
Figure 1: Social Network Diagram (Source: http://en.wikipedia.org/wiki/Image:Social-network.svg)

Research in a number of academic fields has shown that social networks operate on many levels, from families up to the level of nations, and play a critical role in determining the way problems are solved, organizations are run, and the degree to which individuals succeed in achieving their goals (Wikipedia, Social Network). New research is concluding that social networks are also powerful mechanisms for rapidly shifting and transforming social norms throughout the network, through a process of "social contagion" (Christakis, 2008).

Interest in social networks has grown exponentially with the development and spread of online social network sites. **Social network sites (SNSs) are "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system"** (Boyd & Ellison, 2007)**.** SNSs are commonly viewed as part of the overall Web 2.0 revolution that aimed to enhance creativity, communications, secure information sharing, collaboration and functionality of the Web (Wikipedia, Web 2.0).

However, like most Web 2.0 services, some features of SNSs have been around since the early days of the World Wide Web. The earliest SNS was SixDegrees.com, launched in 1997. Playing upon the idea of six degrees of separation,[1] users could send messages and post bulletin board items to people in their first, second and third degrees, and see their connection to any other user on the site. By the time it closed three-and-a-half years later (due primarily to a lack of a viable business model), other SNSs had begun to emerge. Social networking began to flourish as a component of business Internet strategy around March 2005 when Yahoo launched Yahoo! 360°.

The rise of SNSs indicated a shift in the organization of online communities. While Web sites dedicated to communities of interest still exist and prosper, SNSs are primarily organized around people, not interests. Early public online communities, such as Usenet and public discussion forums, were structured by topics or according to topical hierarchies, but social network sites are structured as personal (or "egocentric") networks, with the individual at the centre of his or her own community (Boyd & Ellison, 2007).

Launch Dates of Major Social Network Sites

Year	Sites
'97	Six Degrees.com
'98	
'99	AsianAvenue; LiveJournal; BlackPlanet
'00	LunarStorm (SNS relaunch); (SixDegrees closes); MiGente
'01	Ryze; Cyworld
'02	Fotolog; Skyblog; Friendster
'03	LinkedIn; Tribe.net, Open BC/Xing; Couchsurfing; MySpace; Last.FM
'04	Orkut, Dogster; Multiply, aSmallWorld; Catster; Hi5; Flickr, Piczo, Mixi, Facebook (Harvard-only); Dodgeball, Care2 (SNS relaunch); Hyves
'05	Yahoo! 360; Cyworld (China); Ning; YouTube, Xanga (SNS relaunch); Bebo (SNS relaunch); Facebook (high school networks); AsianAvenue, BlackPlanet (relaunch)
'06	QQ (relaunch); Windows Live Spaces; Twitter; Facebook (corporate networks); Cyworld (U.S.); MyChurch, Facebook (everyone)

Figure 2: History of Social Networking Sites (Source: Boyd and Ellison)

While not available on all SNSs, some common tools which members may create and link to have included:

- Member profiles – to identify personal interests and perspectives. Updates to these profiles are usually automatically flagged for friends on their SNS home pages. Individuals often express political opinions, concerns and new activities in these profiles;

---

[1] Six degrees of separation refers to the idea that, if a person is one step away from each person they know and two steps away from each person who is known by one of the people they know, then everyone is at most six steps away from any other person on Earth.
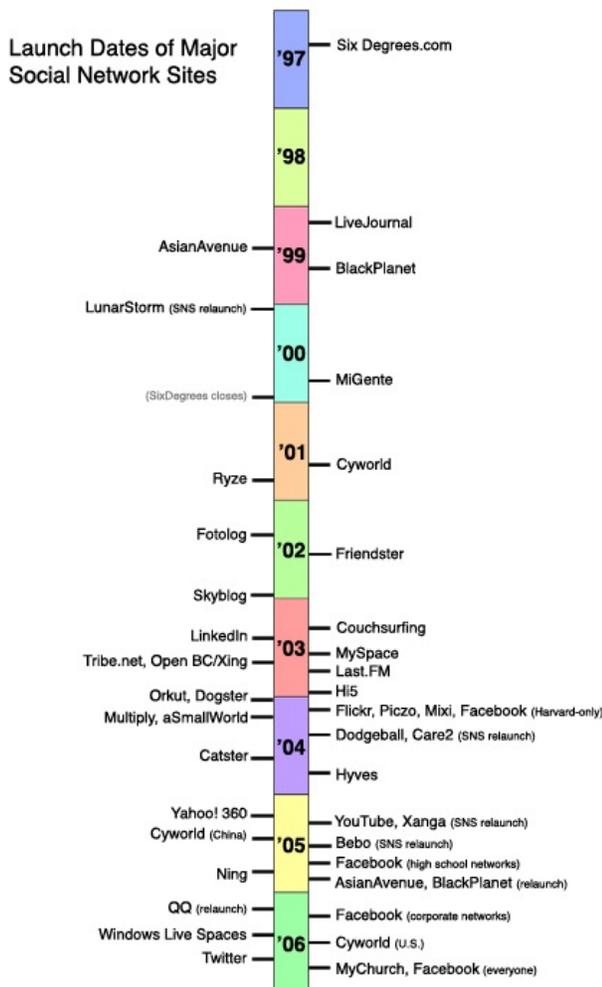
- Content – to express one's opinions through uploading text, videos, photos and links to other sites. The amount of content on SNS is staggering. Facebook alone has over 10 billion photos uploaded on its servers;

- Groups – to voluntarily affiliate with others around a shared interest. Most group tools frequently include links to member profiles; discussion boards; notice posting areas; and the ability to exchange links, videos and photos. A wide variety of groups have been created by existing open and closed sustainable development networks, as well as for organizations (e.g., Sustainable Development Association; Foundation for Sustainable Development). Group administrators usually have full control over the degree of openness and postings to a group;

- Events – to market and organize virtual or face-to-face meetings and workshops; and

- Pages – to express support for organizations, businesses, products, places, media outlets and ideas. While organizational and business pages must be developed by an authorized representative, concerned individuals are increasingly creating pages to express support for such diverse ideas as tap water and trees.

While their key technological features are fairly consistent, the cultures that have emerged around SNSs are varied. Most sites support the maintenance of pre-existing social networks, but others help strangers connect based on shared interests, political views or activities. Some sites cater to diverse audiences, while others attract people based on common language or shared racial, sexual, religious or nationality-based identities. Sites also vary in the extent to which they incorporate new information and communication tools, such as mobile connectivity, blogging and photo/video-sharing (Boyd & Ellison, 2007).

They also vary widely in terms of their popularity around the world. At least 25 social network sites exist which command the majority of SNS traffic in at least one country (see Appendix 1 for map). Linguistic factors, as well as previous personal connections within and between countries, continue to drive the popularity of specific SNSs. Since their introduction, social network sites such as MySpace, Facebook, Cyworld and Bebo have attracted hundreds of millions of users, many of whom use the sites daily. In addition, there are an even larger number of niche social networks that focus on a specific issue or community or interest. However, most of these niche networks remain small, lacking the network size and monetization capability to really break out of the pack (Beisel, 2006).

Social networks operate under an autonomous business model, in which a social network's members serve dual roles as both the suppliers and the consumers of content. This is in contrast to a traditional business model, where the suppliers and consumers are distinct agents. Theoretically, this should reduce business costs since user-developed content is free. Nevertheless, revenue is still

required to finance marketing, server space and database programming. This revenue tends to come from one or more of the following sources:

- Advertising revenue – Sales of advertising has driven the rise of the large mainstream SNSs. Some believe that the quantities of information that SNSs have on each user will enable highly-targeted advertising of great benefit to businesses both large and small. However, the 2008–09 global economic downturn and historically low click-through rates to ads from SNSs, raise questions about the viability of this model;
- Subscription-based revenue – While it is possible to charge access fees if content levels are sufficiently high, this model has fallen largely out of favour. It is still a viable model, however, for professional associations that include access to a SNS as part of membership services;
- Premium services revenue – While most SNSs and SNS platforms provide access for free, some enable users to subscribe to premium services. For example, LinkedIn provides services ranging from US$250 to $5,000 per year to users who desire expanded tools for searching and connecting with new contacts. Ning (a free SNS authoring platform and host) allows SNS creators to pay to remove Ning advertising, to run their own advertising and to have their own domain name;
- Grant revenue – Some socially and environmentally oriented SNSs have received grants from foundations and government agencies to support their initial set-up and operations; and
- Social entrepreneurship revenue – Some SNSs are supported by the profits earned by the enterprise from selling their technical and project management services to other agencies.

The varying business models have led to a wide variety of SNS designs, influencing the degree to which they have been adopted by various sustainable development stakeholders.

3.0   Sustainable Development and Social Networking Sites

Sustainable development advocates have tracked and attempted to utilize online social networking tools since their earliest emergence. Shortly after the development of group tools on Sixdegrees.com in January 1999, the International Institute for Sustainable Development created Six Degrees of Sustainability in order to network individuals with an interest in the field. Group tools included:

- Directory – including group member profiles and how you are connected to each other;
- All My Degrees – a filter of the directory of group members who are also in up to your first six degrees by their occupation, skills and geographical location;
- Bulletin Board; and
- Chat.

It was hoped that service would enable young professionals in sustainable development to meet one another and to establish international networks of trusted contacts. As one of nearly 15,000 member-initiated groups, Six Degrees of Sustainability reached a peak of just over 100 members. Unfortunately, with the purchase of SixDegrees.com by YouthStream Media Networks in early 2000, the site was reoriented towards American university students. It eliminated the Sustainability group without any warning in August 2000 during a relaunch of group tools. Sixdegrees.com itself folded in December 2000 due to a lack of a viable business model.

Since that time, however, other organizations and individuals have pursued sustainable development within mainstream SNSs, within niche sustainable development SNSs and through the SNS tools available on other social media platforms. The following sections provide a brief overview of these approaches to sustainable development social networking to date.

3.1   SD social networking within mainstream SNSs

Mainstream social networking sites place the individual user at the centre of his/her own universe. These "horizontal" networks enable individuals to maintain and to develop connections with friends and colleagues. With their large subscriber bases, mainstream social networking sites such as Facebook, Orkut and LinkedIn invariably attract some members with sustainable development interests. By linking together individual members, groups, events and pages, SNSs enable individuals to learn about new ideas and social movements as their friends and colleagues become involved in them. SNSs empower viral marketing of ideas, events and organizations by enabling the rapid sharing of information received from one contact to all others. It is within these large networks that "social contagion" is possible, leading to changes in behaviours and actions (Christakis, 2008).

Social Networking and Governance for Sustainable Development

While most mainstream SNSs are primarily "personal" in terms of the type of information users share with each other (e.g., family events, hobbies, music, current events), "professional" SNSs have also been developed to facilitate improved sharing of business-related connections and knowledge. Sustainable development advocates, professionals and activists are active on both types of mainstream SNS.

3.1.1   Personal social networking sites

The majority of mainstream social networking sites are targeted towards the sharing of personal information and interests. However, "when you're working in the manic do-gooder sector in particular, your circle of friends overlaps hugely with your circle of work contacts. Facebook is perfect for keeping that line fuzzy" (Stroehlein, 2009). Mainstream social networking tools keep a critical mass of activists and interested parties together better than e-mail listservs ever did. The personal nature of these sites increases commitment and the reader's willingness to engage with others. Beyond the standard SNS toolkit enabling improved relationship management, sustainable development activists have begun experimenting with SNS groups tools and the development of third-party applications that extend the tools available to users.

Sustainable development-oriented groups on mainstream SNSs tend can be rather large, since they require little ongoing maintenance or attention (e.g., 19,000+ members of the Facebook "Go Green" group and 21,000 members of the Orkut "Save the Environment" community). Individuals largely join these groups as a statement of interest in the issue, rather than as a mechanism for ongoing discussion and action. Interestingly, MySpace groups dedicated to sustainable development topics tend to be considerably smaller (e.g., the largest, on Alternative Energy, has only 2,100+ members). The MySpace forums (bulletin boards) have also proven to be a less-than-useful tool for sustainability advocates, since there is no single forum for sustainable development. Discussions about the environment, poverty and global issues are generated by users in the politics, religion and science areas of the forum. Given the large youth population on these platforms, these groups tend to focus on a broad spectrum of actions which individuals could take in their daily lives.

Since Facebook enabled third-party development of applications that integrate with its main databases of member information, individuals and organizations have begun to experiment with the creation of additional tools for sustainable development, most successfully for fundraising for on-the-ground environmental actions. The most

Figure 3: (Lil) Green Patch Graphics

Social Networking and Governance for Sustainable Development

popular and visible SD themed applications have been (Lil) Green Patch and (Lil) Blue Cove with 7.9 million monthly active users.[2] Through these applications, users send free virtual gifts to populate friends' gardens and coves. For every 10 gifts the user sends (i.e., images of flowers, birds, and characters), corporate sponsors donate funds to protect the rainforest. Over 96 million square feet have been saved so far through the Nature Conservancy. This approach is now being adopted by other Facebook application developers: Sea Garden raises funds through the virtual gift giving of over 1M users for the Surfrider Foundation; H$_2$Opia raises funds for WaterAid from over 48K monthly users; Earthkeepers sponsored the planting of 500,000 trees in the real world in less than six months based on the virtual gifting of 30K monthly Facebook users.

Other approaches to sustainable development applications have drawn fewer users, but strive to change users' knowledge, attitudes and behaviours in a clearer manner. "The Stop Global Warming Game" has approximately 63,500 monthly active users, who are engaged in a slow-paced simulation game of initiating low-carbon projects around the world. The game serves primarily an educational purpose, although game developers donate money raised from ads and gold memberships to various causes. "I Am Green" has only 9,600 monthly active users—although there are 139,500 members showing they are Green on their profiles. Users indicate ways in which to become more "green" and encourage each other to take additional actions in their daily lives. The Zerofootprint Calculator has just over 600 monthly active users but is criticized for only linking to the one-minute version of the calculator, rather than the more thorough one.

3.1.2 *Professional social networking sites*

While some professional associations and communities of practice have established a presence on Facebook through groups or pages, the functionality of these spaces is limited for real information sharing and networking. To meet professional business networking needs, separate SNSs have been developed to serve as business and professional networking venues. By creating these separate SNSs, people are able to share targeted job-related information without concern over blurring the boundaries between their business and personal lives. Interestingly, the demographics of professional networking sites appear to be slightly older than the average for personal SNSs (RapLeaf, 2007), perhaps one factor explaining a stronger interest in personal privacy.

The largest business-oriented SNS is LinkedIn (http://www.linkedin.com/), an interconnected network of experienced professionals from around the world, representing 170 industries and 200 countries. LinkedIn has over 34 million members and a new member joins LinkedIn every second of every day. Approximately half of their members are outside the U.S. When members join, they create a profile that summarizes their professional expertise and accomplishments. They can then form connections by inviting trusted contacts to join LinkedIn and connect to them.

---

[2] Monthly active users are Facebook members who have used the application within the past month.

LinkedIn groups enable members to ask and answer each other's questions, share relevant news and recruit for available positions. Sustainable development professionals have established a number of groups, including:

- Green (28,800 members) – for those who want to share ideas on environment, climate change, renewable energy, clean tech, sustainability, CSR and Green issues;
- Energy & Utilities Network (13,200 members) – for those people working in the industry over the long term to enable industry evolution, best practice and sustainability; and
- Sustainability Professionals (6,000 members) – for environmental sustainability professionals (energy, water, waste, recycling, green building, etc.) to help them network and communicate.

There are also smaller niche groups dedicated to such professions as:

- Offshore Wind Professionals (540 members) – used to bring professionals together who work in the offshore wind energy sector: turbine manufacturers, construction, consultancy, finance, electrical, marine coordination, cables, vessel operators, wind assessment analysts, engineers, sales, academic and government; and
- Urban Design Network (510 members) – network of professionals who shape the use of urban space. Includes: urban planners; architects; landscape architects; project managers; real estate developers; engineers; environmentalists; GIS specialists; and elected officials.

Some professional associations are beginning to establish LinkedIn groups for their members. For example, groups now exist to support networking by the members of associations such as:

- Chartered Institution of Water & Environment Management; and the
- International Ecological Engineering Society

These groups, however, tend to be very small (<20 members each) with little strategic promotion undertaken by the associations to their members.

3.2   SD social networking within niche sustainable development SNSs

In order to maximize contacts among those interested in sustainable development, many sustainable development-specific SNSs have been created. The best known of these sites have been developed as stand-alone SNSs with customized technology platforms. However, the creation of "out-of-the-box" SNS platforms and hosted services provide cheaper and easier ways for the sustainable development community to launch a wide variety of new niche communities.

3.2.1 Stand-alone sustainable development SNSs

Stand-alone sustainable development SNSs tend to be full-scale integrated social media and SNS platforms. In addition to the standard SNS and social media tools, most have developed additional functions specific to the needs of activists and non-profits.

The largest online general sustainable development SNSs are:

- TakingITGlobal – http://www.takingitglobal.org was founded in 2000 to enable and facilitate youth-led action. While not explicitly about sustainable development, the global issues (e.g., peace and governance, health, environment, human rights) around which its 230,000 members from 261 countries organize, are clearly at the heart of sustainable development thinking. The site—available in 12 languages—contains action tools (petition tools, groups, event calendar, commitments and projects); youth media (blogs, video, games, zine); and issue guides. There are also regional views enabling youth to network in their country, state/province and city.
- Change.org – http://www.change.org was founded in the summer of 2005. Change.org launched the first version of its site in 2007 and now has nearly 4,000 members from 55 countries. Targeted towards young Americans, the site enables individuals to blog, post videos, indicate support for various causes, donate funds to U.S. non-profits and track actions they have taken on an issue.
- Changents – http://www.changents.com is a storytelling and social networking platform where Change Agents can broadcast their stories, elevate their public profiles and build a fan-base of "Backers" around the world. Participants can back a Change Agent by assuming the roles of "Fan" (a shout-out of support); "First Responder" (being on-call if their Change Agent gets in a pinch); "Buzz Builder" (promoting their Change Agent's stories and Action Requests through viral sharing); "Angel" (helping fill their Change Agent's piggy bank); and "Advocate" (influencing policy-makers with respect to their Change Agent's cause). The innovative "Ripple" tool enables members to visualize how actions they take (and suggest to others) are picked up and making a difference around the world. "Changents" appear to number 80 at the present time.

Some SNSs have also been developed to deal with more specific issues. These enable the development and sharing of more targeted strategies and tools:

- Corporate social responsibility and social entrepreneurship:
  - JustMeans – The http://www.justmeans.com/ social media platform consists of three sections—jobs, news and networks—and engages companies and individuals

Social Networking and Governance for Sustainable Development

in conversations and initiatives covering social and environmental responsibility. The JustMeans platform reaches beyond the traditional realm of networking by connecting individuals with individuals, individuals with companies, and companies with companies. The JustMeans news and blog section increases awareness and provides access to information on programs and advancements in the field of social responsibility. The 2,000-plus job listings on JustMeans offer another level of individual and corporate interaction, as individuals can pursue both professional goals and commitment to social responsibility. In addition to its broad reach as a social media platform (e.g., a half million unique visitors to the site in 2008), JustMeans has 25,000–30,000 individual members as well as 100 paying corporate clients.

o UnLtdWorld – http://www.unltdworld.com/ provides social entrepreneurs with indispensible connections, information and insight. On UnLtdWorld users can search and share resources, such as toolkits, documents, events, funding information and organizations. Each resource has a dedicated page where relevant content can be added to one's profile and shared with others. Similarly, members can share information about the products and services their social enterprise provides, as well as post photos, videos and ask questions of other members. While nearly 40 per cent of the membership is located in the United Kingdom, UnLtdWorld's 7,500+ members are located in 90 countries.

- Sustainable Consumption/Lifestyles:
    o SustainLane – http://www.sustainlane.com is filled with personal accounts of how-to's, news, and local business and product reviews for sustainable living.
    The site connects interested consumers with the tools and information on everything related to green, including the largest directory of local, green-friendly businesses in the United States with over 20,000 small business listings; and consumer-generated how-to's, news and product reviews of new green offerings in the marketplace.
    o People For Earth – http://www.people4earth.net/ is both a social network and a wiki ECO guide with the purpose of inspiring and empowering people to enjoy more eco-friendly and fulfilling lives. They seek to contribute to saving the Earth and help individuals grow to be much better people. The network appears quite new, given that it has slightly fewer than 200 members from 20 countries.

- Climate Change:
    o Make Me Sustainable – http://makemesustainable.com/, founded in 2004 (although still in public beta stage), seeks to create a community of people concerned with their environmental footprint in order to network, spread the word

and effectively mitigate their individual and communal impact. Users can sign up as individuals, families or companies. The heart of the site is an easy-to-use Carbon and Energy Portfolio Manager that allows users to evaluate various facets of their energy consumption and take the necessary steps to reduce their carbon footprint. The user base appears to be 29,000 in number (not verified).

- o Edenbee – http://www.edenbee.com/ is an online community of people working to combat climate change. Site tools help users measure their current carbon footprint and create tailored goals to reduce it. People can track their goals over time and see the effect in their own personal "Carbon Timeline." Community features enable members to ask each other for suggestions and advice, as well as form groups and work on a common goal. Groups can track their group footprint, discuss goals and ideas and cheer each other on. It currently has approximately 1,500 members, primarily from the U.K.

- o 2People – http://www.2people.org/ seeks sustainability in one generation. Their immediate goal, however, is to build an overwhelming public mandate for real solutions to the climate crisis. Their community of just over 1,000 members help each other find ideas and form teams, whether it's for taking political action, greening your lifestyle or letting others know about what people are doing.

There are numerous additional stand-alone sustainable-development oriented SNS on the Web. However, their memberships tend to be <1,000 members and they may be short-lived. Many have appeared and disappeared in the past three years. Even promising SNSs such as the Global Urban Sustainable Solutions Exchange (GUSSE, 2006) ultimately were unable to secure long-term funding and dissolved after initial design and development phases. Although niche sustainable development-oriented SNSs appear to provide a much greater set of tools for users to interact with each other than are available through using mainstream SNS groups, many suffer from a lack of marketing and business expertise necessary to be successful in the long term.

3.2.2 "Out of the box" and hosted sustainable development SNSs

The development of "out of the box" SNS platforms such as Community Server (http://communityserver.com/) and hosted services such as Ning (http://www.ning.com/) and KickApps (http://www.kickapps.com/) have made it less expensive for organizations and networks to take advantage of these technologies. As a result, there has been an explosion of new SNSs which have emerged to address specific sustainable development interests and challenges. Due to the lack of searchable directories for KickApps and Community Server-powered SNSs, it is difficult to assess the degree of their uptake for sustainable development purposes. However, a search on Ning returns over 600 SNSs hosted for those involved in environment and sustainability issues.

One of the most important impacts of these SNS platforms has been the emergence of place-based SNSs. Traditionally, many within the sustainable development community have embraced the notion

of "Think globally, act locally." Geography—and the ability to join online communities at multiple geographic scales—is extremely important for sustainable development. However, it is a niche that has not been filled by any of the other SNS types. Ning, however, is now powering groups as diverse as:

- Sustainable Development Africa – http://africasustainable.ning.com/;
- Tampa's Sustainable Future – http://sdattampa.ning.com/;
- Taboan Mindanao – http://www.taboan.net/ (a social network of individuals and organizations promoting sustainable development of Mindanao, Philippines);
- EcoCaribe – http://ecocaribe.ning.com/;
- The Pacific Integrated Knowledge Ohana – http://pikohawaii.ning.com/; and
- Local Food Cleveland – http://localfoodcleveland.ning.com/.

SNSs enable the development of a collective understanding of the challenges facing a region, as well as the resources and expertise available to address those challenges. By making relationships within the community more transparent, through the exchange of personal information, photos, and regular interaction, SNSs also may help to generate a stronger sense of trust and commitment.

The other impact of "out-of-the-box" and hosted SNSs has been the transformation of formerly e-mail-oriented communities of practice (CoPs) into social networks. All manner of professional and workplace-oriented networking has shifted to Ning-powered communities. Examples include:

- Research and Media Network – http://researchandmedia.ning.com/ Bringing people together to improve communication of research findings;
- Development Crossing – http://responsible.ning.com/ A network of professionals engaged in corporate social responsibility (CSR) and sustainable development; and
- Africa Sustainable Energy – http://sustainableenergyinafrica.ning.com/ A networking community for people who are professionally involved or interested in sustainable energy in Africa.
- Waterspheres – http://www.waterspheres.com/ The online community for water sector professionals.

3.3   SD social networking within other Web 2.0 sites with SNS features

Social network sites are part of the broader constellation of Web 2.0 sites and services. Many other Web 2.0 user-developed content services have added some SNS components enabling members to subscribe to each other's content. Users receive regular updates on new content added by other users to whom they have "subscribed". Importantly, these "subscription" lists enable users to view and traverse their lists of connections. Users of these services can easily find others who share their

perspectives and engage in dialogues with them about the content. However, the focus tends to be more on finding content than on finding people.

Examples of content oriented Web 2.0 services with SNS features include:

- YouTube – YouTube allows people to easily upload and share video clips on http://www.YouTube.com and across the Internet through Web sites, mobile devices, blogs and e-mail. YouTube has also partnered with organizations and corporations to sponsor video contests focusing on specific issues. The Davos Debates contest (http://www.youtube.com/thedavosquestion) provides an example of how this platform can raise the profile of sustainable development issues and individuals. YouTube also runs a Nonprofit Program (http://www.youtube.com/nonprofits) in the United States and the United Kingdom providing additional marketing to videos and video channels developed by qualified NGOs.
- Blogger – Blogger is a blog (Weblog) publishing system. As one of the earliest dedicated blog-publishing tools, it is credited for helping popularize the format. Many blogs provide commentary or news on a particular subject; others function as more personal online diaries. A typical blog combines text, images and links to other blogs, Web pages, and other media related to its topic. The ability for readers to leave comments in an interactive format is an important part of many blogs.
- Twitter – Twitter asks one question, "What are you doing?" Answers must be under 140 characters in length and can be sent via mobile texting, instant message or the Web. In countries all around the world, people follow the sources most relevant to them and access information via Twitter as it happens—from breaking world news to updates from friends. "Tweets" become intertwined into conversations that span personal networks. Non-profit organizations from around the world are increasingly using twitter as a low cost communications tool. (Cohen, 2009)
- Flickr – Flickr is an image and video hosting Web site, Web services suite and online community platform. In addition to being a popular Web site for users to share personal photographs, the service is widely used by bloggers as a photo repository. Its popularity has been fuelled by its organization tools, which allow photos to be tagged and browsed by folksonomic means.

The amount of user-generated content being shared among users on these sites is enormous. YouTube is the fourth largest Web site and the second largest search engine in the world. In November 2008, according to Nielsen, they served 5.56 billion video clips to over 82 million people (Nielsen Online, 2008). As of November 2008, Flickr hosts more than three billion images (Champ, 2008). And Technorati indicates that there are over 133 million blog records posted online since 2002, with another 90,000 blog entries added daily (Technorati, 2008).

In addition to mainstream Web 2.0 sites, there are a wide variety of sustainable development sites powered by social media technologies (e.g., http://www.ecogeek.org/, http://www.treehugger.com/ and http://www.worldchanging.org). These provide valuable news feeds and forums for conversations about sustainable development issues and current affairs. However, these are not reviewed in this paper since they lack social networking tools to connect users with each other.

All of these services support vast amounts of sustainable development content and vast networks of individuals concerned with environment and development considerations. However, it is difficult to quantify the size and impact of these communities given their rapid growth and de-centralized nature.

4.0   Potential Impacts of SNSs on Sustainable Development

The following is a preliminary survey of some changes in support of sustainable development that can be observed among those active in social networking sites. Given the lack of research in this field, it is not yet possible to quantify the degree to which these changes are impacting on people's lives and behaviours. Additional research will be necessary to validate this direct observation of the communities and anecdotal evidence.

4.1   Changes in how people learn about sustainable development issues

Since the early 1970s sustainable development has moved from the realm of activist politics to professional implementers to the popular vocabulary. Earlier media tools such as television, radio, newspapers, journals and Web sites were used by sustainable development advocates to attempt to "sell" the concept. However, these were largely one-way conversations from experts to their stakeholders and audiences. Capturing people's attention was an ongoing challenge.

SNSs are now enabling the spread of sustainable development concepts more rapidly through peer learning. People pay attention to what their trusted sources and friends have to say. Information is moving rapidly between and across social networking sites through both technology features (e.g., Twitter "tweets" can be automatically uploaded and displayed as Facebook status updates), but also through key individuals active on multiple platforms. As Malcolm Gladwell notes in *The Tipping Point*, ideas, products, messages and behaviours spread just like viruses (Gladwell M. , 2000). Similar to medical epidemics, a handful of special people play an important role in starting idea epidemics. They translate the message of innovators into something we can understand. They alter it in such a way that extraneous details are dropped and others are exaggerated so that the message itself comes to acquire deeper meaning. To begin an idea epidemic, the following roles and skill sets must be present in a social network:

- Mavens – These individuals are idea specialists. They are human databanks who are obsessive about details and about sharing them with others;
- Connectors – Connectors are people specialists. They know a lot of people from every possible sub-culture and niche. They have an extraordinary knack for making friends and acquaintances out of everyone from a farmer in a village in Ethiopia to vice-presidents of international banks. They act as social glue by spreading ideas around; and
- Salespeople – These individuals have the skills to persuade us when we are unconvinced of what we are hearing. They are masters of the art of emotional expression and draw people into their own conversational rhythms on a completely subconscious level.

With improved SNS tools, mavens, connectors and salespeople are all becoming more efficient and effective at initiating idea epidemics.

The result for sustainable development is that:

- Sustainable development values and principles are diffused through peer networks – Those who may not be aware of sustainable development become cognizant of the commitment of their friends and peers towards building a more sustainable future in their personal and professional lives. They become aware of the basic principle that a different future is possible, if we choose to change our policies and practices on a variety of levels from the household to the organization to the social. Topics which people may not have discussed previously are opened for discussion.
- Specialized knowledge is becoming visible to lay people – New advances in research and product development are being shared by experts with their vast networks of friends, many of whom are not specialists. By posting links to their most recent work in mainstream sites, it opens the possibility for other friends and contacts to become aware of fields of work and research that they weren't even aware existed before. This approach also enables lay people to more confidently comment on areas outside their expertise, since they are interacting with friends about it.
- Small-scale issues and local concerns may gain a global audience more rapidly – Individuals in developing countries who have global networks of friends are serving as international amplifiers for local sustainability issues. Their blogs, and even links to local news stories from their status lines, enable others to quickly learn about events and to share them with others. Similarly, innovations in a particular field may be more rapidly shared with colleagues working halfway around the world—or even in the next province.
- Issues and solutions go viral quickly – In the fast-paced world of SNSs, information is spread at the speed of a few clicks. Entertainment-based information spreads quickly, with little regard for whether it is based in good science or good policy. Presentation and substance receive equal weight in what is passed along.
- Disciplinary gaps may be more easily bridged – While professional networking has long existed within specific disciplinary communities and within specific locales, the growth of access to online networking tools over the past two decades has led to a massive growth in global cross-disciplinary conversations. These conversations can introduce terminology and concepts rapidly from one field to another.

4.2   Changes in what is considered action for sustainable development

On mainstream SNSs, the notion of sustainable development action has been somewhat "dumbed down" to a lowest common denominator. While this is somewhat inevitable in order to ensure broad-scale support for a complex idea, it is still somewhat troubling. Through SNSs, people have become accustomed to feeling good about themselves for sending virtual plants to each other (at which point a corporate ad sponsor pays to save the rainforest), indicating they are "fans" of

organizations or causes, and creating lists of the green actions they already take in their daily lives. These are very low-cost actions for individuals to take. While they may build awareness of issues, there is no research indicating whether people gain a deeper commitment to sustainable development through these activities or whether these lead to taking additional actions.

Niche sustainable development SNS, fortunately, provide a more nuanced and varied perspective on what action may be. Many include analytical tools to enable people to inventory areas of their life in which improvements may be made (e.g., carbon calculators). Actions on these platforms sometimes even build an awareness of the need for political action as well as personal. Unfortunately, in an effort to make people feel like they are contributing to change, tools to support political activities often stop with the signing of petitions or pledges. TakingITGlobal is a notable exception with the provision of an action guide oriented towards enabling young people to begin local projects and activities. Where and how often that guide is used, however, has not been tracked.

Professional and business SNSs most closely mirror traditional notions of sustainable development action, with a strong emphasis on changing organizational and corporate behaviours. Actions are specific and information can be shared through these SNS-empowered communities of practice about overcoming the implementation challenges awaiting any change process.

4.3   Changes in the role of the private sector

The private sector has made significant advances in embracing the practice of sustainable development and corporate social responsibility (CSR) over the past two decades. However, SNSs have opened up new approaches to CSR for the private sector, through the ability to maintain dialogues with their stakeholders. Participating corporations have acknowledged that individuals have an interest in their activities and are seeking to proactively engage their stakeholders—if for no other reasons than to avoid the spectre of government regulations requiring a range of sustainable development actions and to align themselves with a young and hip socially conscious "brand." Avoiding potential allegations of greenwashing, in favour of honest conversations, is increasingly in their best interest.

It was interesting to note that corporate-sponsored sustainable development-themed SNSs are largely absent. The only such site located was the EcoTreadsetters community (http://www.ecotreadsetters.com/), launched by the Yokohama Rubber Company. The site includes global "green" news, exclusive interviews and performances by musicians, blogs, forums, eco tips for your car, community and life and calculators to measure personal carbon footprints. The site has attracted a community of just over 250 members, with few contributing regular postings at this time. Other corporations appear to prefer engaging with stakeholders through third party sites such as JustMeans, which are perceived as more neutral and independent.

One notable corporate innovator in the social networking world has been Timberland's Earthkeeper campaign (http://earthkeeper.com), which aims to inspire and engage one million people concerned about the environment. Rather than establish its own social network site, Timberland has made Earthkeepers ubiquitous throughout the social networking and broader Web 2.0 world. Earthkeepers has a YouTube channel, a Facebook page, and developed a Facebook application for planting virtual trees, which it matched by planting 500,000 real trees. In addition, Earthkeepers has an active presence on JustMeans and also is the sole partner in Changents.

4.4   Changes in the role of government

Government agencies have been largely invisible in the world of SNSs—none of the SNSs examined had active and visible presence by any government agency or personnel in an official capacity. This is not surprising since many government agencies actively block SNSs in the workplace in order to reduce any "wasting" of employee time. There are some government innovators working to develop SNS-enabling cross-departmental collaboration. As the U.S. Federal Web Managers Council notes, "Interagency and intergovernmental social networking sites can promote cooperation across government. Internal social networking sites can establish connections across traditionally stove-piped and geographically dispersed organizations" (Godwin, 2008). These types of cross-communication are essential to addressing the governance challenges of sustainable development as a holistic and transformative programme.

It is unfortunate that few government agencies appear to have a great deal of experience in working within a social networking context. As Andrea Di Maio, vice-president and distinguished analyst at Gartner notes, "The current global financial turmoil bolsters the case for government adoption of social networks as technology-budget cuts make tapping into societal resources, such as voluntary groups, philanthropists, associations and social network groups essential to complement weaker government action in some critical areas... However, the most promising, and yet, most disruptive, communities are those created outside government" (Gartner, 2008).

The emergence of Tweet Congress (http://tweetcongress.org/) and Tweetminster (http://tweetminster.co.uk/) in the past few months demonstrate how external Web 2.0 services can rapidly gain in popularity and bring new levels of transparency to government. These public services were created by citizens as an effort to encourage their elected representatives to engage in conversations with them through Twitter. Combining existing technologies, the two sites enable citizens to follow and to analyze politicians' tweets. As of March 2009, only seven per cent of British MPs and 27 per cent of the U.S. Congress have Twitter accounts. Beyond the elected representatives, there are many other government employees who are seeking to use Twitter to extend the communications reach of their agencies. The GovTwit directory (http://newthinking.bearingpoint.com/2008/11/20/govtwit-directory/) maintains a list of some of these for the United States. Most, however, are primarily used for communicating government

perspectives, rather than engaging in conversations or extending and solidifying relationships between agencies and constituents.

Clearly, government agencies—often perceived as essential partners for sustainable development — have a long road ahead of them if they wish to utilize SNS technologies to achieve their goals.

5.0   Implications for Sustainable Development Governance

Over the past decade, interest in the connections between social networks and governance has grown considerably. With the advent of social network analysis tools, researchers have begun to model how social networks impact political regime change, recruitment of individuals into social movements, and how social networks may build a commitment to collective action on a variety of issues. The Program on Networked Governance at Harvard University has become a focal point for collecting and promoting this research. As noted in the Program's "Complexity and Social Networks Blog," the list of network-related panels and presentations at formal meetings such as the American Political Science Association (APSA) is growing every year. (Lazer, Complexity and Social Networks Blog, 2008) Analyses of how social networks impact governance for sustainable development have included such diverse focuses as:

- The ability of poor governance to reverse positive change brought about through participatory approaches built upon existing social networks and social capital (Graham and Sol, 2004); and
- How adaptive governance systems often self-organize as social networks with teams and actor groups that draw on various knowledge systems and experiences for the development of a common understanding and policies (Folke, 2005).

However, there appears to be little research to date into online social networking sites and their governance impacts and implications. Stereotypes continue to abound that social networks are primarily for students interested in expanding their social lives. Alternately, others expound a vision (as yet untested) of loosely knit groups of individuals bound together through social networks which have gained the power to challenge even global superpowers (Moore J. F., 2005).

Which vision is correct? Are social networking sites driving the transformation of the governance landscape or are they merely diverting vast amounts of time from addressing the difficult sustainable development challenges at hand? And if they are useful tools for sustainable development, how can we ensure that they live up to their potential?

5.1   Are social networking sites changing governance for sustainable development?

At the most basic level, SNSs appear to be part of a broader trend towards technologies, networks and processes that are pushing for more accountable, transparent and connected governance. Sustainable development advocates are seeking to use these SNSs to influence who gets power, how decisions are taken and communicated, and how accountability is rendered. Within this context, some important trends are:

- The use of SNSs to elect political candidates who are supportive of sustainable development – While it has been *de rigeur* for many years to note that governance has moved beyond governments, governments are still important. Without elected officials who understand and promote policies that enable other sectors to pursue solutions, the long-term success of sustainability is in question. The importance of the use of SNSs by progressive campaigns cannot be overlooked.

- The use of SNSs to increase the transparency of governance – SNSs and social media have combined into a powerful force capable of illuminating previously unmonitored governance institutions and processes. While in the short term, this may lead to great upheaval as agencies and institutions deal with scandals and unsubstantiated rumours, in the long term such transparency may improve the accountability of all stakeholders.

- The role of SNSs in the construction of individual legitimacy and leadership – The degree to which individuals' online profiles are assumed to reflect their actual identity, accomplishments, interests and personal connections, may influence others' perceptions of their legitimacy to assume leadership roles on sustainable development issues. Aligning authority, legitimacy and responsibility may have governance benefits in democratic systems. However, the construction of online identity has proven fraught with challenges ranging from individuals maintaining multiple online identities (even within the same SNS), to individuals maintaining wholly fictitious identities—not necessarily for malicious intent, but out of individuals' desires for increased privacy and concerns for personal safety. Revealing too much information about oneself online can lead to real-world consequences for individuals who may be persecuted either for aspects of their lives or for their associations. Current Internet governance deliberations may have implications for the construction of online identity in the coming years.

- The role of SNSs in moving people from knowledge to action – People cannot move from knowledge to action without engaging in relationships which help them to gain confidence in their ability to adopt and adapt the information to their situation (Creech & Willard, 2001, pp. 35-44). SNSs can become valuable tools in building such relationships. As Facebook CEO Mark Zuckerberg is quoted as saying, "the other guys think the purpose of communication is to get information. We think the purpose of information is to get communication" (Dyson, 2007). With communication comes the foundation for relationships and collaborative action.

Whether you believe, however, that social networks are a key element in addressing the governance challenges at the heart of sustainable development depends largely on which of two competing sustainable development governance approaches you believe most accurately reflects the world. Rationalist democratic governance and adaptive governance reflect two poles in the debate about improving decision-making and implementation of sustainable

Social Networking and Governance for Sustainable Development

development. While there is no intrinsic incompatibility between the two approaches, they belie fundamental differences in the perceived centrality of uncertainty, feedback loops and risk to sustainable development decision-making. They also lead to slightly different prescriptions for institutional mechanisms for governing complex societies seeking to achieve more sustainable development.

5.1.1 *Rational democratic governance perspectives*

The rational democratic governance (RDG) approach is the most common approach to analyzing sustainable development governance and underlies the majority of research and capacity-building programs. As noted in the introduction to "Governance for Sustainable Development," the RDG approach asserts that, "One must believe that the task of sustainable development is a rational one: a process that can, to a reasonable degree, be 'steered' by governing procedures and institutions; and one must assume that governments committed to sustainable development are willing to alter existing governing systems in order to better achieve SD goals" (Lafferty W. M., 2004, p. 3). The RDG perspective highlights a number of institutional conditions that must be met in order to achieve sustainable development. For example, the OECD's expert panel concluded that effective implementation of sustainable development goals requires:

- A common understanding of sustainable development;
- Clear commitment and leadership;
- Specific institutional mechanisms to steer integration;
- Effective stakeholder involvement;
- Efficient knowledge management *(OECD, 2002, p. 5).*

These governance elements are similar to those proposed by other researchers looking at the European Union who detail a similar list of demanding components which would need to be incorporated into a governance system for sustainable development (Bomberg, 2004, pp. 62-63). Furthermore, according to RDG, the prerequisites for well-functioning, effective and politically legitimate *governance* are obviously much stronger than in a traditional sectoral *government* perspective. They include: (1) a strong political will and capacity to formulate clear goals; (2) conscious strategies for across-the-board internalization of sustainability objectives; (3) continuous commitment to monitoring and evaluation; and (4) continuous dialogue among politicians, implementing bureaucracies and all relevant target groups" (Lundqvist, 2004, pp. 100-101).

In general, rationalist democratic governance models assume that policy-makers approach the issues rationally, going through each logical stage of a process, and carefully considering all relevant information (Sutton, 1999):

- Problem recognition – Problems that may potentially make their way onto the public policy agenda are recognized.
- Agenda setting – Problems that are deemed worthy of attention are placed on the agenda.
- Policy formulation – Various policies are crafted to deal with the problem that has been set on the agenda.
- Policy adoption – An official policy is agreed upon.
- Policy implementation – The public policy that has been officially agreed upon is put into action.
- Policy analysis and evaluation – The implemented policy is evaluated for its effectiveness.

Various members of a policy community will be involved in each step. Some models put policy-makers at the centre of the policy process. Others, such as Sabatier's policy advocacy coalitions approach, focus on the power and influence flowing from the bonds and relationships of actors who share similar values and beliefs. These coalitions, which may be tightly or loosely coupled, are comprised of government agencies, interest groups, associations, think tanks, academics, university research centres, journalists and prominent individuals who more or less share common world views and generally agree on policy solutions. Sabatier predicts that two to four advocacy coalitions can be found in every policy community, with one emerging as the dominant coalition controlling the important levers of power at any particular point in time.

Rational democratic governance advocates might well be skeptical about the real impact of social networking sites. **If you believe that sustainable development is a largely logical process achieved through planning and government policy-making, social networking sites do not fundamentally alter the dynamics of the political landscape.** SNSs have neither the tools, nor the intent, to engage in structured policy analysis. SNSs are also too loosely structured for institutions to use to steer any orderly development process. Issues, fads, and people cycle too rapidly through them to be of great use. Moreover, while they may enable information to bridge the silos of government departments, they lack the intellectual rigour and structure which might enable them to integrate the complex issues behind sustainable development challenges. They add little to the type of knowledge management which, from this perspective, needs to underlie decision-making. Even in terms of public participation in decision-making, RDG advocates are pulling back from engaging citizens-at-large to focus on key stakeholder approaches based on affiliation with institutions (Meadowcroft, 2004). Since SNSs function at the level of the individual, rather than their institutional position, they are of little use to target and engage more select groups.

The value-added of social networking sites would thus be limited to:
- Assisting policy advocacy coalitions to form – The value-oriented conversations and communities embodied in SNSs may assist in the identification of like-minded individuals and organizations. SNSs may also strengthen relationships between individuals within a

given policy advocacy coalition by blurring the distinction between personal and professional relationships and commitments.

- Fostering preconditions for successful policy implementation – If policies do not achieve what they are intended to achieve, blame is often not laid on the policy itself, but rather on political or managerial failure in implementing it. It is possible that SNSs may help to foster some of the contextual factors which have been identified as necessary preconditions for implementation. Factors of motivation, information and power influence both the "take off" phase of implementation process and the adequacy of implementation (Bressers, 2004, p. 294). These factors combine to determine whether the interaction between government and other social actors leads to cooperation (active, passive or forced), opposition, or joint learning. If SNSs can be shown to improve motivation, information, and power balances, they may be useful tools for setting the stage for sustainable development.

- Enabling professional communities to share implementation-related knowledge – Business-oriented SNSs are achieving a critical scale which is enabling the expansion of sustainable development communities of practice (e.g., Offshore Wind Professionals). SNSs may be valuable tools if they foster greater trust and knowledge sharing within professions which will be called upon to develop and expand the array of technical solutions available.

However, the RDG perspective leads to several cautionary notes of great importance:

- Dumbing down sustainability – At a time in which we need tools to be able to communicate the complexity and integratedness of issues, mainstream SNSs seem to be leading to "dumbing down" sustainability to a lowest common denominator. If people begin to believe that they are "doing their part" by sending virtual fish to each other, we are in trouble. Even more dangerous is the likelihood that sustainable development values will simply be overwhelmed by the relentless drive towards nostalgia and consumerism embodied in mainstream SNSs. At a time when we need people to be future-oriented and to consider deep changes in production and consumption, people are turning to SNSs to celebrate their love of the status quo.

- Sustainable development may fall prey to the effects of "divide and conquer" – The proliferation of SNSs is dividing the global sustainable development community into communities and conversations which lack the scale to challenge global trends. Members of potentially progressive policy advocacy coalitions are scattered among scores of SNSs, both mainstream and niche. Regional divisions and the lack of linguistic tools to help unify discussions are undercutting their effectiveness.

For these reasons, the rational democratic governance perspective would urge, at most, a cautious use of SNSs as they are constituted at present.

Social Networking and Governance for Sustainable Development

5.1.2 *Adaptive governance*

The adaptive governance perspective is based on a strong appreciation for the challenges of dealing with complexity, uncertainty and risk. The majority of adaptive governance research explicitly or implicitly has its roots in "Panarchy" (Gunderson & Holling, 2002) and the efforts of the Environmental Advisory Council to the Swedish Government in the run-up to the Johannesburg Summit in 2002. While focused primarily on adaptive management at the ecosystem level, these early works do note the broader governance implications for adaptive management. They note that the challenge for governance lies in the heart of open processes and continuous learning, rather than in determined outcomes (Rammel, Hinterberger, & Bechtold, 2004, p. 6). Adaptive management proceeds by a design that simultaneously allows for tests of different management policies and emphasizes learning as we use and manage resources, monitoring and accumulating knowledge on the way, and constantly adjusting the rules that shape our behaviour to match the dynamics and uncertainty inherent in the system. The adaptive management approach treats policies as hypotheses, and management as experiments from which managers can learn, accepting uncertainty and expecting surprises. (Folke, et al., 2002, p. 45)

With respect to institutions and policies, adaptive governance strives to connect individuals, organizations, agencies and institutions at multiple organizational levels. Key persons provide leadership, trust, vision, meaning and they help transform management organizations toward a learning environment. Adaptive governance systems often self-organize as social networks with teams and actor groups that draw on various knowledge systems and experiences for the development of a common understanding and policies. The emergence of "bridging organizations" seems to lower the costs of collaboration and conflict resolution, and enabling legislation and governmental policies can support self-organization while framing creativity for adaptive co-management efforts (Folke, Hahn, Olsson, & Norberg, 2005). Folke et al. also argue that diversity and redundancy of institutions and their overlapping functions across organizational levels may play a central role in absorbing disturbance and in spreading risks. Hence, it is an important challenge to overcome common perceptions of inefficiencies associated with redundancy, namely fragmentation and duplication of authority, policy inconsistencies and high transaction costs (2005, p. 453).

In recent years, the adaptive governance perspective has embraced theories of co-evolution with its emphasis on transitions and change. Focusing on transition management for sustainable development, they suggest that "adaptive capacity must express the duality of adapting to change (responding adaptively to trigger signals and disturbances expressed by conflicts) and shaping change (to initiate sustainable transitions towards consensual visions of sustainability to avoid conflicts)" (Rammel, Hinterberger, & Bechtold, 2004, p. 11). The focus on crisis moments and windows of opportunity was expanded further by Folke et al. who note that we must concentrate on experiences

of adaptive governance of social-ecological systems during periods of abrupt change (crisis) and investigate social sources of renewal and reorganization.

From the perspective of adaptive governance, social networks are at the heart of governance for sustainable development. Social networking sites which extend the power and reach of social networks are a powerful force for transforming social learning and the steering of the sustainable development agenda. Without strong and effective SNSs, there is little chance that we will break free of the institutional constraints which have led to fragmented decision-making in the past. Breaking down the barriers between people, institutions, and mental disciplines is the ONLY way in which society will be able to overcome the challenges confronting us today. Furthermore, sustainable development is a transformative goal and traditional tools will never lead to social transformation. It is only in shaping the quality and quantity of daily interactions amongst people that we have a chance to shape more sustainable systems. As Voß and Kemp note in the introduction to "Reflexive Governance":

> "There are no established, overarching competencies and procedures for shaping structural, 'governance of governance' change. Transformation thus appears to happen uncontrolled as a result of daily interactions between consumers, producers, policy makers, researchers, journalists and various other actors. Actors involved in shaping socio-ecological transformation follow their own vital interests, partly in cooperation and partly in conflict. And they each have power over specific resources to enforce their strategies. Transformation, ultimately, results from the intended and unintended effects of these fuzzy interactions. In contrast to 'normal' policy arenas such as health or energy, the governance of transformation is not institutionalized. This is also the case for informal policy networks in which all important actors work towards a collective strategy for sustainable development" *(Voß & Kemp, 2006, p. 17).*

The power of SNSs to lead to improved governance for sustainable development rests on two key factors: improvements in social learning and embracing the breadth of steering.

- Improving social learning – Social learning involves "processes of learning that take place on a collective level constituting changes that are more than the sum of individual contributions to it… this understanding comprises collective learning processes on a spectrum of different levels of aggregation ranging from local community groups, to commercial or non-profit organizations, to societal sub-systems such as the economy, the scientific community or the governmental system up to the entire society" (Siebenhüner, 2005, p. 88). SNSs extend the classic observation on the importance of weak ties—links to casual acquaintances—to social learning. As noted by Granovetter as early as 1973, weak social ties are responsible for the majority of the embeddedness and structure of social networks in society as well as the

transmission of information through these networks. Specifically, more novel information flows to individuals through weak rather than strong ties. Because our close friends tend to move in the same circles that we do, the information they receive overlaps considerably with what we already know. Acquaintances, by contrast, know people that we do not, and thus receive more novel information (Granovetter, 2004). Technologies such SNSs which enable people to manage large networks of acquaintances allow us to maintain the weak ties that bring novel information into our lives and to spark innovation.

- Recognizing the many forms of steering – According to adaptive governance proponents, "Steering takes place in different social settings and on different levels of societal organization. Public policy on different levels plays an important role, but it is not the single most relevant form of steering in society. Steering also takes place within organizations such as business companies, non-profit organizations and administrative agencies. Apart from these formal and comprehensive modes of steering in policy and management, there are complementary and interfering actions that are equally aimed at bringing societal systems from one state to another. These are, for example, the writing of journalists who intend to shape public discourse, the work of scientists who aim to establish problem definitions and expectations, public mobilization of environmental organizations aiming at a consumption boycott, or negotiations between companies who agree on common standards of performance" (Voß, Newig, Kastens, Monstadt, & Nölting, 2006). Through SNSs, the definition of issues and what constitutes sustainable development can be seen to have moved beyond the environment and policy professionals to those involved in a wide variety of private-sector occupations, as well as to the realm of the committed activists and concerned citizens. The sharing of value statements and links to blogs and other specialized information sources is diversifying and extending the base of knowledge upon which sustainable development decision-making is being built. **As more individuals share sustainable development concerns and solutions with their networks of contacts and friends, they are influencing each other's notions of priorities and possibilities for the future. This establishes the foundation for future policy-making whether at the organizational or societal levels**.

From the perspective of adaptive governance, there are some cautionary notes regarding the operations of SNS today:

- The danger of small networks – There is some risk that efficient information sharing within networks could lead to a narrowing of agendas over time as networks stabilize on sub-optimal solutions and the lowest common denominator of opinion. This is particularly a danger for small networks (Lazer & Friedman, 2006).
- The danger of dominant networks – Similarly, there is some concern that networks may *intrinsically* reduce the choices available to us. This can be dangerous from an adaptive

governance perspective which values the preservation of local knowledge and a wide variety of decision options for the future. David Singh Grewal points out in "Network Power" that networks are the means by which globalisation proceeds. (Singh Grewal, 2008) Networks can impinge on our political autonomy, channelling it into situations where dissent is possible but pointless. Although people enter them freely, networks, like political systems, can bias outcomes. A new order can be camouflaged as a broadening of options (Caldwell, 2008).

For these reasons, adaptive governance proponents would support the rapid expansion of a wide variety of social networking sites enabling more distributed and informed decision-making about sustainable development.

5.2   Capitalizing on SNSs for improving governance for sustainable development

If we are to make the most out of the potential governance benefits of social networking sites and to address the potential pitfalls, various actions will be necessary by a wide variety of people and institutions engaged in sustainable development. The following preliminary outline of approaches may be useful as institutions and individuals decide how best to capitalize on SNSs.

- Individuals working professionally on sustainable development – People working towards more sustainable development need to establish a presence for themselves. If new to social networking, an individual may want to limit her/himself to one each of mainstream, professional and niche SNSs. Creating a profile, sharing information and cultivating meaningful interactions within a community does take time—time that will extend above and beyond an average work day. But the viral impact of updating extended networks of family and friends in the evening about what one believes in and works on during the day cannot be underrated.

- Employers, in particular in the government sector, must establish policies that will guide an individual's access, time and effort spent in utilizing SNSs to further the sustainable development agenda.

- Organizations, businesses and government agencies – Organizations of all types should also ensure that they have a presence within multiple SNSs. Similar to individuals, organizations new to social networking may want to limit themselves to one each of mainstream, professional and niche SNSs. The form of organizational profile may vary depending on the site, but usually includes mechanisms to profile the organization, to link to its Web site, and to enable various forms of affiliation with the organization (i.e., whether as staff or simply as fans).

- Associations and networks – All sustainable development associations and networks with a membership base of individuals should strongly consider creating their own SNS using one

of the "out-of-the-box" or hosted platforms. These technologies can help members to network more easily with each other and improve the achievement of collective goals. Those networks and associations in which institutions are members (rather than individuals) should consider whether the creation of an individual-oriented SNS might help them to achieve their goals.

- Mainstream SNSs – Mainstream SNSs will need to be persuaded to expand their group tools to match those provided by many niche SNSs (e.g., TakingITGlobal). Unthreaded discussion boards, flat walls, no support for clustering links and documents, and no support for group email interaction make it difficult for groups to interact and to build a collective understanding of issues.

- Niche Sustainable Development SNSs – Let a thousand flowers bloom. Championing a multiplicity of SNS forms and approaches may help to ensure that a wider variety of sustainable development options remains open to us. Just as the diversity and redundancy of institutions and their overlapping functions may play a central role in absorbing disturbance and in spreading risks, so too may the diversity and redundancy of SNSs. As Timberland has done with its Earthkeepers campaign, an institution may wish to work through both mainstream SNSs and establish a niche site as well.

- Web application developers – We must move beyond fundraising and social games in application development. While these may be good tools for introducing sustainable development to a broad audience, it is important that their implementation leads people towards a deeper understanding of and engagement in critical issues. It is important to recognize the potential of social media and mashups[3] to work with SNSs to mobilize individuals for sustainable development ends. Without content, without data, communities are powerless. When there are mashable data, and applications that present the data in easily understandable formats, it is easier for people within SNSs to digest and to discuss it, and, eventually, to make decisions and to take action. Some cities are beginning to experiment with what might be possible. "When you open up the data, there's no limit to what people can do," said Toronto Mayor David Miller. "It engages the imagination of citizens in building the city" (Tossel, 2009).

Beyond these direct activities, it is important to cultivate an environment within which social networks can be used to their greatest advantage. James F. Moore, former Senior Fellow at Harvard Law School's Berkman Center, argues that activists must work at this crucial time to ensure that they:

---

[3] In Web development, a mashup is a Web application that combines data from more than one source into a single integrated tool. An example is the use of cartographic data from Google Maps to add location information to real-estate data, thereby creating a new and distinct Web service that was not originally provided by either source. (Source: http://en.wikipedia.org/wiki/Mashup_(web_application_hybrid))

Social Networking and Governance for Sustainable Development

- explore how to make our individual sense-making and collective action more effective;
- insist on an open Web, an open cyberspace, around the globe, because that is the essential medium in which the our collective governance power lives;
- support international institutions, so that they collectively form a setting in which networked power can be exercised; and
- work on themselves and their communities to build greater wisdom and to reinforce their commitment to making good decisions in their daily lives (Moore J. F., 2005).

6.0 Works Cited

(n.d.). Retrieved March 24, 2009, from Us Now: http://www.usnowfilm.com/

Nielsen Online. (2008, December 17). *News Release: Weekdays Outpace Weekends for Online Video Viewing.* Retrieved January 3, 2009, from Nielsen: http://www.nielsen.com/media/2008/pr_081217a_download.pdf

Beisel, D. (2006, February 9). *Vertical Social Networks.* Retrieved December 4, 2008, from Genuine VC: http://www.genuinevc.com/archives/2006/02/vertical_social.htm

Bomberg, E. (2004). Adapting Form to Function?: from economic to sustainable development governance in the European Union. In W. M. Lafferty (Ed.), *Governance for Sustainable Development: The Challenge of Adapting Form to Function* (pp. 61-94). Cheltenhan, UK: Edward Elgar.

Boyd, D. M., & Ellison, N. B. (2007). Social Network Sites: Definition, History, and Scholarship. *Journal of Computer-Mediated Communication , 13* (1), http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html.

Bradwell, P., & Reeves, R. (2008, October). *Network Citizens.* Retrieved November 21, 2008, from Orange Future Enterprise Coalition: http://www.orangecoalition.com/whitepapers/download.php/10

Bressers, H. T. (2004). Implementing sustainable development: how to know what works, where, when, and how. In W. M. Lafferty (Ed.), *Governance for Sustainable Development: The Challenge of Adapting Form to Function* (pp. 284-318). Cheltenhan, UK: Edward Elgar.

Caldwell, C. (2008, May 23). Networks that Work Too Well. *Financial Times* , p. http://us.ft.com/ftgateway/superpage.ft?news_id=fto052320081343411263&page=1.

Champ, H. (2008, November 3). *3 Billion!* Retrieved January 3, 2009, from Flickr Blog: http://blog.flickr.net/en/2008/11/03/3-billion/

Christakis, N. A. (2008, February 25). *Social Networks are Like the Eye.* (J. Brockman, Ed.) Retrieved February 11, 2009, from Edge: http://www.edge.org/documents/archive/edge238.html

Cohen, L. S. (2009, March 19). *Mashable.* Retrieved March 19, 2009, from 26 Charities and Non-Profits That Tweet: http://mashable.com/2009/03/19/twitter-nonprofits/

Creech, H., & Willard, T. (2001). *Strategic Intentions: Managing Knowledge Networks for Sustainable Development.* Winnipeg: International Institute for Sustainable Development.

Dyson, E. (2007, June 13). *Release 0.9: Notes for a Talk (Facebook).* Retrieved February 8, 2009, from The Huffington Post: http://www.huffingtonpost.com/esther-dyson/release-09-not_b_51959.html

Feek, W. (2008, November 5). *ChangeNet: The Lessons from Obama's campaign for International Development Democracy and Governance Policy and Action.* Retrieved February 11, 2009, from The Communication Initiative Network: http://www.comminit.com/en/node/279777/bbc

Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C., Walker, B., et al. (2002, April). *Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations.* Retrieved October 23, 2008, from UN International Strategy for Disaster Reduction: http://www.unisdr.org/eng/risk-reduction/sustainable-development/resilience-sd.pdf

Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive Governance of Social-Ecological Systems. *Annual Review of Environmental Resources , 30*, 441-73.

Gartner. (2008, October 3). *Gartner Says Citizen Social Networks Will Complement, and May Replace, Some Government Functions .* Retrieved January 5, 2009, from Gartner: http://gartner.com/it/page.jsp?id=784212

Gladwell, M. (2008, May 13). *Social Networking Explosion: My Portable Friends.* Retrieved December 4, 2008, from Social Media and Green Living: http://www.maxgladwell.com/2008/05/social-networking-explosion-my-portable-friends/

Gladwell, M. (2000). *The Tipping Point: How Little Things Can Make a Big Difference.* Boston: Little, Brown.

Godin, S. (2009, January 21). Spark: Whoppers, Ethical Marketing, and Leadership 2.0. (N. Young, Interviewer) CBC. http://podcast.cbc.ca/spark/spark_20080115_sethgodin.mp3.

Godwin, B. (2008, November 19). *Social Networks and Government.* Retrieved January 24, 2009, from Webcontent.gov: http://www.usa.gov/webcontent/technology/social_networks.shtml

Graham, J., & Sol, N. (2004, August). *Rethinking Governance, Social Conflict and Livelihood Choices: Stories from Prieto Diaz, Philippines.* Retrieved November 27, 2008, from Digital Library of the Commons: http://dlc.dlib.indiana.edu/archive/00001403/00/Graham_Rethinking_040511_Paper108d.pdf

Graham, J., Amos, B., & Plumptre, T. (2003, August). *IOG Policy Brief No. 15: Principles for Good Governance in the 21st Century.* Retrieved January 15, 2009, from http://www.iog.ca/publications/policybrief15.pdf

Granovetter, M. (2004, Winter). The Impact of Social Structure on Economic Outcomes. *Journal of Economic Perspectives* , pp. 33-50.

Granovetter, M. (1973, May). The Strength of Weak Ties. *American Journal of Sociology , 78* (6), pp. 1360-80.

Günther, D., & Newig, J. (2006, December 9). *Network Governance, Institutional Learning and Environmental Effectiveness: How network structures support institutional learning.* Retrieved January 24, 2009, from Institutional Dimensions of Global Environmental Change (IDGEC): http://www2.bren.ucsb.edu/~idgec/presentations/Jens_Newig.ppt

Gunderson, L. H., & Holling, C. (Eds.). (2002). *Panarchy: Understanding Transformations in Human and Natural Systems.* Washington: Island Press.

GUSSE. (2006, May 19). Retrieved February 11, 2009, from University of British Columbia's Official World Urban Forum Web Site: http://www.ahva.ubc.ca/WUF/program/gusse.html

Hendrickson, M. (2007, July 24). *Nine Ways to Build Your Own Social Network.* Retrieved December 4, 2008, from TechCrunch: http://www.techcrunch.com/2007/07/24/9-ways-to-build-your-own-social-network/

Lafferty, W. M. (2004). Governance for sustainable development: lessons and implications. In W. M. Lafferty (Ed.), *Governance for sustainable development: The challenge of adapting form to function* (pp. 319-360). Cheltenhan, UK: Edward Elgar.

Lafferty, W. M. (2004). Introduction. In W. M. Lafferty (Ed.), *Governance for Sustainable Development: The Challenge of Adapting Form to Function* (pp. 1-31). Cheltenhan, UK: Edward Elgar.

Lazer, D. (2008, August 19). *Complexity and Social Networks Blog.* Retrieved November 30, 2008, from Harvard University: http://www.iq.harvard.edu/blog/netgov/2008/08/network_panels_at_the_politica_lazer_fowler.html

Lazer, D., & Friedman, A. (2006). *The dark side of the small world: how efficient information diffusion drives out diversity and lowers collective problem solving ability.* Retrieved February 7, 2009, from Program on Networked Governance:
http://www.hks.harvard.edu/netgov/files/png_workingpaper_series/PNG06-001_WorkingPaper_LazerFriedman.pdf

Lundqvist, L. J. (2004). Management by objectives and results: a comparison of Dutch, Swedish and EU strategies for realising sustainable development. In W. M. Lafferty (Ed.), *Governance for Sustainable Development: The Challenge of Adapting Form to Function* (pp. 95-127). Cheltenhan, UK: Edward Elgar.

Meadowcroft, J. (2004). Participation and sustainable devleopment: modes of citizen, community and organisational involvement. In W. M. Lafferty (Ed.), *Governance for Sustainable Development: The Challenge of Adapting Form to Function* (pp. 162-190). Cheltenhan, UK: Edward Elgar.

Moore, J. (2004, January 1). *A Theoretical Note on Why Blogs Matter: The Strength of Weak Ties.* Retrieved February 8, 2009, from Jim Moore's Blog: Innovation, Strategy, Public Policy:
http://blogs.law.harvard.edu/jim/2004/01/01/a-theoretical-note-on-why-blogs-matter-the-strength-of-weak-ties/

Moore, J. F. (2005). *The Second Superpower Rears its Beautiful Head.* Retrieved February 8, 2009, from Extreme Democracy: http://extremedemocracy.com/chapters/Chapter%20Two-Moore.pdf

OECD. (2002, October). *Improving Policy Coherence and Integration for Sustainable Development: A Checklist.* Retrieved October 21, 2008, from OECD: http://www.oecd.org/dataoecd/61/19/2763153.pdf

O'Toole, L. J. (2004). Implementation Theory and the challenge of sustainable development: the transformative role of learning. In W. M. Lafferty (Ed.), *Governance for Sustainable Development: The Challenge of Adapting Form to Function* (pp. 32-60). Cheltenhan, UK: Edward Elgar.

Rammel, C., Hinterberger, F., & Bechtold, U. (2004). *Governing Sustainable Development: A co-evolutionary perspective on transitions and change.* GoSD.

RapLeaf. (2007, November 12). *Statistics on Google's OpenSocial Platform End Users and Facebook Users.* Retrieved February 12, 2009, from RapLeaf:
http://business.rapleaf.com/company_press_2007_11_12.html

Revolutions coloured green. (2008, November 20). Retrieved February 12, 2009, from The Economist:
http://www.economist.com/world/international/displaystory.cfm?story_id=12641740

Shirky, C. (2008, April 26). *Gin, Television, and Social Surplus*. Retrieved January 24, 2009, from Here Comes Everybody Blog: http://www.shirky.com/herecomeseverybody/2008/04/looking-for-the-mouse.html

Siebenhüner, B. (2005). The role of social learning on the road to sustainability. In U. Petschow, J. Rosenau, & E. U. von Weizsäcker (Eds.), *Governance and Sustainability: New Challenges for States, Companies and Civil Society* (pp. 86-99). Greenleaf Publishing.

Singh Grewal, D. (2008). *Network Power: The Social Dynamics of Globalization*. New Haven, CT: Yale University Press.

Social Network. (2008, November 21). Retrieved November 21, 2008, from Wikipedia: http://en.wikipedia.org/wiki/Social_network

Stelter, B. (2008, July 7). *Obama draws on social network of support*. Retrieved January 12, 2009, from International Herald Tribune: http://www.iht.com/articles/2008/07/06/business/hughes07.php

Stoker, G. (2006, October). *Local Governance Research: Paradigms, Theories and Implications. Lecture prepared for presentation at Zhejiang University, October 2006*. Retrieved February 9, 2009, from Institute for Political and Economic Governance (IPEG): http://www.ipeg.org.uk/papers/loc_gov_res.pdf?PHPSESSID=4cc81d2e0103da0bcb2af554fc09494c

Stroehlein, A. (2009, February 12). *Changing media habits for NGOs*. Retrieved February 12, 2009, from Reuters AlertNet: http://www.alertnet.org/db/blogs/3159/2009/01/12-110223-1.htm

Sustainability: Importance of social networks in the decision-making process. (n.d.). Retrieved from MULINO: http://siti.feem.it/mulino/dissem/intcon/lourenc.pdf

Sutton, R. (1999). *The Policy Process: An Overview*. Retrieved February 9, 2009, from Overseas Development Institute: http://www.odi.org.uk/publications/wp118.pdf

Technorati. (2008). *State of the Blogosphere 2008*. Retrieved January 3, 2009, from Technorati: http://technorati.com/blogging/state-of-the-blogosphere/

Tossel, I. (2009, January 30). *Open-source politics breathe fresh air into the Big Smoke*. Retrieved February 8, 2009, from Globe and Mail: http://www.theglobeandmail.com/servlet/story/RTGAM.20090130.wgtchange31/BNStory/Technology/home

Voß, J.-P., & Kemp, R. (2006). Sustainability and Reflexive Governance: An Introduction. In J.-P. Voß, D. Bauknecht, & R. Kemp (Eds.), *Reflexive Governance For Sustainable Development* (pp. 3-28). Cheltanhan, UK: Edward Elgar.

Voß, J.-P., Newig, J., Kastens, B., Monstadt, J., & Nölting, B. (2006, January 22). *Steering for Sustainable Development: A typology of empirical contexts and theories based on ambivalence, uncertainty and distributed power.* Retrieved October 22, 2008, from Sozial-ökologischen Forschung (SÖF): http://www.sozial-oekologische forschung.org/_media/Voss_Newig_Kastens_Monstadt_Noelting_060316.pdf

Web 2.0. (2009, January 3). Retrieved January 3, 2009, from Wikipedia: http://en.wikipedia.org/wiki/Web_2.0

Appendix 1: Highest Ranking Social Network for Each Country by Traffic (Source: Alexa.com, 16 November 2008)

Social Networking and Governance for Sustainable Development