INDICATOR 38 – COMMUNITY RESILIENCE

LITERATURE AND PRACTICE REVIEW

Submitted to the U.S. Roundtable on Sustainable Forests

by

Kristen Magis, Ph.D.

Leadership Institute
and
Portland State University

8/27/2007

TABLE OF CONTENTS

INTRODUCTION

Resilience of Forest Dependent Communities is a new indicator[1] incorporated into the Montreal Process Criteria and Indicators (MPCI) during the recent renegotiations of the Santiago Agreement. It, henceforth, is referred to as *Community Resilience*. Community resilience is defined herein as the existence, development and engagement of community resources to thrive in a dynamic environment characterized by change, uncertainty, unpredictability and surprise. Resilient communities intentionally develop personal and collective capacity to respond to and influence change, to sustain and renew the community and to develop new trajectories for the community's future.

The purpose of this Literature and Practice Review is to catalyze a conversation within the Roundtable regarding the development of a measurement protocol for Community Resilience. The Literature and Practice Review is part of a larger project initiated by the Forest Service to develop a measurement protocol for the new indicator. To accomplish that purpose, the information gleaned from the Roundtable discussion will be integrated with that generated from the Literature and Practice Review. Both will be analyzed by the Community Resilience Workgroup to generate the measurement protocol.

The Literature and Practice Review explores the history and context for Community Resilience both generally and within the context of the Montreal Process Criteria and Indicators. Terms essential to the community resilience construct are examined. Issues critical to the design of an associated measurement protocol are explored. Community capitals are introduced as the framework for the development of the community resilience measurement protocol. A number of on-the-ground applications and research projects on community resilience are presented. The Discussion and Conclusions section describes the path forward based on the findings of the literature review and the research/application projects. Finally, questions which the Indicator 38 Workgroup would like the Roundtable participants to consider are presented.

HISTORY OF COMMUNITY RESILIENCE

Throughout the summer of 2005, the Roundtable on Sustainable Forests hosted a series of workshops dedicated to the review and refinement of the Montreal Process Criteria and Indicators (C&I). This review marked the 10-year anniversary of the Santiago Declaration and the associated agreement to refine the criteria and indicators based on lessons gleaned from a decade of experience and research. As part of the review process, groups of social scientists gathered to discuss the social component of sustainability and the associated Montreal Process C&I. One of the recommended refinements to the Montreal Process C&I was the creation an index of *Community Resilience*. The index would be included in the sub-criteria, *Community Well-Being*. The social scientists offered the following rationale for this recommendation.

> Change is inherent within both forests and communities. The drivers of change in forest-based communities include a mix of internal and external factors, e.g. social, cultural, economic, political, technological, and environmental. Resilient communities are able to respond and adapt to change in ways that allow them to contribute to forest sustainability. Information collected on community resiliency can be utilized by the

---

[1] Criteria 6, Indicator 38

forest sector and communities to collaboratively determine their respective relationships in sustaining forests and community well-being.

The scientists, additionally, discussed a recommended approach to measurement, as well as a number of specific measures. Their overriding presumption was that Community Resilience is best measured via the construct of *community capitals,* specifically resources or assets available within the community. These include social, cultural, human, financial, political and built capitals.

Roundtable participants were unfamiliar with the concepts, but agreed that the current social C&I were insufficient. They recommended that a concerted study of social sustainability be initiated. In November, 2005 the Roundtable hosted a phone conference with experts in social sustainability and community indicators. Posed with the question of how best to initiate the study of social sustainability, the panel agreed that it would be wise to start by learning how communities approach the issue. Accordingly, the group advised that a project be undertaken to survey community indicator projects and to compare their efforts to those of the Montreal Process C&I. These findings could then be applied to forest-based communities and the Montreal Process C&I.

Hence, the Community Indicator project was initiated to learn the kinds of social issues communities consider of import to track via a community indicator process, and to compare the Montreal Process C&I to these efforts, specifically with regard to Community Resilience. The final report from the project (2005) is available at http://www.sustainableforests.net/. The following excerpt provides additional information on the construct of community resilience.

'A resilient community is one that takes intentional action to enhance the personal and collective capacity of its citizens and institutions to respond to, and influence the course of social and economic change' (Centre for Community Enterprise, 2000). Communities are subject to constant change from internal sources, e.g., the changing structure and capacity of its populace, as well as external sources, e.g., market, technological and environmental pressures. A community's resilience will determine its ability to successfully mobilize and respond to societal stress (Doak & Kusel, 1996; Harris, McLaughlin & Brown, 1998; Shinn, 1999). Hence, community resilience is integrally related to community and social sustainability (Beckley, 1995, 2000).

Community resilience is predicated on five constituents of community. First, social infrastructure such as associations, clubs and churches must be in place to provide community space in which to gather, learn and collaborate. Second, the community needs sufficient physical infrastructures, e.g., roads, utilities, schools, as well as the financial resources for community purposes. Third, the community needs collective knowledge, skills and abilities to anticipate and respond to change. Fourth, community members need be actively engaged in problem resolution and accomplishment of community objectives. Fifth, the community needs to reflect and honor the unique and diverse cultural traditions of its people. An index of Community Resilience, then, includes five associated types of community capital: social, physical/financial, human, political and cultural.

Information collected on the Community Resilience Index will provide an overview of the community's capacity to respond to internal and external stress and change, maintain and improve their social well-being and advance forest conservation and sustainable management. Further, as resilience is dynamic and malleable, the information can be

used by communities to strengthen their resilience (Centre for Community Enterprise, 2000; Haynes, 2003). Finally, the information will be vital to the forest service to discern how to best implement change in forest policy that will affect communities, and to monitor the impact of those changes on the community, both of which are required under the Healthy Forest Restoration Act.

In 2006 and 2007, international negotiators considered the recommendations of the technical review teams from various countries. Indicator 38, the Resilience of Forest-Dependent Communities was accepted as one of the official changes in the Montreal Process Criteria and Indicators. In 2007, the U.S. Roundtable on Sustainable Forests embarked on a year-long endeavor to develop a measurement protocol for this new indicator. Community Resilience is a brand new construct within the MPCI. Hence, the Roundtable chose to initiate its development with the establishment of a workgroup, a literature review specific to the topic and a review of relevant research and practice. The products of this initial research will be shared at the September, 2007 Roundtable meeting to engage participants in a conversation regarding the construct and its development into a measurement protocol. Based on the findings of the initial research and the Roundtable contributions, a measurement protocol will be designed by the Community Resilience workgroup.

This literature review starts with definitions of some key terms. It then describes the evolution of the community resilience construct within the forestry community. Community capitals, and specifically social capital, are then introduced. Then, findings related to the issues of scale, knowledge systems and measurement are presented. Next, a number of projects to research and implement constructs associated with community resilience are previewed. Finally, key points from the review are synthesized to generate the first premises upon which the Community Resilience measurement protocol will be developed.

DEFINITION OF KEY TERMS

This literature review included examination of Community Resilience in various disciplines, including Mental Health, Public Health, Disaster Response, Community Development, Natural Resource Management and Social-Ecological Systems studies. The study of Social-Ecological Systems is actually part of the Natural Resources field. However, as it contributes a unique and important perspective to this analysis, it is presented separately from Natural Resources. In this initial section, the discipline from which each citation emerges is reflected either in the content of the discussion or in footnotes to illustrate the diversity of fields in which this construct is being researched.

COMMUNITY

Communities are described in both the community development and natural resources literature. Excerpts from both fields are presented followed by the definition that will be used for the Community Resilience measurement protocol.

Communities, as defined by Gusfield (1975)[2], include both a territorial and a relational component. The territorial component refers to the specific geographical locale and the institutions specific to that locale, e.g., government and laws, schools, churches, families. The

---

[2] Community Development

relational component refers to relationships between people who live in the locale, including shared beliefs and interests, and a sense of belonging.

Chaskin, Brown, Venkatesh and Vidal (2001)[3] use a similar typology, referring to the geographical area and social attributes that define a community. The geographical area is characterized by natural boundaries, a particular history, specific demographic patterns and the presence of particular industries and organizations. The social attributes include language, customs, class and/or ethnicity. Flora (nd-a)[4] adds that communities have collective resources for the mutual support of community members.

Carroll and Lee (1990)[5], however, assert that the boundaries of many towns are arbitrarily defined. Community, they argue, is more accurately defined by groups of people who share an attachment to each other, the land and their shared lives. For example, many rural communities, while unincorporated, are still communities (Donoghue & Sutton, 2006).

Chaskin (2001) notes that community is exemplified by a set of characteristics, and operates through the agency of people to accomplish specific purposes. Community characteristics include a sense of community, a level of commitment among community members, the ability to solve problems, and access to resources. Social agency is embedded in individuals, organizations, and networks. Importantly, he notes that the social agency needs be directed toward shared community objectives.

Kusel (1996)[6] adds two notes that are important for this study. First, he defines forest-dependent communities as those immediately adjacent to forestland or that are dependent on forest-based industries, e.g., tourism and timber. Second, he refers to the nested nature of communities, existing as part of larger society. The linkages that communities have to larger society affect the opportunities available to them and the pressures placed on them.

A final, but important dimension, is the existence of external conditions, e.g., political, social, ecological and cultural, in the larger society within which the community is nested (Chaskin, 2001; S. F. Jackson et al., 1997; Kusel & Fortmann, 1991)[7]. These conditions provide opportunities for, and introduce constraints on, community capacity (Gibbon, Labonte, & Laverack, 2002). Communities are profoundly affected by these forces and often have little control over them.

Community is defined herein as a social grouping of people residing in a specific geographic territory. The community has a particular history, specific demographic patterns and contains houses industries and organizations. Community members establish patterns of interaction for multiple purposes, e.g., political, economic and social, and can mobilize community resources to take collective action for the benefit of individuals and/or the community. While towns are typical communities, rural communities can extend beyond the city limits or may be unincorporated and larger cities may be comprised of several smaller communities, i.e., neighborhoods. Forest communities are those that are adjacent to forests or are dependent on forest-based industries.

---

[3] Community Development
[4] Community Development
[5] Natural Resources
[6] Natural Resources
[7] Natural Resources

The constructs of community resilience and community capacity are highly related and sometimes used interchangeably in the literature. Hence, both are described and then a definition of community resilience is offered.

The Centre for Community Enterprise (2000) defines community resilience, 'a resilient community is one that takes intentional action to enhance the personal and collective capacity of its citizens and institutions to respond to, and influence the course of social and economic change'. Gunderson and Holling (2002) indicate that resilience is persistence borne out of change and adaptive renewal cycles. Berkes and Seixas (2005) concur with Gunderson and Holling, further stipulating that factors related to resilience include: 'learning to live with change and uncertainty; nurturing diversity for reorganization and renewal; combining different kinds of knowledge; and creating opportunity for self-organization' (p. 1).

Community Resilience is portrayed in the literature as multi-dimensional and dynamic. Dimensions include the kinds of system disruptions that activate community resilience, community responses to the disruptions, capacity development, the relation between risk and resiliency factors, and system renewal and new trajectories.

System Disruptions - Adversity, risk and change

Common to definitions across disciplines is the interjection into a system, i.e., community, of a disruption. In Public Health and Crisis Management, the disruptions are referred to as stressors, adversities or risks and can take physiological, psychosocial, socio-cultural and environmental forms. These conditions increase the likelihood of violence and injuries (Ahmed, Seedat, van Niekerk, & Bulbulia, 2004). In Natural Resources, adversity and change are the disruptors and community resilience refers to both individual and community capacity to respond to that change (Healy, Hampshire, & Ayres, 2003).

Community Response – Prevent, adapt, recover, thrive, influence

A resilient community responds in multiple ways to adversity, risk and change. Prevention of adversity, minimizing risk and promoting safety are critical in the Public Health field (Ahmed et al., 2004). Endeavoring to influence social and economic change is emphasized in Community Development (Colussi, 2000). Mitigating the impacts of change through adaptation is stressed in Natural Resources (Harris, McLaughlin, Brown, & Becker, 2000). Recovery from adversity is mentioned in Public Health (Ahmed et al., 2004). And, coping, adapting and shaping change are all addressed in Social-Ecological Systems (Berkes, Colding, & Folke, 2003; Smit & Wandel, 2006).

Capacity Development

Resilient communities, however, don't simply respond to disruptions. They work intentionally to enhance personal and collective capacity to respond to and influence change (Colussi, 2000)[8]. Berkes and Seixas (2005)[9] stress the capacity building element of resilience. Communities, they assert, need learn to live with change and uncertainty, and actively build the capacity to thrive in

---

[8] Community Development
[9] Social-Ecological Systems

that context. Costello and Johns (2006)[10] note that resilient communities develop capacity through their responses to crises. Those responses strengthen community bonds and resources and develop the communities' capacity, even as they address the presenting disruption (Chenoweth & Stehlik cited in Healy et al., 2003)[11].

Dynamic Interaction between Risk and Resilience Factors

In Public Health, risk and resilience are seen as related and interactive. Adversity creates vulnerability in the community, exposing it to potentially harmful affects. When faced with adversity, resilient communities develop material, physical, socio-political, socio-cultural and psychological resources to cope (Ahmed et al., 2004). The response is twofold. First, communities seek to limit risk factors, which reduces threats to health and safety. Second, they endeavor to increase resilience factors which can counteract risk factors. Communities that can limit risk factors and increase resilience factors develop the ability to not only survive disruptions, but to thrive in and through adversity (Davis, Cook, & Cohen, 2005).

Sustaining and Developing Systems

The study of Social-Ecological Systems adds another important dimension to community resilience. Resilience includes both sustenance and renewal. The community seeks to sustain itself in the face of change. It also, however, renews itself and develops new trajectories for its development (Smit & Wandel, 2006). Berkes and Seixas (2005) note that at certain thresholds, disruptions in a system [community] cause the system to change from one state to another. This dimension has several important implications.

First, stasis is not the goal, but rather persistence developed through the adaptive renewal cycle stimulated by change (Gunderson & Holling, 2002). Second, community resilience requires the ability to self-organize, experiment and learn. Third, developing resilience increases the community's ability to develop in dynamic environments which are characterized by unpredictability and surprises (Adger, Hughes, Folk, Carpenter, & Rockstron, 2005; Walker, Holling, Carpenter, & Kinzig, 2004). And fourth, community resilience is dynamic. A community has varying degrees of resilience that change over time depending on the conditions within the community, the external factors that influence it, and its capacity to respond and develop (Harris et al., 2000).

COMMUNITY CAPACITY

Community capacity is a construct closely related to community resilience. Community capacity, as described in Community Development and Natural Resource literature, is defined by the community's collective ability or capacity to address a variety of circumstances through use of various community assets or endowments, and to engage in collective action.

Kretzmann and McKnight (1993)[12] focus on assets, defining community capacity as a set of assets that exist within and among a community's members, local associations and institutions. Fawcett et al (1995)[13] focus on collective action, defining community capacity as the community's ability to pursue its chosen purposes and course of action.

---

[10] Mental Health
[11] Mental Health
[12] Community Development
[13] Community Development

Kusel (1996)[14] combines the existence of assets with the employment of those assets to meet community needs, respond to stressors, and create and exploit opportunities. The capacity, he states, can be activated to adapt and respond to various circumstances. Doaks and Kusel (1996)[15] add that capacity also nurtures a community environment wherein residents are able to identify their needs and goals.

Chaskin (2001)[16] summarizes the literature with this definition, "Community capacity is the interaction of human capital, organizational resources, and social capital existing within a given community that can be leveraged to solve collective problems and improve or maintain the well-being of a given community" (pg. 7).

COMMUNITY RESILIENCE DEFINITION

Community resilience is the existence, development and engagement of community resources to thrive in a dynamic environment characterized by change, uncertainty, unpredictability and surprise. Resilient communities intentionally develop personal and collective capacity to respond to and influence change, to sustain and renew the community and to develop new trajectories for the communities' future.

THE EVOLUTION TO COMMUNITY RESILIENCE

The construct of community resilience has evolved in several fields. However, as it is used in this document in the context of forest sustainability, its evolution in the natural resource field is the focus.

THE GROWTH FROM COMMUNITY STABILITY

Community Stability is based on the presumption that community well-being in forest dependent communities is provided through stable employment in the forestry sector and with consistent flows of timber products from forest lands (Donoghue & Sturtevant, 2007). Four related strands of thought, however, have challenged this presumption and led to a different paradigm.

CHANGE, THE CONSTANT

First, the construct of community stability is challenged. Change, not stasis, is the constant. Harris et al (2000) note that society is in a constant state of change. Globalization, additionally, introduces changes from multiple levels and diverse sources which also impact local communities (Magis, 2007, in press). Finally, communities are dynamic (Chaskin et al., 2001). They are inhabited by successive waves of people, and are utilized for different purposes in different time periods. The levels and kinds of resources invested in them change, and their character changes. All of these factors create communities characterized by change and uncertainty, not stasis or stability. In fact, asserts Adger (2006), in communities that are vulnerable, even small disturbances can cause dramatic social consequences.

Hence, Folke, Colding and Berkes (2003) assert that communities need to accept the inevitability of change and adapt to live with uncertainty and surprise. A resilience perspective

---

[14] Natural Resources
[15] Natural Resources
[16] Community Development

shifts from attempts to control change in systems assumed to be stable, to managing the capacity of social–ecological systems to cope with, adapt to, and shape change (Berkes et al., 2003; Smit & Wandel, 2006).

THE MYTH OF CONSISTENT TIMBER FLOW

Second and relatedly, maintaining a consistent flow of timber isn't possible and can't guarantee community stability. Harris (2000) cites as evidence the volatility of markets in the extractive industries, changes in federal land management practices, actions of private companies, changes timber supply, changes in employment within extraction industries and in- and out-migration of people. Additionally, he states, resource extraction industries are no longer the economic linchpin of many rural communities. All these changes affect the physical, cultural, social, political, legal, economic and psychological dimensions of communities (Gramling & Freudenburg, 1992). Hence, many social scientists question the connection between the 'timber extraction' paradigm and community stability (Folke et al., 2003; Kusel, 1996; Lee, 1989; Schallau, 1990). Rather, studies have found that not only are communities complex, but that community well-being is multifaceted (borealforest.org, ; Donoghue & Sturtevant, 2007). Hence, communities must develop and utilize a wide range of skills and knowledge to enhance their well-being.

ECONOMICS AND COMMUNITY WELL-BEING

Third, a significant change has also occurred in the understanding of economics as they relate to communities, namely that a healthy economy is important to community well-being, but insufficient by itself (Fey, Bregendahl, & Flora, 2006). Rather, Daubon and Saunders (2002)[17] advocate that sustained community development is more about a continued civic process and the development of community capacity. These both lead to the capacity to concert, i.e., the ability to develop shared understanding and to plan together.[18] Moreover, the existence of jobs does indicate the quality of work or whether the community is economically stable, so it does not equate with community well-being (Daniels, 2004; Stedman, Parkins, & Beckley, 2004).

COMPLEX COMMUNITIES AND COMMUNITY/FOREST RELATIONSHIPS

Finally, the community stability construct oversimplifies the relationship between residents and forests as well as of communities themselves (Daniels, 2004; Doak & Kusel, 1996; C. Flora, nd-b; Force & Machlis, 1997; H.F. Kaufman & Kaufman, 1946; Kusel, 2001; Kusel & Fortmann, 1991). The relationship of communities to forests is much more complex than that represented by the timber extraction industry. Further, communities are complex economic and social systems. This complexity is ignored by the timber and jobs perspective associated with community stability (Daniels, 2004).

Hence, emphasizing or focusing exclusively on economic definitions of community resiliency obscures important social and cultural factors (Daniels, 2004; Machlis & Force, 1988) and results in a narrow definition of community dependence on natural resources (Harris et al., 2000). Further, an exclusive focus on forest extraction employment overlooks the impacts of change on different occupational groups (Carroll & Lee, 1990). Rather, social well-being and quality of life need also be examined to understand the resilience of communities. Daniels (2004) suggests that

---

[17] International Community Development
[18] Websters New World Dictionary, 2nd College Ed., NY: Prentice Hall, 1986

socio-economic measures need be combined with social variables to derive a more comprehensive representation of communities. He suggests the term socioeconomic resiliency to reflect the ability of communities to manage transitions in the face of change.

Therefore, social scientists emphasize the ability of communities to manage change, not to maintain the status quo (Donoghue & Sturtevant, 2007). Additionally, communities have a vital stake in the economic, social and environmental impacts of forest management, so need be recognized as key stakeholders and must participate in the resource management issues that affect them (borealforest.org). Interestingly, prior to the narrowing of the definition of community stability, social scientists were clearly advocating a multidimensional approach to communities and their well-being. Kaufman and Kaufman (1946), for example, advocated that community well-being included community organizing, strengthening households, incorporating religion into the life of residents and the community, and public participation in forest policy.

To summarize, internal and external change is a constant within communities, the timber extraction industry is unable to guarantee community well-being, and communities and their relationships to forests are complex. The Community Stability construct does not adequately represent these realities, nor does it provide a path forward in understand communities. However, local, state, and Federal governments have a responsibility to help minimize the negative effects of the changes, or at the least, to assist their citizens in preparing for those effects (Harris et al., 2000). So, a different paradigm is called for accompanied by measures that create a more accurate picture of community well-being.

COMMUNITY RESILIENCE AND COMMUNITY CAPACITY

These developments led to a search for more holistic accounts of communities as well as the exploration of community well-being, community resilience and community capacity. In the 1990s, three large scale ecosystem studies were implemented (E. J. Jackson, Lee, & Sommers, 2004). These included the Forest Ecosystem Management Assessment Team (FEMAT), the Sierra Nevada Ecosystem project (SNEP) and the Interior Columbia Basin Ecosystem Management Project (ICBEMP). FEMAT was initiated in response to significant controversy over federal lands in the Pacific Northwest. SNEP was implemented to discern how to sustain ecosystems while providing resources to communities. And IBEMP was commissioned to provide ecosystem-based management direction for federal lands (Donoghue & Sturtevant, 2007).

Their work transcended the paradigm of community stability, presuming that community well-being is a more complex and multi-faceted phenomenon. While all three focused on communities' ability to adapt to change, FEMAT and SNEP both examined community capacity while ICBEMP studied community resilience, thus dovetailing with work in other disciplines in relation to community well-being, as well as work within the Social-Ecological Studies.

Donoghue and Sturtevant (2007) reviewed the three large-scale ecosystem assessments. Their analysis revealed that the operationalization of community resilience and community capacity was significantly similar across the studies. They all assign active agency to communities -- they are active participants in the communities' response to change and in the creation of their futures. They focus on adaptation to change. They assert that increased capacity or resiliency is related to the communities' increased ability to meet needs and adapt to change. They use multidimensional measurement constructs, including human, social and physical capitals. They

assert the centrality of social capital. And, they require utilization of qualitative data rather than socioeconomic data. And

Capacity, asserts Kusel (1996), is dependent on various forms of community capital. Community capital refers to the resources held by the community. Physical capital includes infrastructure, e.g., roads and buildings, and financial capital. Human capital refers to the skills, education and abilities of community residents. Social capital refers to the ability and willingness of residents to work collaboratively for the common good.

The Forest Ecosystem Management Assessment Team (1993) also utilized community capitals to measure community capacity as part of a large-scale ecosystem assessment. They utilized: physical capital, i.e., community infrastructure and economic resources; human capital, i.e., skills, education, experience; and social capital, i.e., ability and willingness to work together for community goals.

The notion of social capital is referenced repeatedly in Community Development literature, which emphasizes the ability and willingness of community members to participate in actions directed to community interests (Davis Smith, 1998; J. Field & Hedges, 1984; Home Office, 1999), and the processes of engagement, i.e., individuals acting alone and in community organizations, groups and networks to assist the community (Williams, 2004).

CHOOSING COMMUNITY RESILIENCE

The social scientists involved in the MPCI technical review meetings recommended community resilience instead of community capacity. While both are quite similar, are operationalized similarly and are analyzed in similar fashion, community resilience focuses specifically on community capacity with regard to change, while community capacity focuses on capacity in general. As forest communities are directly affected by changes within the forest, the social scientists felt the indicator needed to focus specifically on community capacity as it related to change. Hence, community resilience was selected as the new indicator to recommend for addition to the Montreal Process Criteria and Indicator suite.

SOCIAL-ECOLOGICAL RESILIENCE

Work in Social-Ecological studies parallels the work described thus far on resiliency. The Resilience Alliance[19] is a cross disciplinary group of researchers collaborating to explore the dynamics of social-ecological systems with resiliency as its prime research construct. Researchers in this network are making significant contributions to an integrated understanding of social-ecological systems. A few of these contributions are offered herein as they dovetail with the evolution to resiliency in the Montreal Process Criteria and Indicators.

Historically, natural resource management focused on controlling variability of resources, e.g., timber, through equilibrium centered, command-and-control strategies (Folke, 2006). The goal was to resist change so to maintain existing structures, i.e., remain robust (Anderies, Janssen, & Ostrom, 2004). Resiliency was defined as the system's capacity to absorb disturbance and re-organize in order to retain essentially the same function, structure, identity and feedbacks (Walker et al., 2004). As applied within the social sciences, the concept referenced the ability of communities to withstand disturbances so to maintain their social infrastructures (Adger, 2000).

---

[19] www.resalliance.org

This account, however, only addresses one part of resiliency. In fact, systems will absorb disturbances and retain their original structures and processes. However, there are thresholds at which systems undergo significant transformations to adapt to changing circumstances. This transformation is healthy and necessary for the system's continued survival. So, the first important contribution offered is that disturbances create opportunities for systems, i.e., communities, to develop and recombine structures and processes, thus renewing them and allowing for emergent phenomena. Resilience, states Smit and Wandel (2006), generates adaptive capacity to both sustain and develop in response to disturbance and change. The most appropriate response to disruption within communities will sometimes be maintenance and sometimes be transformation.

The second contribution has to do with the integrated nature of social and ecological systems. Smit and Wandel (2006) note that, if the results of a community's actions are only evaluated from a social science perspective, the conclusions may be erroneous. In fact, human societies are intimately interconnected with the ecological system (Gunderson & Pritchard, 2002), so the success or failure of their endeavors needs be evaluated from an ecological perspective as well as a social perspective. The same imbalance occurs when ecological systems are considered without attention to their linked social systems.

Third, diversity, or requisite variety, is essential for resilience. The principle of requisite variety states that systems need to encourage internal variety in order to survive. In fact, the more diverse and complex the system, the better it is prepared to cope with external disturbance (Morgan, 1997) as well as uncertainty and surprise (Perrings, Ma¨ler, Folke, Jansson, & Holling, 1995). Hence, developing diverse networks and weak links across networks is critical for community resiliency.

Fourth, resilience recognizes the significant local and traditional knowledge, experience and understanding carried by community residents (Berkes, Colding, & Folke, 2000), recognizes the key role that they play (Gunderson et al., 1995), advises their inclusion in management institutions, and suggests the complementarity of their contributions to conventional management (Folke and others 2003).

COMMUNITY CAPITALS

Community capitals are the assets or resources that exist within and are invested in the community. They include natural, cultural, human, social, political, financial and built capitals (Emery & Flora, 2006; C. Flora, Emery, Fey, & Bregendahl, nd; C. Flora & Fora, 2004).

COMMUNITY CAPITALS FRAMEWORK

The Community Capitals Framework (C. Flora, Bregendahl, Fey, Chen, & Friel, 2004; C. Flora & Fora, 2004) presents the most comprehensive description of community capitals. The descriptions provided herein are drawn primarily from Emery and Flora (2006). The framework includes seven capitals, natural, cultural, human, social, political, financial and built.

Natural capital refers to the weather, geography, natural resources, amenities, etc. of the particular location in which the community resides (Constanza et al., 1997; J. N. Pretty, 1998). Natural capital effects human, social, cultural and financial capital (Force & Machlis, 1997).

Cultural capital reflects the way that people 'know the world'. It includes values and is represented by symbols in language, art and customs (C. Flora & Fora, 2004). Culture creates the perspective from which people perceive life events and sets in motion social rules related to power and influence in the community (Bebbington, 1999; Bourdieu, 1999; C. Flora & Fora, 2004).

Human capital refers to individual capacity, training, skills and knowledge. Emery and Flora (2006) also include health and leadership. Leadership is mentioned frequently in community development literature and is seen as an important form of human capital. Leaders initiate, facilitate and direct community development activities, advocate for community interests and catalyze formation of groups and organizations to collaborate toward community objectives (Laverack, 2001). Importantly, human capital is utilized to develop and access resources and to develop the community (Chaskin et al., 2001; C. Flora & Fora, 2004; Harris et al., 2000). Finally, it increases the efficiency of financial and built capital.

Social capital is most frequently described as the collective norms and networks of reciprocity and mutual trust that contribute to working collaboratively for mutual benefit (Putnam, 2000). Relationships between individuals, informal groups and organizations provide the context of trust and support that enable people to collaborate toward shared ends. Bonding social capital is the close ties within groups that build cohesion. Bridging social capital is the loose ties between groups (Granovetter, 1973, , 1985).

Political capital is the community's ability to access resources, power and power brokers, as well as to impact the rules and regulations that affect it (Fey et al., 2006; C. Flora & Fora, 2004). It reflects the capacity of people to express themselves and to participate as agents in their community (Aigner, Flora, & Hernandez, 2001). Power relationships generate strong influences at many levels and deeply effect daily social interactions (Chaskin et al., 2001). Economic and social capital yields political capital. Political capital, importantly connects community development with government resources and private investment (Turner, 1999).

Financial capital refers to the financial resources available to be invested in the community for business development, civic and social enterprise and wealth accumulation (Lorenz, 1999). It measures the current financial situation, evaluates how communities utilize external resources, and makes future projections (Fey et al., 2006).

Built capital is the community's infrastructure, or as Flora and Flora (2004) state, financial capital transformed into built capital. It includes machinery, homes, office buildings, schools, roads, sewers, factories and water systems.

The community capital construct is prevalent in recent ecosystem studies, as well as general community studies and rural community development. Donoghue and Sturtevant (2007) upon review of the three large-scale ecosystem assessments -- the Forest Ecosystem Management Assessment Team, the Sierra Nevada Ecosystem project and the Interior Columbia Basin Ecosystem Management Project -- noted that the operationalization of community resilience and community capacity utilized the community capitals construct.

In the area of community development, Laverack (2001) lists domains critical to community development. These domains all fit within the community capitals. Domains that fit within social capital include: participation to define, analyze and act on issues of general concern to community; organizational structures that facilitate people gathering in order to address concerns

and problems; community identification of problems, solutions and actions and a sense of self-determination and capacity; links across organizations and groups; and links between communities and external resources. The leadership domain fits under human capital. And, resource mobilization fits under financial capital.

Also in community development, Chaskin et al (2001) describe characteristics of community capacity. A sense of community is described as the degree of connectedness among community members as well as collectively held values, norms and visions. This clearly fits under social capital. Commitment to community is defined as the responsibility that members feel toward the community, as well as their active participation in community objectives. This also fits under social capital. The ability to solve problems relates to human capital. Access to resources references economic, human, physical and political resources, both within and beyond the community. It further references the ability to make links with external resources. This fits under several of the community capitals, i.e., social, financial, human and political.

FINDINGS REGARDING COMMUNITY CAPITAL

➢ Communities have different kinds and amounts of capitals (Fey et al., 2006). That differentiation corresponds with patterns of residential segregation by race and class across communities (Chaskin et al., 2001).

➢ Communities have the ability to develop resiliency (Ahmed et al., 2004).

➢ Community structures and leadership develop in the absence of formalized social support structures. They are utilized more when social supports are absent or under-utilized (Ahmed et al., 2004).

➢ Poor communities, populated by people from minorities, have identifiable assets. These communities tend to engage more with local resources, e.g., volunteers, organizations, than may more affluent communities (Chaskin et al., 2001).

➢ While affluent individuals have greater personal resources, those resources only contribute to community capacity if they are dedicated to collective action focused on the community (Chaskin et al., 2001; Donoghue & Sturtevant, 2007; Emery & Flora, 2006). Hence, even if many wealthy individuals may live in the community, the community can not be presumed to have strong community capacity(C. Flora et al., 2004).

➢ Social capital can trump the disadvantages of social class and weak cultural capital (Coleman, 1988-9; Lauglo, 2000).

➢ *Foundational capitals* are those resources that are present in the community. They include physical, natural and economic capitals. *Mobilizing capitals* activate and mobilize foundational capitals into productive use by the community. Mobilizing capitals include human, social and political capitals (Donoghue & Sturtevant, 2007; Emery & Flora, 2006).

➢ The capitals are interrelated (Ahmed et al., 2004; C. Flora, nd-a). Use of one will create new capitals and increase the productivity of other capitals. Capitals left unused can decrease. Overemphasizing one can effect a reduction in others and can result in eventual decline in community well-being despite short-term gains (C. Flora, nd-a).

➢ Capitals can be transformed from one form to another (Fey et al., 2006), e.g. financial to built or human to social. The connection between human and social capital is described as one of

the most robust empirical regularities in the social capital literature (Glaeser, Laibson, & Sacerdote, 2002).

SOCIAL CAPITAL

Social capital is distinguished among the capitals. Harris et al (2000) emphasize that a decisive and major determinant of community resilience is its residents. Of particular import, he notes, is the willingness of residents to assume leadership and organize to realize their community's potential. Laverack (2001)[20] lists a number of characteristics of community capacity, including: resident participation in identification, analysis and management of community issues; organizational structures which facilitate community gathering, interaction and problem solution; multiple links across people and organizations, and; links between the community and external resources. All these characteristics relate to social capital.

Simply put, social capital can be seen as the norms and networks that facilitate collective action (Savage, Isham, & McGrory Klyza, 2005). Field (2004) notes that people tend to connect with those sharing similar values through a series of networks. To the extent these networks constitute resources for its members, Field (2004) asserts they have a form of social capital. Emery and Flora (2006) concur, stating that social capital reflects the connections between people and the social adhesive to activate action.

Both Kaufman (1959) and Wilkinson (1991), however are careful to point out the distinction between development *within* the community and development *of* the community. Wilkinson differentiates between *social fields* and *community fields*. A social field develops when actions take place within a particular sector. For example, a social field is developed when a group of affluent persons pool resources to purchase exclusive services for their neighborhood.

A community field develops when people take collective action to address a community-wide issue. Of import is the fact that developing strong social fields within a community does not necessarily generate a strong community field. For example, the social field developed the affluent group, if not shared across the community, does not result in a community field. The community field can only be developed through collective community action toward a shared community goal, e.g., if community resources are shared to develop a public good, available to all.

THE MAKING OF SOCIAL CAPITAL

Emile Durkheim (1958), observing nineteenth century capitalism and urbanization, noted that people were moving from close knit communities that were strictly regulated by rules of feudalism into a loose knit world of strangers. The drastic change in social order led him to question how people were able to manage their affairs. What he witnessed was people developing many different connections through which they interacted for varying purposes. These loose ties served to connect people into smaller units as well as into the larger society.

Bourdieu took up the question of the capitals, stating that "Social capital is the sum of resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu, 1999, p. 119). He asserted that social networks were invaluable as a basis

---

[20] Community Development

for social cohesion as they create spaces wherein people can gather, find common ground and take collective action to accomplish their purposes.

Bourdieu's interest in social capital emerged from his concern with social hierarchies and the reproduction of inequality. Understanding these social structures requires understanding capital in all its forms, not just that supported by economic theory (Bourdieu, 1999). While Bourdieu, however, was concerned that social capital was solely a resource for the wealthy and powerful, Coleman (1988-9) asserted the contrary. He believed that social capital could convey benefits to poor and marginalized communities. The strength of social capital lay in its twin characteristics of reciprocity between people and networking between groups imbued with and governed by high degrees of trust and shared values. Coleman found that, in fact, communities are a source of social capital, that social capital is not limited to wealthy and powerful communities, and that social capital can offset social and economic disadvantage (Coleman, 1988-9). However, while Coleman focuses on individuals pursuing their own interests, Schuller (2000), takes care to emphasize the collective. Social capital is about collective endeavors directed to a shared community goal.

As with Durkheim, de Tochqueville was curious to understand how social order developed within the new American society, free as it was of aristocratic bounds and operating in a fairly open manner. In his travels, he observed Americans engaging with one another across all facets of life to manage their lives and communities. He believed this network of loose associations provided the foundation out of which a democratic society grew. "In their political associations, the Americans, of all conditions, minds, and ages, daily acquire a general taste for association and grow accustomed to the use of it. There they meet together in large numbers, they converse, they listen to one another, and they are mutually stimulated to all sorts of undertakings. They afterwards transfer to civil life the notions they have thus acquired and make them subservient to a thousand purposes" (Tocqueville, 2001). Putnam followed de Tocqueville in his examination of social capital. He defined social capital as "…features of social life – networks, norms and trust – that enable participants to act together more effectively to pursue shared objectives." (Putnam, 1996, p. 56).

SOCIAL CAPITAL: STRUCTURE AND RELATIONSHIPS

'Social capital is a slippery but nonetheless important concept; slippery because it has been poorly defined, important because it refers to the basic raw material of civil society' (Onyx & Bullen, 2000)

Stone, Gray and Hughes (2003)[21], who examine social capital as it relates to labor markets, state that social capital includes both the structure of social relationships and the quality of those relationships. The structural features include the kind of group or network, its size, its ties, and its density. Density refers to the social ties within a network and the diversity of network members (Coleman, 1988-9). More specifically, density refers to the level and regularity of interaction among those members (Granovetter, 1973). Granovetter states that several factors combine to determine the strength of ties between people and within networks; amount of time, emotional intensity, intimacy and reciprocal services. Networks with strong ties are said to be dense, while those with weak ties are less dense.

---

[21] Community Development

In dense networks, all members know one another. In closed networks, all members have social relationships with one another. Both density and closure influence relationships within and beyond the network. They facilitate the development and enforcement of powerful group norms and sanctions which can be used to control and support members. This kind of social capital is typically referred to as bonding. Bonding social capital creates redundant ties that build community cohesion (Granovetter, 1973, , 1985), reinforces identities of individuals and the network, and maintains homogeneity within the network (Putnam, 2000).

However, dense networks and bonding can isolate the group and inhibit networking with other groups and networks. Granovetter (1973) describes a community organized into small, closed networks. Within the networks, there is a very high degree of connection between members. However, there are no connections from one network to the other, creating what Granovetter calls network fragmentation. The more network fragmentation, the fewer pathways a person has to travel between networks and the more isolated individual networks become. Now, the significance of Kaufman's (1959) and Wilkinson's (1991) claim becomes evident – development of individual social fields, i.e., networks, does not develop a community field. Rather, specific effort needs be made to develop a community field through community action.

Granovetter (1973) proceeded to describe weak ties as the causal or instrumental bonds which can connect individuals across organizations, networks and communities. These cross network ties expand the information, resources, influence and opportunities beyond that which any single network would have internally available. This is the second type of social capital – bridging social capital. Importantly, increasing heterogeneity and diversity within networks enhances people's abilities to cross networks, i.e., bridge (Narayan & Pritchett, 1999; Stanton-Salazar & Dornbusch, 1995; Woolcock, 2000).

The strength of bridging social capital is that it brings diverse and differently situated people together (Putnam, 2000). Diffusion of resources, ideas, etc. traverses greater social distances and effects a greater number of people (Granovetter, 1973). Ultimately, resource availability is expanded and people develop broader identities, which in turn facilitate additional bridging. Granovetter identified formal organizations and work settings as common sources of weak ties.

Closely associated with bridging social capital is the notion of linking social capital. Linking social capital focuses on vertical relationships between the network and those with power or authority (Narayan & Pritchett, 1999; Woolcock, 2000). As with bridging, linking requires heterogeneity of social ties to enable multiple linkages to multiples sites and people. Linking social capital is particularly important for communities poor in resources. The more they can link with sources of power and wealth, the greater their access to resources, the more opportunity they will have to make their voices heard and the better situated they will be to take advantage of opportunities. The challenge of weak ties is that they don't offer the high levels of trust characteristic of bonding social capital.

Both bridging and bonding social capital are necessary for resource mobilization, building inclusive and diverse networks, developing comprehensive problem statements, and enabling collective action (J. L. Flora, Sharp, Flora, & Newlon, 1997).

SCALE

The Millennium Ecosystem Assessment (2003) defines scale as the physical dimension of a phenomenon or process in space or time, expressed in physical units. A number of points related to scale are of particular interest for the Community Resilience indicator. While interrelated, the points are separate enough to merit a bulleted presentation.

➤ Units in a scale are nested, forming spatial hierarchies. Human activities are thus nested, with communities nested in counties, which are political subdivisions of the state, which in turn are included in regions (Force & Machlis, 1997). These divisions are often the result of decisions unrelated to natural ecosystem divisions.

CRITERIA FOR SCALE SELECTION

➤ Selecting the appropriate scale from which to measure Community Resilience is important. Each of the following points has implications for scale selection. The list can be utilized as criteria for scale selection.

  ❖ Scale is related to function and different functions have different scales (Wilbanks, 2006)

  ❖ Phenomena, processes and structures operate differently at different scales (Wilbanks, 2006)

  ❖ Different institutional roles, and thus different politics, are pertinent at different scales (Wilbanks, 2006)

  ❖ Watersheds, ecological provinces or regions, while important for ecosystem management, may not be appropriate for social assessments (Krannich, Carroll, Damiels, & Walker, 1994)

  ❖ Each scale utilizes different indicators and measurement protocols (Beckley, 1998; Wilbanks, 2006)

  ❖ Different stakeholders and issues of concern are manifest at different scales (Fabricius, Scholes, & Cundill, 2006)

  ❖ Studies at one scale may be of little use in understanding dynamics at other scales (Beckley, 1998)

  ❖ The meaning and utility of data depend on scale. Certain analyses lend themselves to certain data types (Beckley, 1998)

  ❖ A combination of qualitative and quantitative data are the most illuminating (Beckley, 1998)

  ❖ The dangers of allowing data availability and cost of collection to determine the data that is sought is that the data will not answer the questions asked, and will be misleading or erroneous (Beckley, 1998)

  ❖ Wright, Alward, Hoekstra, Tegler & Turner (2002) maintain that indicators developed for the national level don't address local level systems and questions. Moreover, while broad indicators, e.g., employment, can be applied at multiple levels, they have to be customized to each scale level in order to provide valuable information for that scale.

CHARACTERISTICS OF LOCAL SCALE

➢ Fabricius et al (2006) found that the kinds of information available varies at different scales. Information at a regional level tends to be formal and documented. Information at a local scale tends to be informal and undocumented. It is more likely to be based on the life experiences and folklore of local people, embedded in local customs and traditions, and transmitted orally.

➢ Information gathered at a local scale will reveal great variety, rich detail, and complex relationships about the specific locale. This is in part due to the fact that those with local knowledge and expertise can offer data not available in other formats. Conversely, information gathered at higher scales will necessarily lose valuable information particular to specific locales (Wilbanks, 2006).

➢ Local variance and complexity can challenge generalizations made at higher levels, resulting in greater understanding and more accurate depictions of the phenomena under study (Wilbanks, 2006).

➢ Care must be taken in generalizing local case studies to higher scales. First, the unique characteristics for which they were studied may vary too far from 'typical' cases. And second, those with local knowledge may lack understanding of forces and trends operating at higher scales. To increase the value of individual case studies for higher scale learning, chose cases for comparability, use a consistent study protocol and compare cases with control cases (Wilbanks, 2006).

➢ Clear identification of community boundaries is difficult and data availability within those boundaries is limited (Kusel, 1996).

COUNTY LEVEL

➢ Counties are the basic subdivision of states, devised for administrative and political purposes. As they are key units in the census, good quality secondary data is readily available and easily comparable to all counties across the U.S. (Force & Machlis, 1997).

➢ However, as they are political entities, they many times are not meaningful social groupings as they have nothing to do with socio-cultural, economic or resource issues (Harris et al., 2000). Relationships and community life transpires in communities, not counties (Kusel, 1996)

➢ County level data mask the unique circumstances of communities within its borders (Beckley, 1998; Harris et al., 2000). Kusel (1996) further elucidates this issue:

   ❖ Only some communities in a county are resource-dependent.

   ❖ County measures may have little relationship to resource activities.

   ❖ Understanding community well-being requires community specific information not available at the county level.

➢ Harp and Pauley (1993) provide an illustration of this issue. County level data showed a county with a diverse economic base. The assumption drawn from those data was that the communities were economically diverse. However, more detailed community analyses revealed that most communities relied on just one sector, making them particularly vulnerable to changes in commodity prices or resources. County-level data obscured these critical differences.

- Jackson, Lee and Sommers (2004) also found that data from secondary sources could not depict causal factors underlying social and economic change in rural communities. They found data to be severely limited and that aggregation obscured variation across communities.

COMMUNITY LEVEL

- Communities are the most appropriate unit of analysis for community issues (Beckley, 1998).

- Analyses of social networks within communities confirmed they are as important as political and economic ties (Harris et al., 2000).

- Communities are continually changing, so any portrayal of a community is a time-bound snapshot. Measurements must match the dynamic nature of communities, e.g., snapshots of recent past and current conditions (Harris et al., 2000).

- Social assessments must utilize an analytic framework that focuses on the community, first because of the connections between community resources, social organization and community well-being and second because communities play important roles as administrative and participatory units (Branch, Thompson, Creighton, & Hooper, 1982).

- Rural communities are very vulnerable to change so social assessments must occur at that level (Beckley, 1998).

- County-level activities and responses can be examined by aggregating community-level data. (Harris et al., 2000)

MULTI-SCALE MEASUREMENTS

Wilbanks (2006) recommends using multi-scale measures. Different kinds of information can be obtained at different scales. Utilizing them individually could lead to a narrow and incomplete portrayal of the situation. Combining them will lead to a more complete portrayal and additionally will show interrelationships that aren't visible from just one scale.

Beckley (1998) notes that detailed portraits can be created by utilizing different data from various levels. For the regional context, he recommends secondary and historical sources. To glean particular information about specific group, Brown (1995)recommends face-to-face interviews.

Kusel and Fortmann (1991) concur that multi-level analysis is beneficial but caution to draw conclusions regarding a specific level based only the data from that level.

KNOWLEDGE SYSTEMS

DEFINITIONS

Fabricius, Scholes and Cundill (2006) provide most of the material for this discussion of knowledge systems. They start with some definitions. Explicit knowledge is that which exists in written or categorical form. Tacit knowledge is that which is held in people's memories and is not documented. Formal knowledge is that which is passed through strict and universally accepted rules. Informal knowledge is subject to local rules of validity and is highly context specific.

Local knowledge is that which is embedded in local customs and belief systems.

1. It is mostly tacit and very seldom documented.

2. It is used primarily to assist people in a locale to address daily challenges, and to detect and respond to changes.

3. Quality and validity of knowledge is tested and refined through an adaptive process which includes hands-on experimentation and integration of knowledge into the social memory through folklore, societal norms and institutions (Berkes & Folke, 1998).

4. Institutions act as knowledge banks and mechanisms for knowledge transfer. They convert knowledge into sets of rules, norms and social behaviors. Those rules and norms then become integrated into the systems through which the community is managed (Folke, Berkes, & Colding, 1998).

INTEGRATING SCIENTIFIC AND LOCAL KNOWLEDGE

"In the past, indigenous knowledge was widely regarded among development professionals as an academic, if not dilettantish, concern limited largely to social anthropologists. Much of it was seen as superstition. In the dominant model of development, useful knowledge was only generated in central places -- in universities, on research stations, in laboratories, then to be transferred to ignorant peasants and other poor people" (Chambers & Richards, 1995, p. xiii).

Fabricius et al (2006) however, challenge that sentiment, noting shortcomings of Western scientific knowledge and highlighting strengths of local knowledge. Formal, scientific knowledge, they contend, has a tendency toward extreme compartmentalization and reductionism, and as a result struggles with integration. Scientific knowledge is held within a small domain of people and is largely incomprehensible to the general public and even to highly educated policy makers. Finally, the scientific approach 'struggles to engage usefully' with questions that are better answered through qualitative methods than through quantification and mathematical expression.

Local knowledge, Fabricius et al (2006) assert, offers important insights and contributions. First, local knowledge co-evolves with ecosystems. Ecosystems and local knowledge form a feedback system which results in adaptations of local customs, belief systems and day-to-day practices. Second, the local knowledge system is a rich repository of the locale's history, including ecosystem use and change, customs and politics. Third, local knowledge is a critical source of fine-grained and detailed information about the ecosystem. Fourth, solutions to environmental problems require broad, decentralized and integrated approaches that are sensitive to local cultural values and institutions (Berkes & Folke, 1998). Local knowledge is necessary to develop such approaches.

Fabricius et al (2006) identify limitations in local knowledge. First, the evolution of local knowledge can be outpaced by changes in social-ecological systems. Second, powerful external influences can override local knowledge causing it to evolve erroneously. And third, local knowledge can be too fine-grained and locale specific to identify changes that are occurring slowly or on a larger scale.

When integrating local knowledge, there are several questions that need be addressed. First, a determination needs be made regarding the relevancy of local knowledge outside the local context. Second, scaling up and generalizing local knowledge needs be approached carefully

(Lovell, Mandondo, & Moriarty, 2002). And third, care needs be taken that local knowledge systems aren't marginalized by the more dominant formal knowledge system.

A number of techniques have been utilized to access local knowledge. Borrini-Feyerabend (1997) used focus group workshops and interviews. Pretty, Guijt, Scoones and Thompson (1995) used semi-structured interviews with key informants. Chambers (1994) used participatory rural appraisal techniques. Alcorn (2000) used participatory mapping. And Burt and Copteros (2004) utilized forum theater.

Fabricius et al (2006) make recommendations to facilitate integration of local and scientific knowledge. First, ensure that both knowledge bases are translated and documented in ways that both groups can understand. Second, cross validate both knowledge forms, with local experts validating scientific knowledge and scientists validating local knowledge.

"It is now generally recognized that the chemical route to strengthening agriculture and health care has failed, and must be abandoned. This provides us with an opportunity to re-evaluate indigenous knowledge systems and to move away from the false hierarchy of knowledge systems back towards a plurality. The pluralistic approach to knowledge systems requires us to respect different such systems – to embrace their own logic and their own epistemological foundations… It also requires us to accept that *one* system (i.e., the Western system) need not and must not serve as the scientific benchmark for all systems, and that diverse systems need not be reduced to the language and logic of Western knowledge systems" (Shiva, 2000).

MEASUREMENT

DEFINITIONS

The following definitions of social indicators each make unique contributions to describing the construct. They address its purpose, its temporal nature and its integration into a theoretical framework.

The U.S. Department of Health (1969) focused on the purpose of social indicators, namely that they facilitate comprehensive and balanced judgments regarding societal issues of normative interest. If changes in the indicator move in the 'right' direction while other things remain equal, one can presume that things have gotten better.

Rossi and Gilmartin (1980) define social indicators as measures that allow the identification of long term trends, periodic changes and fluctuations in rates of change. They add that social indicators need be desegregated by relevant characteristics.

Finally, Force and Machlis (1997) define social indicators as integrated sets of measures organized around an explicit theoretical framework that provides the rationale for selecting individual indicators and their measures. They also noted the need to collect data repeatedly over time to allow for systematic comparison.

DIFFERENTIATING PERFORMANCE FROM RESULTS

Friedman (1997) provides clear, succinct definitions of important terms. *Indicator* is defined as a measure that helps to quantify the achievement of a desired result. It answers the question,

"How would we know a result if we achieved it?" *Result* is defined as an umbrella statement that captures the comprehensive set of needs that must be met in order to achieve success.

Performance measure, importantly, is differently defined. A performance measure is a measure of how well something is working, e.g., timeliness, cost-effectiveness or standard compliance. Performance measures examine responses to problems. Results are the conditions the responses are attempting to solve. The key distinction is between means and ends. Results and indicators have to do with ends. Performance measures have to do with means.

Input is defined as an action that should lead to a change, and *output* is defined as the result of the input. The goal is to shift the focus of measurement from quantity to quality, from input to output and from performance measures to results.

Footprint indicators are those indicators for which there is "hard data". *Perceptual indicators* are those indicators that measure people's attitudes and perceptions, and that require data collection.

CHALLENGES OF COLLECTING SOCIAL DATA

Collecting relevant, accurate and valuable social data is very difficult. To start, Odum (1936) clarifies what should and should not be expected from social indicators. He cautions that social indicators are merely social facts. If collected over time and compared to a baseline measurement, they can show trends in social conditions. They, however, can not explain the structural societal factors causing those changes.

Force and Machlis (1997) indicate that social indicators are reliant on data availability and accessibility. However, Jackson, Lee and Sommers (2004) contend that data availability is the single largest problem in social indicator research. The choice, they state, is between data at higher levels, e.g., county and state, or at lower levels, e.g., ZIP codes, places, census tracts. Data at higher levels is validated, stable and comprehensive, whereas data at lower levels is less reliable, inconsistent and idiosyncratic. However, while data at higher scales may be more stable, it obscures internal variation, a serious problem when the intent of the indicator is to understand resiliency at a community level. And, while data at lower scales is less reliable, it provides a more accurate depiction of local circumstances.

Several factors hinder the comparison across years. Data may not be available at useful scales or in appropriate time periods. Time series of data are often incomplete (E. J. Jackson et al., 2004). And, indicator definitions or data collection methods can be changed (Force & Machlis, 1997).

Jackson, Lee and Sommers (2004) cite additional problems with gathering secondary data on social indicators at sub county levels. The boundaries for which data is published are irregular. For example, employment data is based on counties, scholastic performance is based on school districts, and population and housing is based on various census areas. These different boundaries create different populations, so the measures are not comparable. Second, they cite the common tendency to select statistics and create proxies based on expediency and cost, which results in variables that are at best imprecisely related to the constructs they are supposed to represent.

Kusel (1996) provides an example with a typical socio-economic measure of well-being, i.e., real income. Real income, he contends, confuses well-being with material wealth. Real income indicates a person's consumption capacity, but does not reveal how her/his life was improved

through those purchases. It also doesn't reveal the distribution of resources within the community or the family. Finally, his research revealed that socio-economic measures bear little relationship to subjective measures of well-being.

<h2 style="text-align:center">TIDBITS</h2>

- Lewis and Lockhart (2002) note that trends over time should show a turn away from a negative baseline. Indicator baselines provide the comparison data to examine trends over time. Friedman (1997) states that baselines enable multi-year scans and avert oversimplifications that accompany year-to-year and point-to-point comparisons.

- Donoghue and Sturtevant (2007) state that measures need reflect multiple dimensions and their temporal aspect.

- Donoghue and Sturtevant (2007) also note that while single, combined scores are useful for statistical analyses, they obscure critical variation at the community level.

- Schwartz, Bridger and Hyman (2001) define key informants as individuals who can provide insights and access to information that are valuable to understand the community under study. Key informants' value lies in their knowledge, experience and social status in the community.

- Jackson et al (2004) propose longitudinal studies of communities. These need utilize case studies, surveys, focus groups and interviews as through that level of analysis, community variation can be understood. They recommend the survey method as the most efficacious choice for scaling up.

RESEARCH AND PRACTICE

A number of projects have been developed and implemented relating to the question of community resilience. These include research projects as well as projects to apply the constructs in praxis. In this section, the projects are briefly reviewed to illustrate the breadth and extent of work on community resilience and related issues. The findings from the projects provide the basis for the conclusions presented in the Discussion and Conclusions section.

Metrics utilized in these projects are presented in Attachment A. The Community Capitals Framework is presented first as it provides the foundation from which the Community Resilience measurement protocol will be developed. While all the other projects present unique and important dimensions, the metrics they utilize categorically align with the Community Capitals Framework. Attachment B organizes all the metrics from the following projects according to the CCF to illustrate the synthesizing and coordinating function which this construct provides.

THE COMMUNITY CAPITALS FRAMEWORK

The North Central Regional Center for Rural Development at Iowa State University, under the leadership of Dr. Cornelia Flora carries an active research agenda related to the Community Capital Framework (CCF). Flora et al (2004) explore the hypothesis that, 'balanced capital investments with appropriate attention to the mobilization of both internal and external capitals are associated with high levels of community economic development success' (pg. 4). Community resources or assets, when invested, become community capital which the community can then reinvest in a continual cycle of community development. The framework provided by

the community capitals enables the identification of the entire range of community assets. It further, provides a systematic, comprehensive structure with which to analyze the existence, interactions, change and development of community resources, and hence, to understand the resilience of communities.

Emery and Flora (2006) used the Community Capitals Framework (CCF) to analyze how community capitals were invested in a community development project, and the impacts made by those investments. The CCF analysis includes identification of capital assets, i.e., stocks, capital investments, i.e., flow, interactions among the capitals and the impacts across capitals. Data was collected via interviews with community leaders, archival sources such as websites and reports, and participant observation. Important findings regarding the capitals and community capacity include:

➢ Capacity is measured by increases in stocks of assets and by increases in flows of assets which build stock in other capitals.

➢ *Spiraling-up* is a process wherein assets gained increase the likelihood that other assets will also be gained (Gutierrez-Montes, 2005). Asset growth can become a self-reinforcing cycle of community development.

➢ The capitals are highly interrelated, with change in one often triggering changes in others. This interrelationship is exemplified in the case study. An investment in human and financial capital led to increases in human capital, transformation of cultural capital and development of political capital.

➢ An increase in specific assets might not have an impact on overall capacity (Gutierrez-Montes, 2005). For example, the infusion of financial capital or built capital often is not cumulative.

➢ Increases in the stocks and flows of social capital were found to best catalyze the development of additional capitals.

➢ Both human and social capitals develop in relation to specific goals.

Another study focused on 57 rural communities with populations less than 10,000 people in the United States, Australia, New Zealand and Canada (Fey et al., 2006; C. Flora et al., 2004). The study used the CCF to analyze community and economic development (CED) efforts. Data was gathered primarily through archival research, e.g., published case studies, news stories, newspaper articles, community websites and census data. One visit was made to each site, followed by phone and email communications with community leaders. The contributions this article makes to this literature review include its review of how the capitals are measured and how communities were then compared.

The authors note that it is more important to measure *how capital is invested*[22] than to simply identify its existence. This study looked at the context, processes, outcomes and outputs of CED interventions. It measured how capital changed over time. The authors indicate two challenges with measurement of capitals. First, there is overlap between different capitals. Second, anecdotal evidence is difficult to quantify and introduces the risk of bias or misrepresentation. The following indicates what was measured in each of the capitals:

---

[22] Italics added by author for emphasis

- Natural capital – the ability of the community to recover from the loss of a resource-based industry, improving natural capital, using natural capital to attract outsiders.

- Cultural capital - festivals, heritage events, preservation and invention of town traditions. These reveal a community's intent to share common traditions and heritages.

- Human capital – retention of youth and women in the community. Population statistics, job growth, education statistics, withdrawal of governmental services. These show the investment in human capital. Loss of human capital is also a loss of economic and social capital (Alston, 2004).

- Social capital – bonding, bridging and linking, formation of new groups and how those groups leveraged outside resources.

- Political capital – role of local, county and federal government in CED effort.

- Financial and built capital – current financial conditions as well as projected future outcomes, how communities use outside funding.

Community comparisons were completed. Information on each of the capitals was collected for each community. A single index score for each of the capitals was calculated by aggregating the scores for all communities for each capital. A 3-tiered ranking system was developed for each of the capitals. Then, communities were divided into three groups relative to each other for each capital, those with 'high', 'medium' and 'low' scores. This method adjusted for bias from the differing number of variables used for each capital.

A number was then assigned to each rank, high = 3, medium = 2, low = 1 so that total composite scores across the capitals could be calculated for each community. Total composite scores ranged from 7 to 16. These were divided into three ranks to reveal an overall capital outcome for each community. This method adjusted for bias introduced between communities when, for example, one community scores very high in one capital and not others.

SIERRA NEVADA WELL-BEING ASSESSMENT

Kusel (1996) and Doak (1996) conducted an assessment of community well-being in the Sierra Nevada. They defined community well-being as consisting of both factors of well-being and of community capacity, so utilized both socio-economic and community capacity measures. To create socially meaningful units of analysis and to avoid problems associated with county level analyses, they combined adjacent census block groups into larger units, or aggregations.

Community capacity was defined as 'the collective ability of residents in a community to respond to external and internal stresses; to create and take advantage of opportunities; and to meet the needs of residents, diversely defined' (p. 380). They operationalized community capacity as comprised of community capitals, namely, physical, human and social. In a personal communiqué, Dr. Kusel (2005) indicated that he now operationalizes it as including physical, financial, human, social and cultural.

Local expert knowledge was utilized to gather data regarding community capacity. 19 local expert workshops were conducted. First, participants were asked to individually complete a Community Capacity Worksheet. The worksheet included a narrative assessment of capacity as well as a rating of capacity on a seven-point scale. Then rankings across participants were summarized and reviewed by the group. Lastly, the group determined final capacity rankings for each aggregation.

A case study was conducted to evaluate the congruence between expert opinions and community self-assessments and to enable more in-depth analysis of particular communities. Community self-assessment workshops were conducted to identify key issues affecting community capacity and to rank community capacity on the seven-point scale. Several of the findings are salient to the discussion of Community Resiliency.

- First, they found that community capacity and socio-economic status measure different aspects of well-being. They provide complementary perspectives on well-being, but are not strongly related and are relatively independent.

- Second, community capacity reflects a dynamic and multi-dimensional component of well-being.

- Third, social capital proved the most important community capital.

- Fourth, human capital is the only community capital reflected in the socio-economic scale, and only partially.

- And finally, even though a person's skills and expertise may be added to the aggregate of human capital in a community, that person may diminish social capital by her inability or unwillingness to contribute to the community.

THE COMMUNITY RESILIENCE PROJECT

Colussi (2000) and the Community Resilience Team (1999) describe the Community Resilience project. The Centre for Community Enterprise initiated this project in response to the significant changes facing small, isolated, resource-dependent communities and their need to develop resilience. The Community Resilience Manual[23] includes an assessment of community resiliency and a tool to assist with the development of a community resilience plan to develop the community's capacities. The community resilience framework is undergoing continual testing and revision through numerous community applications. A number of methods are utilized to gather data, including personal interviews, organizational inventories, town hall meetings, focus groups and written surveys.

Colussi (2000) defines a resilient community as one 'that takes intentional action to enhance the personal and collective capacity of its citizens and institutions to respond to and influence the course of social and economic change' (p. 11). Resilient communities:

- Approach sustainable development within the community from a multi-dimensional perspective, i.e., economic, social, political and ecological;

- Consciously maximize limited resources on endeavors that promise the greatest return for the community;

- Focus on building local capacity;

- Mobilize the community around shared priorities;

- Mobilize internal resources and leverage external resources;

- Have a critical mass of collaborating organizations through which community endeavors are implemented.

---

[23] Community Resilience Manual is available in pdf format at www.cedworks.com

A community's social and economic structure is seen as having four dimensions: *people* and their beliefs, skills and participation; *organizations* and their level of collaboration; *resources* and the community's use and development of them; and *community process*, i.e., the nature and extent of community economic development. 23 measures were developed to address these dimensions, some of which have been validity tested in field study applications. A few findings relevant to this study follow:

- Resilience is not static. It changes in relation to internal and external stressors, so needs be tracked over time.

- Resilience is not a fixed quantity within communities, but rather can be developed and strengthened over time. 'As resilience is strengthened, the capacity to intentionally mobilize its [the community's] people and resources to respond to, and influence social and economic change is enhanced' (Community Resilience Project Team, 1999, pp. 1-5).

- Social capital is very important.

- Measures needed include those that signal progress in developing community capacity.

- As perceptions are influenced by such factors as culture, age, income, and tenure in a community, it's important to consider representation of these factors in selection of interview respondents.

NW RURAL COMMUNITY ASSESSMENT

Harris, McLaughlin, Brown and Becker (2000) conducted an assessment of communities in the upper Columbia River basin for the Interior Columbia Basin Ecosystem Management Project (ICBEMP). The project assessed community resilience, defined as a community's ability to respond and adapt to change in the most positive, constructive ways possible for mitigating the impacts of change on the community.

Several sets of data were collected. First, empirical data were gathered from the Bureau of Census. Second, residents from a randomly selected sample of communities completed a community self-assessment workbook. Those residents then participated in a self-assessment workshop. Community officials were then contacted to provide other documented details about the communities. Third, economic profiles were created for all communities in the study. Fourth, 'significant change communities', defined as undergoing major change, were identified. Key informants, i.e., those with detailed knowledge of the specific change, were interviewed. Of these communities, a sample was selected for an in-depth case study. And finally, a representative survey of residents of a county was conducted. Salient findings from this study include:

- Generally, the larger communities tended to be more resilient. They tended to have more developed and extensive infrastructure, a larger workforce and more diversified economies. This finding supports the Forest Ecosystem Management Assessment Team (1993) finding that communities that were less able to adapt tended to have limited infrastructure, less economic diversity, less active leadership, more dependence on other communities and weaker links to centers of political and economic influence.

- Towns with a critical mass of social capital and infrastructure were more likely to have vital social groups and civic organizations, increased educational infrastructure, available services, development grants and greater preparedness for the future.

- Communities are unique, as are their experiences of and responses to change. Hence, they must be studied on a case-by-case basis to develop a detailed understanding.

- Resilience of a community is relative, so study of community resilience needs focus on degrees of resilience. Resilience changes over time as communities develop and respond to change.

- Caution should be exercised in the use of easily measured social indicators, such as employment and income levels, crime rates and divorce rates as they are simplistic and are not good measures.

- Noting the existence of services is not adequate. Perceptions of their adequacy must also be ascertained. 'Self assessment is a logical part of any mitigation measure as it will reflect the values of people living in the communities; provide a vehicle for integrating local knowledge in policy decisions; and contribute to a sense of community-level ownership in the resulting recommendations' (Forest Ecosystem Management Assessment Team, 1993, p. 75).

- Public participation is more effective in both the long and short term than a hands-off, technocratic approach to collecting data (Taylor & Bryan, 1990).

- Residents can be lay experts about their communities. Local perceptions and attitudes, the organization of the community, and how its citizens think, perceive, and respond can sometimes be as important for understanding the potential impacts of a project as the details of the project itself (Branch et al., 1982).

MT. HOOD LOCAL UNIT CRITERIA AND INDICATOR DEVELOPMENT (LUCID) PROJECT

The Mt. Hood LUCID project (Magis et al., 2004) was part of the Local Criteria and Indicator Development Project initiated by Chief, Mike Dombeck, of the USDA Forest Service. The purpose of the LUCID project was to develop and assess the feasibility of a forest-scale monitoring program based on the Montreal Process Criteria and Indicators. The monitoring program would be designed for use by forest managers to improve forest management plans, enhance collaboration between National Forests and other government agencies, and relate forest plan outcomes to national criteria and indicator trends. At the Mt. Hood National Forest test site, under the direction of Dr. Craig Shinn, criteria and indicator suites were developed for environmental, social and economic domains, data availability was ascertained and demonstration data were provided. As part of the development of social indicators, the Mt. Hood team introduced the concept of Community Resilience. It included built relationships, civic enterprise and civic competence.

AUSTRALIAN SOCIAL CAPITAL FRAMEWORK

Edwards (2004) describes the framework developed by the Australian Bureau of Statistics (ABS) to measure social capital. It includes a conceptual framework as well as recommended indicators for measurement of various aspects of social capital. The ABS held a number of consultations around Australia to discern interest in the use of social capital. Government officials, leaders of nonprofit organizations and university researchers all applauded the development of a framework and protocol for tracking social capital in Australia. This paper reviews in extensive detail the measurement protocol developed by ABS. In addition to its use in Australia, it is also a contribution to international discussions on the harmonization of social capital data to allow for comparison across countries.

SOCIOECONOMIC RESILIENCY IN WASHINGTON COUNTIES

Daniels (2004) adapted the model developed by Horne and Haynes (Horne & Haynes, 1999) to measure community viability and adaptability. The study was based on the premise that the link between forest management and the well-being of communities in forested areas needs be defined by both economic and social factors, not just employment. A more comprehensive approach to evaluating community well-being was tested by combining social and economic indicators.

Of significance, in deciding to utilize secondary data, the study focused on county resiliency, not community resiliency, so findings can not be generalized to communities within the county boundaries. The study examined three dimensions of Washington counties; socioeconomic resiliency, forest and timber dependency, and county reliance on timber.

Of interest was the identification of "counties of concern" (p. 5), i.e., those counties that were potentially more sensitive to changes in forest management practices. Counties of concern were identified by combining information about counties that might have difficulty adapting to change with information about counties that were particularly forest dependent.

COMMUNITY RESILIENCE IN THE WESTERN CAPE OF AFRICA

Ahmed et al (2004) describe a study to discern the resiliency of three low socio-economic neighborhoods in the Western Cape. Communities were selected through a purposive sampling technique, with particular focus on those which experienced significant socioeconomic stress and which were underserved by professional, social and health services. Community leaders were contacted to develop rapport and collaborative working relationships and to gain approval for administering the study in the communities. Data was collected via a resiliency questionnaire, injury profiles and a demographic questionnaire. The study was partially replicated from a previous study (Butchart, Kruger, Lekoba, & Lebese, 1998). To develop the resiliency questionnaire, the literature was reviewed, an advisory committee was consulted and community-based focus groups reviewed the drafts. A random sampling procedure was utilized to select interviewees.

THRIVE: A COMMUNITY RESILIENCE ASSESSMENT TOOL

Davis et al. (2005) describes THRIVE, a community assessment tool designed to facilitate the identification and development of community resources that promote positive health and safety outcomes, especially for minority, poor and marginalized people. It is based on the presumption that communities can develop the resiliency to thrive despite risks introduced into them. The THRIVE tool focuses on community assets and developing capacity with those assets. The tool covers built environment, social capital, services and institutions and structural factors. The THRIVE tool has been piloted in several communities with successful results.

COMMUNITY RESILIENCE IN ECUADOR

Seligson (nd) describes a study to discern the resiliency within the northern region of Ecuador. The study examined the contribution of study participants to the solution of local problems, civil society participation, crime, trust in local government, trust in Junta Parroquial, satisfaction with local government, trust of friends and trust in neighbors. The study compared three provinces to the nation, divided into urban and rural areas.

SOCIAL CAPITAL COMMUNITY BENCHMARK SURVEY

The Social Capital Community Benchmark survey (The Saguaro Seminar: Civic Engagement in America, 2001) is part of a concerted campaign by three dozen community foundations to rebuild connections within their respective communities. The survey was administered in 40 communities to discern the status of social capital in each. It provides a baseline of the strengths and deficits in civic behavior against which results of subsequent interventions can be measured. 11 different dimensions of social capital emerged from the survey; trust, diversity of friendships, political participation, civic leadership and associational involvement, informal socializing, giving and volunteering, faith-based engagement and equality of civic engagement. The survey was designed by the Saguaro Seminar, a project of the John F. Kennedy School of Government at Harvard University and was led by Dr. Robert D. Putnam. Questions selected were those already extensively tested in previous surveys.

ORGANIZATIONAL ASPECTS OF COMMUNITY EMPOWERMENT

Laverack (2001) conducted an extensive literature review on community empowerment, community capacity, community participation and community competence with the intent of operationalizing the concept of community empowerment to guide practitioners. He focused on organizational aspects of community empowerment as they represent the community processes that enable community members to mobilize and collaborate for social and political change. He used concept-mapping involving textual analyses of case studies and inter-observer agreement on selection of domains. The domains that emerged from the analysis included; participation, leadership, resource mobilization, problem assessment, links with others, organizational structures, asking 'why', the role of outside agents and programme management.

HEARTLAND CENTER RURAL COMMUNITY SURVIVAL

The Heartland Center is an independent nonprofit organization whose mission is to assist local leaders respond to current and future challenges in their communities[24]. The center has developed a popular tool by which communities can assess their strengths, weaknesses and opportunities. The 20 characteristics are listed in Appendix A and clearly fit within the Community Capitals Framework, lending further credence to the widespread acceptance of the notion of community resources/assets/capitals as the basis from which to develop community capacity.

DISCUSSION & CONCLUSIONS

This section is structured to provide specific direction to the Roundtable conversation. First, important terms are defined. They form the basis from which the protocol will be developed. Then, principles from the Literature and Practice Review particularly salient to the protocol are summarized. The principles lead to important conclusions regarding the design of the measurement protocol. Those conclusions are presented. Next, the framework from which the measurement protocol will be developed is presented. Finally, questions which the Indicator 38 workgroup will present to the Roundtable are presented.

---

[24] http://heartlandcenter.info/whoweare.htm

DEFINITIONS

Community is defined herein as a social grouping of people residing in a specific geographic territory. The community has a particular history, specific demographic patterns and houses, industries and organizations. Community members establish patterns of interaction for multiple purposes, e.g., political, economic and social, and can mobilize community resources to take collective action for the benefit of individuals and/or the community. While towns are typical communities, rural communities can extend beyond the city limits or may be unincorporated, and larger cities may be comprised of several smaller communities. Forest communities are those that are adjacent to forests or are dependent on forest-based industries.

Community resilience is defined as the existence, development and engagement of community resources to thrive in a dynamic environment characterized by change, uncertainty, unpredictability and surprise. Resilient communities intentionally develop personal and collective capacity to respond to and influence change, to sustain and renew the community and to develop new trajectories for the community's future.

THE PURPOSE OF INDICATOR 38

The purpose of Indicator 38 is to generate a national level picture of the resilience of forest communities. The specific use of Indicator 38 data for informing a national level report has important implications.

First, communities are complex and dynamic. A comprehensive understanding of them requires in-depth analysis using numerous metrics associated with various community dimensions. Developing such a comprehensive understanding of the thousands of forest communities in the United States and aggregating that into a concise national report is impossible. Hence, two modifications need be made: 1) a purposefully select group of communities needs be sampled to provide a representation of the specific dimensions relevant to the MPCI; 2) the metrics utilized need be narrowed to the 'critical few' that serve as the best possible proxies for dimensions of community resiliency.

Second, the data generated for each community may be helpful, but will not be comprehensive enough to assist communities to analyze their own resiliency. Further, the information will be reported in some aggregate form based on the stratification method selected for sampling, so individual communities will not be able to discern community specific data. The stratification method will also dictate the extent to which counties, states and regions can extrapolate findings for their needs. Three recommendations are offered to address these challenges: 1) retain community-level data and make it available to interested parties; 2) provide a comprehensive list of metrics with which communities can analyze their own resiliency; 3) retain the ability to aggregate the data in various ways to accommodate the information needs of interested parties.

GUIDING PRINCIPLES FOR THE DESIGN OF THE MEASUREMENT PROTOCOL

Several critical points are distilled herein from research and practice.

1. Studying a phenomenon at different scales produces different results. Each scale utilizes different indicators and measurement protocols, produces different kinds of information and provides different perspectives on the same general question, and is of interest to

different stakeholders. Studies conducted at one scale may be of little use in understanding the phenomenon at a different scale.

2. Different kinds of data are available at different scales. For example, the county level offers a rich source of secondary data via the census which is apro pos for county specific questions. County level data, however, are not appropriate for answering questions about specific communities or about community resilience.

3. Studies of human/social phenomena need be conducted at the level at which the dynamics of that phenomena are occurring. Communities are the appropriate unit of analysis for community specific issues, e.g., community resilience. Community level data can then be aggregated to examine the question from other scales, e.g., county or national.

4. Information gathered at the community level will tend to be more informal and undocumented than information collected at higher scales. It is most likely embedded in the customs, traditions and experience of community members. It will offer great variety and rich detail.

5. If secondary data availability and collection costs become the primary criteria for selection of data collection methods, the question of community resiliency will likely not be answered. Cost effective data collection methods can be designed that mine critical and salient primary data.

Recommendations following from these principles are fourfold:

1. the appropriate scale at which to study community resilience is the community level;

2. data collection will need to include primary as well as secondary data;

3. data collection methods will need to be effective, i.e., answer the question of community resiliency, and cost effective; and

4. data from communities will need to be aggregated to the national level.

An important benefit of utilizing this approach is that it institutionalizes access to the unique knowledge offered by local and indigenous peoples and integrates it into national data. Hence as the national report is referenced for setting political agendas and establishing policies, the voice of local and indigenous people will be included.

COMMUNITY RESILIENCE MEASUREMENT PROTOCOL FRAMEWORK

Social indicators need include integrated sets of metrics that are organized around an explicit theoretical framework. This framework provides the context in which the measurement protocol is designed. It clarifies the expectations of the picture the protocol will produce. It provides the rationale for metric selection, and guides the design of data collection and analysis methods. Finally, it contains the criteria through which the protocol is evaluated. This section describes the framework for the Community Resilience indicator.

Purpose: The purpose of Indicator 38 is to generate a national level picture of the resilience of forest communities. Through successive national reports, trends in the resilience of sample communities will be discerned, suggesting similar patterns in comparable communities.

Framework Rationale: The framework for Indicator 38 is the Community Capital Framework (CCF). The CCF enables examination of community resilience through the integrated and comprehensive framework of community capitals. Capitals are resources or assets available within and invested in the community. There are seven capitals; natural, social, cultural, financial, built, political and human. As community resilience is about development and engagement of community resources (capitals) to thrive in a dynamic and changing environment, tracking the existence and changes in community capitals will provide information critical to discerning the changing resilience of forest communities.

Metric Selection: Metrics need be selected that provide salient and accurate information regarding each of the capitals for the specific sampled communities. A number of metrics have been developed and tested in various research and application projects (see Attachment A). The metrics were analyzed to discern their fit within the Community Capitals Framework. Attachment B displays the suite of metrics organized according to the CCF. From this suite, metrics particular to the MPCI will be selected.

Data Collection and Analysis: Data collection needs occur at the community level and incorporate both primary and secondary data. A stratification scheme, or typology, needs be developed to ensure the national report reflects a representative sample of communities. Appropriate community level key-informants need be identified and consulted to provide the best possible information on the community. An index needs be created with numerical codes to enable comparison across communities and aggregation of community data to the national level.

KEY QUESTIONS FOR ROUNDTABLE DISCUSSION

Research and practice related to community resilience have established a substantial foundation from which to develop the Community Resilience measurement protocol. There remain logistical questions that simply require time and further research to address. These kinds of questions relate to specific metrics and potential data sources. They will not be addressed in the Roundtable meeting as they will not best engage the resources and expertise brought to the table by participants.

There also, however, remain questions of significance related to the purpose of the MPCI and to the many in the Roundtable that collaborate to ensure that its administration in the United States is of the highest possible caliber. A number of these questions are listed herein to stimulate consideration as Roundtable participants prepare for the September, 2007 meeting.

These questions, or questions like them, will likely be posed during the Roundtable meeting with the hope of generating a constructive and informative discussion. Ideas generated at the meeting will then be mined by the Indicator 38 workgroup as they finalize development of the measurement protocol.

The first questions relate to the issue of scale. They include:

1. What are issues with reflecting community level data at the national level?
2. How can national level data be made useful for people interested in different scales?
3. What are the tradeoffs associated with representing the information at various scales?
4. How is the scale issue dealt with in the other indicators?

The second question relates to creating a typology of communities to be sampled.

1. What are the important dimensions of communities to be represented in the sample?

CONCLUSION

The purpose of this Literature and Practice Review is to catalyze a conversation within the Roundtable regarding the development of a measurement protocol for Indicator 38, Resilience of Forest-Dependent Communities. The Literature and Practice Review and Roundtable discussion fit within a larger project, the purpose of which is to design a measurement protocol for the indicator. To accomplish that purpose, the information gleaned from the Roundtable discussion will be integrated with that generated from the Literature and Practice Review. Both will be analyzed by the Community Resilience Workgroup to generate the measurement protocol.

The Literature and Practice Review explored the history and context for Community Resilience both generally and within the context of the Montreal Process Criteria and Indicators. Terms essential to the community resilience construct were examined. Issues critical to the design of an associated measurement protocol were explored. Community capitals were introduced as the framework for the development of the community resilience measurement protocol. A number of on-the-ground applications and research of community resilience were presented, along with an analysis of particular metrics utilized. The Discussion and Conclusions section described the path forward based on the findings of the literature review and the research/application projects. Finally, questions which the Indicator 38 Workgroup would like the Roundtable participants to consider were presented.

REFERENCES

Adger, N. W. (2000). Social and ecological resilience: Are they related? *Progress in Human Geography, 24*(3), 347-364.

Adger, N. W. (2006). Vulnerability. *Global Environmental Change 16*(3), 268-281.

Adger, N. W., Hughes, T. P., Folk, C., Carpenter, S. R., & Rockstron, J. (2005). Social-ecological resilience to coastal disasters. *Science, 309*(5737), 1036-1039.

Ahmed, R., Seedat, M., van Niekerk, A., & Bulbulia, S. (2004). Discerning community resilience in disadvantaged communities in the context of violence and injury prevention. *South African Journal of Psychology, 34*(3), 386-408.

Aigner, S. M., Flora, C., & Hernandez, J. M. (2001). The premise and promise of citizenship and civil society for renewing democracies and empowering sustainable communities. *Sociological Inquiry, 71*, 493-507.

Alcorn, J. B. (2000). Keys to Mapping's Good Magic. from www.iied.org/sarl/pla_notes/pla_backissues

Alston, M. (2004). You don't want to be a check out-chick all your life: The out-migration of youth from Australia's small rural towns. *Australian Journal of Social Issues, 39*(3), 300.

Anderies, J. M., Janssen, M. A., & Ostrom, E. (2004). A framework to analyze the robustness of social-ecological systems from an institutional perspective. *Ecology and Society 9*(1), 18.

Bebbington, A. (1999). Capitals and capabilities: A framework for analyzing peasant viability, rural livelihoods and poverty. *World Development, 7*, 2021-2044.

Beckley, T. M. (1998). The nestedness of forest-dependence: A conceptual framework and empirical exploration. *Society and Natural Resources, 11*(2), 101-120.

Berkes, F., Colding, J., & Folke, C. (2000). Rediscovery of traditional ecological knowledge as adaptive management. *Ecol Appl, 10*, 1251-1262.

Berkes, F., Colding, J., & Folke, C. (Eds.). (2003). *Navigating Social–Ecological Systems: Building Resilience for Complexity and Change.* Cambridge, UK: Cambridge University Press.

Berkes, F., & Folke, C. (1998). *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience.* Cambridge: Cambridge University Press.

Berkes, F., & Seixas, C. S. (2005). Building resilience in lagoon social–ecological systems: A local-level perspective. *Ecosystems, 8*, 967-974.

borealforest.org. Communities and the Workforce: Living with Change.   Retrieved June 1, 2007, from http://www.borealforest.org/world/can_mgmt11.htm

Borrini-Feyerabend, G. (1997). Beyond Fences: Seeking Social Sustainability in Conservation. Gland, Switzerland: IUCN (World Conservation Union)/Kasparek Verlag.

Bourdieu, P., et al. (1999). "THE WEIGHT OF THE WORLD: SOCIAL SUFFERING IN CONTEMPORARY SOCIETY (2nd edition)." *x+646pp, CA: Stanford U Press, 1999.*

Branch, K., Thompson, J., Creighton, J., & Hooper, D. (1982). The Bureau of Land Management Social Effects Project: Guide to Social Assessment. Billings, MT: Mountain West Research.

Brown, B. A. (1995). *In Timber Country: Working People's Stories of Environmental Conflict and Urban Flight.* Philadelphia, PA: Temple University Press.

Burt, J., & Copteros, A. (2004). Dramatic Futures: A Pilot Project of Theater for Transformation and Future Scenarios, *Unpublished report for the Environmental Education Department.* South Africa: Rhodes University.

Butchart, A., Kruger, J., Lekoba, R., & Lebese, M. (1998). The three neighborhoods safety promotion programme. *UNISA Psychologia, 25*(1), 19-39.

Carroll, M. S., & Lee, R. G. (1990). *Occupational community and identity among Pacific Northwest loggers: Implications for adapting to economic change.* Boulder, CO: Westview Press.

Chambers, R. (1994). Participatory rural appraisal (PRA): Analysis and experience. *World Development, 22*, 1253-1268.

Chambers, R., & Richards, P. (1995). Preface. In D. M. Warren, L. J. Slikkerveer & D. Brokensha (Eds.), *The Cultural Dimension of Development: Indigenous Knowledge Systems.* London, UK: Intermediate Technology Publications.

Chaskin, R. (2001). Building community capacity: A definitional framework and case studies from a comprehensive community initiative. *Urban Affairs Review, 36*(3), 295-323.

Chaskin, R., Brown, P., Venkatesh, S., & Vidal, A. (2001). *Building Community Capacity.* New York, NY: Aldine de Gruyter.

Coleman, J. (1988-9). Social capital in the creation of human capital. *American Journal of Sociology, 95*, 95-120.

Colussi, M. M. (2000). The Community Resilience Manual: A Resource for Rural Recovery and Renewal.   Retrieved June 1, 2007, from www.cedworks.com/communityresilience01.html

Community Resilience Project Team. (1999). The community resilience manual: A new resource will link rural revitalization of CED best practice. *Making Waves, 10*(4), 10-14.

Constanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hanson, B., et al. (1997). The value of the world's ecosystem services and natural capital. *Nature, 387*, 253-260.

Costello, D., & Johns, M. (2006). Understanding and Building Resilience in the South West. West Perth, Australia: Injury Control Council of WA, Inc.

Daniels, J. M. (2004). Assessing Socioeconomic Resiliency in Washington Counties, *Gen. Tech. Rep. PNW-GTR-607* (pp. 35). Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Daubon, R. E., & Saunders, H. H. (2002). Operationalizing social capital: A strategy to enhance communities' "capacity to concert". *International Studies Perspectives, 3*, 176-191.

Davis, R., Cook, D., & Cohen, L. (2005). A community resilience approach to reducing ethnic and racial disparities in health. *American Journal of Public Health, 95*(12), 2168-2173.

Davis Smith, J. (1998). The 1997 National Survey of Volunteering. London, UK: Institute for Volunteering Research.

Doak, S. C., & Kusel, J. (1996). Well-being in Forest-dependent Communities, Part II: A Social Assessment Focus, *Sierra Nevada Ecosystem Project: Final report to Congress.* Berkeley, CA: Davis: University of California, Centers for Water and Wildland Resources.

Donoghue, E., & Sturtevant, V. (2007). Social science constructs in ecosystem assessments: Revisiting community capacity and community resiliency. *Society and Natural Resources, in press.*

Donoghue, E., & Sutton, L. (2006). Socioeconomic conditions and trends for communities in the Northwest Forest Plan region, 1990 to 2000. In S. Charnley, E. Donoghue, C. Stuart, C. Dillingham, L. Buttolph, W. Kay, R. McLain, C. Moseley, R. Phillips & L. Tobe (Eds.), *Socioeconomic Monitoring Results* (Vol. Volume III: Rural Communities and Economies). Pacific Northwest Research Station, Portland, OR: U.S. Department of Agriculture, Forest Service.

Durkheim, E. (1958). *Professional Ethics and Civic Morals.* Glencoe, IL: The Free Press.

Edwards, R. W. (2004). Measuring Social Capital: An Australian Framework and Indicators. Retrieved June 1, 2007, from www.ausstats.abs.gov.au/ausstats/free.nsf/Lookup/13C0688F6B98DD45CA256E360077D526/$File/13780%5F2004.pdf

Emery, M., & Flora, C. (2006). Spiraling-up: Mapping community transformation with community capitals framework. *Journal of the Community Development Society, 37*(1).

Fabricius, C., Scholes, R., & Cundill, G. (2006). Mobilizing knowledge for integrated ecosystem assessments. In W. V. Reid, F. Berkes, T. Wilbanks & D. Capistrano (Eds.), *Bridging Scales and Knowledge Systems: Concepts and Applications in Ecosystem Assessment.* Washington, DC: Island Press.

Fawcett, S. A., Paine-Andrews, A., Fransiso, V. T., Schultz, J. A., Richter, K. P., Lewis, R. K., et al. (1995). Using empowerment theory in collaborative partnerships for community health and development. *American Journal of Community Psychology, 23*(5), 677.

Fey, S., Bregendahl, C., & Flora, C. (2006). The measurement of community capitals through research: A study conducted for the Claude Worthington Benedum Foundation by the North Central Regional Center for Rural Development. *Journal of Rural Research & Policy, 1*(January).

Field, J. (2004). *Social Capital.* London, UK: Routledge.

Field, J., & Hedges, B. (1984). A National Survey of Volunteering. London, UK: Social and Community Planning Research.

Flora, C. (nd-a). Enhancing Community Capitals: The Optimization Equation. *From the Director* Retrieved June 1, 2007, from http:www.ncrcrd.iastate.edu/newsletter/mar97/enhance.comm.cap.html

Flora, C. (nd-b). Measuring rural development: Why not just count jobs? [Electronic Version]. *Rural Development News*, *Summer, 1996*. Retrieved June 1, 2007, from http://www.ncrcrd.iastate.edu/newsletter/jul96/measureerdev.html

Flora, C., Bregendahl, C., Fey, S., Chen, L., & Friel, J. (2004). Rural Community and Economic Development Case Study Review: A Quantitative Analysis, *Prepared for the Claude Worthington Benedum Foundation.* Iowa State University: North Central Regional Center for Rural Development.

Flora, C., Emery, M., Fey, S., & Bregendahl, C. (nd). Community Capitals: A Tool for Evaluting Strategic Interventions and Projects.   Retrieved June 1, 2007

Flora, C., & Fora, J. (2004). *Rural Communities: Legacy and Change* (2nd ed.). Boulder, CO: Westview Press.

Flora, J. L., Sharp, J., Flora, C., & Newlon, B. (1997). Entrepreneurial social infrastructure and locally initiated economic development in the nonmetropolitan United States. *The Sociological Quarterly, 38*(4), 627.

Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change, 16*, 253-267.

Folke, C., Berkes, F., & Colding, J. (1998). Ecological practices and social mechanisms for building resilience and sustainability. In F. Berkes & C. Folk (Eds.), *Linking Social and Ecological Systems.* Cambridge: Cambridge University Press.

Folke, C., Colding, J., & Berkes, F. (2003). Synthesis: building resilience and adaptive capacity in social-ecological systems. In B. F., C. J. & F. C. (Eds.), *Navigating Social-ecological Systems: Building Resilience for Complexity and Change* (pp. 352-387). Cambridge: Cambridge University Press.

Force, J., & Machlis, G. (1997). The human ecosystem Part II: Social indicators in ecosystem management. *Society and Natural Resources, 10*(4), 369.

Forest Ecosystem Management Assessment Team. (1993). Forest Ecosystem Management: An Ecological, Economic, and Social Assessment. Portland, OR: U.S. Department of Agriculture; U.S. Department of the Interior [and others].

Friedman, M. S. (1997, May). A Guide to Developing and Using Performance Measures in Results-based Budgeting. *Prepared for the Finance Project* Retrieved June 1, 2007, from http://www.financeproject.org/Publications/measures.html

Gibbon, M., Labonte, R., & Laverack, G. (2002). Evaluating community capacity. *Health and Social Care in the Community, 10*(6), 485-491.

Glaeser, E. L., Laibson, D., & Sacerdote, B. (2002). An economic approach to social capital. *The Economic Journal, 112*, 437-458.

Gramling, R., & Freudenburg, W. (1992). Opportunity--threat, development, and adaptation: Toward a comprehensive framework for SIA. *Rural Sociology, 57*(2), 216-234.

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology, 78*(6), 1360-1380.

Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology, 91*(3), 481-510.

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

Gunderson, L. H., & Pritchard, L. (Eds.). (2002). *Resilience and the Behavior of Large Scale Ecosystems, SCOPE vol. 60*. Washington, D.C.: Island Press.

Gusfield, J. R. (1975). *Community*. New York, NY: Harper and Row.

Gutierrez-Montes, I. (2005). *Healthy Communities Equals Healthy Ecosystems? Evolution (and Breakdown) of a Participatory Ecological Research Project Towards a Community Natural Resource Management Process, San Miguel Chimalapa (Mexico)*. Unpublished Dissertation, Iowa State University, Ames, IA.

Harp, A. J., & Pauley, T. (1993). A Social Profile of Seven Communities in Custer and Lemhi Counties, *AER 93-13*. Moscow, ID: Department of Agricultural Economics and Rural Sociology.

Harris, C. C., McLaughlin, W., Brown, G., & Becker, D. R. (2000). Rural communities in the inland northwest: An assessment of small communities in the interior and upper Columbia River basins. In T. M. Quigley (Ed.), *Interior Columbia Basin Ecosystem Management Project: Scientific Assessment, Gen. Tech. Rep. PNW-GTR-477* (pp. 120). Portland, Oregon: Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Healy, K., Hampshire, A., & Ayres, L. (2003). Engaging Communities for Sustainable Change: Promoting Resilience. Retrieved June 1, 2007, from www.bensoc.org.au/research/engaging_communities.html

Home Office. (1999). Community Self-help - Policy Action Team no. 9. London, UK: Home Office.

Horne, A. L., & Haynes, R. W. (1999). Developing Measures of Socioeconomic Resiliency in the Interior Columbia Basin Gen. Tech. Rep. PNW-GTR-453. In T. M. Quigles (Ed.), *Interior Columbia Basin Ecosystem Management Project: scientific assessment.* Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Jackson, E. J., Lee, R. G., & Sommers, P. (2004). Monitoring the community impacts of the Northwest Forest Plan: An alternative to social indicators. *Society and Natural Resources, 17*, 223-233.

Jackson, S. F., Cleverly, S., Poland, B., Robertson, A., Burman, D., Goodstadt, M., et al. (1997). Half Full or Half Empty? Concepts and Research Design for a Study of Indicators of Community Capacity. North York, Ontario: North York Community Health Promotion Research Unit.

Kaufman, H. F. (1959). Toward an interactional conception of community. *Social Forces, 38*(8-17).

Kaufman, H. F., & Kaufman, L. C. (1946). Toward the substitution and enrichment of a forest community: The Montana Study. Missoula, MT: University of Montana.

Krannich, R. S., Carroll, M., Damiels, S., & Walker, G. (1994). Incorporating Social Assessment and Public Invovlement Processes into Ecosystem-based Resource Management: Applications to the East Side Ecosystem Management Project, *Rep. 43-OEOO-4-9111.* Moscow, ID University of Idaho: Department of Resource Recreation and Tourism.

Kretzmann, J. P., & McKnight, J. L. (1993). Building Communities from the Inside Out: A Path Toward Finding and Mobilizing a Community's Assets. Evanston, IL: Center for Urban Affairs and Policy Research, Neighborhood Innovations Network, Northwestern University.

Kusel, J. (1996). Well-being in Forest-dependent Communities, Part I: A New Approach, *Sierra Nevada Ecosystem Project: Final report to Congress.* Berkeley, CA: Davis: University of California, Centers for Water and Wildland Resources.

Kusel, J. (2001). Assessing well-being in forest-dependent communities. In G. J. Gray, M. J. Enzer & J. Kusel (Eds.), *Understanding Community-Based Forest Ecosystem Management* (pp. 359-384). Binghamton, NY: Food Products Press.

Kusel, J., & Fortmann, L. P. (1991). *Well-being in forest-dependent communities: Volume I.* Sacramento, CA: California Department of Forestry Forest and Rangeland Assessment Programo. Document Number)

Lauglo, J. (2000). Social capital trumping class and cultural capital? Engagement with school among immigrant youth. In S. Baron, J. Field & T. Schuller (Eds.), *Social Capital: Critical Perspectives.* Oxford, UK: Oxford University Press.

Laverack, G. (2001). An identification and interpretation of the organisational aspects of community empowerment. *Community Development Journal, 36*(2), 40-52.

Lee, R. G. (1989). Sustained yield and social order. In R. G. Lee, D. R. Field & W. J. Burch (Eds.), *Community and Forestry: Continuities in the Sociology of Natural Resources*. Boulder, CO: Westview Press.

Lewis, M., & Lockhart, R. A. (2002). Performance Measurement, Development Indicators & Aboriginal Economic Development.   Retrieved June 1, 2007, from www.cedworks.com

Lorenz, E. (1999). Trust, contract and economic cooperation. *Cambridge Journal of Economics, 12*, 301-315.

Lovell, C. A., Mandondo, A., & Moriarty, P. (2002). The question of scale in integrated natural resource management. *Conservation Ecology, 5*(2), 25.

Machlis, G., & Force, J. E. (1988). Community stability and timber-dependent communities. *Rural Sociology, 53*(2), 220-234.

Magis, K. (2005). Community Indicator Report, *Final Report to the U.S. Roundtable on Sustainable Forests*.

Magis, K. (2007, in press). Global civil society: Architect and agent of international democracy and sustainability. In J. Dillard, V. Dujon & M. C. King (Eds.), *Understanding the Social Aspect of Sustainaiblity*. New York, NY: Routledge.

Magis, K., Shinn, C., Lankford, N., Rice, J., Ervin, D., & Welch, A. (2004). Local Unit Criteria and Indicator Development: Olallie Lake Case Study Application, *A final report to the USDA Forest Service*. Portland, OR: Portland State University.

Millennium Ecosystem Assessment (MA). (2003). Dealing with scale. In *Ecosystems and Human Well-being: A Framework for Assessment* (pp. 107-126). Washington, DC: Island Press.

Morgan, G. (1997). *Images of Organizations*. Thousand Oaks, CA: Sage Publications.

Narayan, D., & Pritchett, L. (1999). Cents and sociability: Income and social capital in rural Tanzania. *Economic Development and Cultural Change, 47*, 871-897.

Odum, H. W. (1936). *Southern Regions of the United States*. Chapel Hill, NC: The University of North Carolina Press.

Onyx, J., & Bullen, P. (2000). Measuring social capital in five communities. *The Journal of Applied Behavioral Science, 36*(1), 23 - 42.

Perrings, C. A., Ma¨ ler, K.-G., Folke, C., Jansson, B. O., & Holling, C. S. (Eds.). (1995). *Biodiversity Conservation*. Dordrecht: Kluwer.

Pretty, J. I., Guijt, I., Scoones, I., & Thompson, J. (1995). A Trainer's Guide for Participatory Learning and Action, *IIED Participatory Methodology Series*. London, UK: International Institute for Environment and Development.

Pretty, J. N. (1998). *The Living Land: Agriculture, Food and Community Regeneration in Rural Europe*. London, UK: Earthscan Publications Ltd.

Putnam, R. (1996). Who killed civic America? *Prospect, 7*, 24-72.

Putnam, R. (2000). *Bowling Alone: The Collapse and Revival of American Community*: Simon and Schuster.

Rossi, R. J., & Gilmartin, K. J. (1980). *The Handbook of Social Indicators: Sources, Characteristics, and Analysis*. New York, NY: Garland STMP Press.

Savage, A., Isham, J., & McGrory Klyza, C. (2005). The greening of social capital: An examination of land-based groups in two Vermont counties. *Rural Sociology, 70*(1), 113-131.

Schallau, C. H. (1990). Community stability and change in forest-based communities: A selected bibliography. In R. G. Lee, D. R. Field & W. J. Burch (Eds.), *Community and Forestry: Continuities in the Sociology of Natural Resources*. Boulder, CO: Westview Press.

Schuller, T. (2000). Human and social capital: The search for appropriate technomethodology. *Policy Studies, 21*, 25-35.

Schwartz, M., Bridger, J., & Hyman, D. (2001). A validity assessment of aggregations methods for multiple key informant survey data. *Journal of Community Development Society, 32*(2), 226-237.

Seligson, M. (nd). Special Report: Community Resilience on the North Border [Electronic Version]. Retrieved June 31, 2007, from http://sitemason.vanderbilt.edu/files/h0jTzy/Special%20Report%20Community%20Resilience%20on%20the%20North%20Border%20Ecuador.pdf

Shiva, V. (2000). Foreward: Cultural diversity and the politics of knowledge. In G. S. Dei, B. L. Hall & D. G. Rosenberg (Eds.), *Indigenous Knowledges in Global Contexts: Multiple Readings of Our World*. Toronto, ON: University of Toronto Press.

Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change 16*(3), 282-292.

Stanton-Salazar, R., & Dornbusch, S. (1995). Social capital and the reproduction of inequality: Information networks among Mexican-origin high school students. *Sociology of Education, 68*(2), 116-135.

Stedman, R. C., Parkins, J. R., & Beckley, T. M. (2004). Resource dependence and community well-being in rural Canada. *Rural Sociology, 69*(2), 213-234.

Stone, W., Gray, M., & Hughes, J. (2003). Social Capital at Work: How Family, Friends and Civic Ties Relate to Labour Market Outcomes.   Retrieved June 1, 2007, from www.aifs.org.au/

Taylor, C. N., & Bryan, C. H. (1990). A New Zealand issues-oriented apprpoach to social impact assessment. In J. I. Finsterbusch & L. Llewellyn (Eds.), *Methods for Social Analysis in Developing Countries*. Boulder, CO: Westview Press.

The Saguaro Seminar: Civic Engagement in America. (2001). The Social Capital Community Benchmark Survey Executive Summary.   Retrieved July 1, 2005, from http://www.cfsv.org/communitysuvey/index.html

Tocqueville, A. d. (2001). *Democracy in America. In Heffner R. (Ed.).* New York, NY: Penguin Putnam Inc.

Turner, R. (1999). Entrepreneurial neighborhood initiatives: Political capital in community development. *Economic Development Quarterly, 13*(1), 15-22.

U.S. Department of Heatlh, E. a. W. (1969). Towards a Social Report. Washington DC: U.S. Government Printing Office.

Walker, B. H., Holling, C. S., Carpenter, S. R., & Kinzig, A. P. (2004). Resilience, adaptability and transformability in social–ecological systems. *Ecology and Society 9*(2), 5.

Wilbanks, T. (2006). How scale matters: Some concepts and findings. In W. V. Reid, F. Berkes, T. Wilbanks & D. Capistrano (Eds.), *Bridging Scales and Knowledge Systems: Concepts and Applications in Ecosystem Assessment*. Washington, DC: Island Press.

Wilkinson, K. P. (1991). *The Community in Rural America*. New York, NY: Greenwood Press.

Williams, C. (2004). Community capacity building: A critical evaluation of the Third Sector approach. *Review of Policy Research, 21*(5).

Woolcock, M. (2000). Social capital and its meanings. *Canberra Bulletin of Public Administration, 98*, 17-19.