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SUSTAINABILITY OF HUMAN COMMUNITIES IN PRAIRIE GRASSLANDS

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ABSTRACT—Explorers and colonists in the American grasslands viewed the landscape as barren and its people as savage. Both the land and its people needed to be controlled, and this often led to the destruction of both the environment and its inhabitants. Our perception of the landscape influences our actions toward it. As we redefine our perception of the landscape, we act differently toward it. We have begun to appreciate the important ecological functions provided by prairie grasslands. Understanding all the resources in plains communities — the human, social, financial and environmental forms of capital — and the impact of each of these types of resources on the others should allow resilience to change and movement toward a more sustainable future, one that balances people and place in the grasslands.

Introduction

Although human beings impact living systems, often without recognizing that they are doing so, most do not act purposely toward something until it has a name (Mead 1934; Baldwin 1986). And, how we name something determines how we act toward it (Miller 1973). Often land and people define each other (Bookchin 1990; Harvey 1996).

The two most important grasslands in the western hemisphere — the Great Plains in the United States and Canada and the Patagonia in Argentina — were first regarded as deserts by the Europeans who “discovered” them (Schwieder 1996; Herring 1965; De Santillán 1965). Deserts were wild and savage. Such desert grasslands needed to be tamed by the plow and subdued, changed, or destroyed. The people on the plains were also viewed as wild and savage, people who needed to be controlled or destroyed. The early incursions and later settlements were all based on that naming and definition. Neither the natural grassland nor the traditional knowledge of the indigenous inhabitants were recognized. Instead, the land was “barren,” and the people were “uncivilized” (Hidalgo 1984; Gasteyer and Flora 2000). And when either did not immediately correspond with the colonists’ views,
they were destroyed (Bunton 1997; Falah 1991; De-Shalit 1995; Prucha 1986; Vileisis 1997).

Tilling the land for profit was important to the new settlers and their government sponsors, even if the ecosystem would not sustain the activities (Morman 1919). Those who did not confront nature in this way were viewed as savages (White 1983). Controlling nature and people were equated (Harvey 1996).

We are now revising our definition of the grasslands, particularly the temperate steppes (see, e.g., Laurenroth et al., pp. 223-59). Our redefinition of grasslands can change how we act toward them. Appreciation of the complex systems of the grasslands is growing, as is the knowledge of the indigenous peoples and how they developed their land management practices (e.g. Flores, pp. 343-55). We now understand that sustainable systems for prairie grasslands reflect the relationship between the landscape and the people in it.

Understanding the resources of a place is critical for sustainability. Sustainability is multidimensional. In the United States, the President’s Council on Sustainable Development (1997) has suggested the three “E”s as elements that define sustainability: environment, economics, and equity. These dimensions are often treated as if they were distinct and separate, although they actually influence each other significantly in the long-term. It is possible to have one without the others, at least for a short time (World Commission on Environment and Development 1987). While grasslands can be irrigated and farmed for a large profit, it is often at the cost of environmental quality; water and soil quantity and quality may deteriorate irreparably (Opie 1993). Thus, it is critical to look at all three components as an optimization, rather than as a maximization process for any one dimension. This requires monitoring each of the components over time, in order to achieve the balance necessary for sustainability (Mueller 1999; Condom 1999; Rozelle 1997; Greiner 1996).

“Holistic Management” uses another version of the three “E”s. Based on the work of Alan Savory (1999), previously called “Holistic Resource Management,” farm managers employ a variety of techniques to reach the tripartite goal of balancing environment, economics, and quality of life.

Grassland Communities

Community is the interaction of individuals for mutual support. Process, more than function, defines such communities (Flora et al. 1992). This
definition of community suggests that there are two kinds of communities: communities of interest and communities of place. Communities of interest are groups, formal and informal, of people who share a particular interest. For example, one of the communities of interest that cares about water fowl, which depend upon prairies wetlands, is Ducks Unlimited. Another community of interest that cares about habitat and birds on grasslands is the Audubon Society. Communities of interest influence what happens on the plains' grasslands by affecting social, political and economic institutions to change policies and behavior. Communities of place are geographically located on the prairies. Quinter, Kansas, and Steele, North Dakota, are representatives of such communities of place. Their presence deters prairie, so their impact is more direct. And, communities of place deal with both environmental and social concerns by their individual and collective decisions related to land and water use. However, their ability to control economic activities is decreasing (Flora 1990).

All communities have multiple resources. These resources can be consumed, and therefore become unavailable to current or future generations. Alternately, they can be stored, for future but not current generations. And, finally, they can be invested for both present and future needs of all generations (World Commission on Economic Development 1987). When resources are used to create new resources, they are called “capital.” This is close to Daly’s (1968) definition of capital, as matter capable of trapping and making energy available for human purposes. This definition thus includes both biological entities and the environment. Folke and Berkes (1998) are even more explicit, defining capital as “a stock of resources with value embedded in its ability to produce a flow of benefits.” This differs from the business usage of the term “capital,” which relies only on monetary criteria. Sociologists find it useful to distinguish different forms of capital: human, social, natural, and financial or built. Sustainability involves investing in the forms of capital that do not deplete other forms (C. Flora 1998). Thus, a strategy to maximize short-term financial capital, through intensive, irrigated agriculture can decrease natural capital through salinization of the soil or loss of wetlands. Or, using children as labor in factories can increase financial capital, through decreasing labor costs, but it lowers human capital since they leave school to go to work.

The way agriculturists and communities handle their resources, both individually and collectively, depends on their collective vision for the future (Engel 1997; Maarleveld and Desbegnon 1999). That vision can be sustainable, or not. If the vision has a single end, such as “more is better,”
then sustainability will be impaired. Sustainability requires choice and balance, which gives resiliency to change over time (Folke and Berkes 1998). Resilience means that a community has conserved opportunities for innovation and renewal (Folke and Berkes 1998).

Forms of Capital

I consider four forms of capital in a model to analyze the interaction of people with the landscape in grassland communities (Fig. 1). It is critical to name these resources in order to act toward them. George Herbert Mead (1934) argued that you have to name something to have consciousness of it. And without consciousness of resources, we cannot act to sustain them. Not only will unknown species become extinct, but key forms of human relationships can vanish unless we are aware of what they are. Ignorance does not always lead to the disappearance of either species or social forms, but only awareness will enable the actions that sustain them. Thus, knowledge of these various stocks within a system is critical. Only by explicit awareness, through naming, can we act toward these stocks in ways that enhance them as capital.

The four forms of capital, in the order that they best address community development, are: 1) human capital, 2) social capital, 3) financial manufactured capital, and 4) natural capital (Fig. 1). In our work with communities, we have found that one has to deal first with the people (human capital) and the relationships (social capital) before one can mobilize these to maintain and enhance natural capital. Starting with natural capital often leads to conflict, and that conflict detracts from all forms of capital (Paulson 1998). Successful actions to enhance natural capital start with the recognition of human capital, the skills, knowledge and abilities of local people; and, these actions build social capital, involving increased communication and networks and increased initiative and responsibility. Such activities are done around environmental issues, usually in terms of place, but they are critical predecessors of actions to improve natural capital (Cortner and Moote 1999; Pomeroy and Beck 1999).

Measuring Sustainability of the Forms of Capital

Awareness of a resource is not enough to ensure action to sustain it. People and institutions usually act when they think they can make a difference. And, sometimes well-intentioned actions do not yield the expected results. For example, urban renewal in the 1960s tore down established
Figure 1. The four forms of capital that need to be named in order to enable actions to balance and sustain all of them.

"deteriorated" mixed neighborhoods, where businesses were integrated with homes, to create massive housing developments. The social capital of the neighborhoods was destroyed, and the result led to increased crime and physical deterioration of the new infrastructure (Judd 1973; Monti 1993). And, early cattle ranching, such as in the Little Colorado River Basin, had negative environmental impacts as the ranchers were unaware of the complex biodiversity in the grasslands (Abruzzi 1995).

What we measure reflects what we subsequently do. We have found (C. Flora et al. 1997) that community-based measures can enhance stocks of capital when they:

1. show progress toward achieving identifiable goals,
2. enable key participants to see how to improve the system,
3. facilitate communication of effectiveness and performance.
Human Capital

Human capital consists of the resources of individuals, such as education, skill, health, knowledge acquired through experience and formal learning, values, and leadership ability. Human capital is mobile across space. Each person can take their human abilities to a different location if they have the economic resources, social support, and legal right. Measures of community sustainability include identification of locally available skills, talents, and knowledge and, then, enhancement and recombination of these resources for use in the community (C. Flora et al. 1997).

For agriculturists in the industrialized countries of the world, there is a progressive reduction in the variety of skills needed in the production process with more industrialization (Havens 1985). For example, successful ranching once depended on production skills. Those skills included an understanding of the local ecosystem and an ability to adapt to changes in nature, particularly weather and available forage (Gefu and Gilles 1995). Maintenance of biodiversity was an important risk reduction strategy (Berkes et al. 1995; Baskin 1997). Local knowledge, such as criteria for bull selection and an understanding of the microclimate, aided both rancher and community survival. Those who did not develop and apply that local knowledge, such as cotton farmers in the southern United States and small grain farmers in the Great Plains (Hurt 1994), ultimately were not sustained. Evidence of such losses includes “natural disasters,” such as cottoned-out land and the dying towns and ghost towns left in the wake of the dust bowl (McDean 1986; Hurt 1994).

In the 1930s, additional mechanical skills were required to supplement production skills for farmers and farming community success. In the United States, farmers acquired cars before they acquired tractors (Jellison 1993), giving farm household members and rural communities a chance to acquire mechanical skills. Then, these skills could be used to keep farm machinery and farm-to-market transportation running (Jellison 1993). The livery stable and the blacksmith disappeared, and the garage and machinery dealer provided the new services needed (Jellison 1993). New needs required new skills to meet them. However, not all blacksmiths became auto mechanics and not all horse farmers became tractor farmers.

After the Second World War, knowledge of chemicals and their use became a critical new skill for farming success (Perkins 1978). Nitrogen derivatives that are now used as fertilizers were originally developed from petroleum by-products during World War II for the armament industry, using huge government investments (Nelson 1990). After the war, other uses...
were sought (Nelson 1990). Agriculture became one of those uses, and productivity per acre increased substantially (Nelson 1990). At the same time, the number of farms declined rapidly, as fewer farmers were needed to produce more. Constant or falling prices meant that it was necessary to maximize short-term production to make the same amount of money as before (Boehlje 1995).

In the 1970s and 1980s, dramatic changes occurred in trade dynamics and the macro-economic setting. First, hyper-inflation affected commodity and land prices (Knutson et al. 1998). High commodity prices were followed by inflation control measures, and these increased competition among commodities, leading to low prices in the 1980s (Flora 1990). Financial management skills were now required for farm success (Flora 1990). Financial management was a major challenge since, in general, farmers were attracted to the profession because they liked working outdoors and operating farm equipment. These “doing” activities and skills are often antithetical to the “reflecting” skills required in financial management. For example, meticulous record-keeping aids successful financial managers, yet this takes training as well as interest and aptitude. Thus, farmers learned the necessary skills, delegated them to others, such as a spouse or other household member, or left farming (Knutson et al. 1998).

Cooperative extension in many states was extremely active in implementing the Dairy Herd Improvement (DHI) program for dairy animal record-keeping (DeLorenzo and Thomas, 1996; Pecsok et al. 1992). While it took an enormous research and extension effort, begun at Cornell University, adoption of the program had the advantages of: an easily measurable output, since dairy cow herd managers could measure milk volume, bacteria count, percent milk fat, etc., on a daily basis; a firm price through dairy cooperatives; and, government price floors. Record-keeping in beef production operations was minimal, compared to dairy production (Lawrence 1998). This was true despite efforts by the extension service to introduce record-keeping in the beef cattle industry since at least the 1950s (See, e.g., Riggs and Maddox 1955; Gregory 1961). The operators who produced the cows and calves and the stocker/feeder cattle were skilled in managing the animal, the husbandry skills. And, the operators who managed the feedyards and the packing plants were skilled in managing the market (Gustason 1998).

By the end of the 1990s, prices for commodities dropped as a consequence of increased competition. Trade barriers were reduced through the passage of international trade agreements, such as the North American Free Trade Agreement (NAFTA), and this had an impact on agriculture (Knutson et al. 1998). Competition within the US increased as the removal of supply
control measures, under the 1996 Farm Bill, brought more land into the production of agricultural commodities (USDA 1996; Boehlje et al. 1999). As a consequence, the pressure on the grasslands increased. More crops were planted on lands prone to wind erosion. And, aquifers were tapped to irrigate corn for intensive hog and beef operations (Hurt 1994).

Relational skills are now required in the production of beef, if those who manage the resource — the cow/calf operator and stocker/farm feeder — are to retain profitable enterprises. Shifts have occurred in control of food animal value-added chains, the links between the producer and the end user. These shifts mean that ranchers must work together to gain bargaining power (Welsh 1997). New connections to markets are required to shorten the value-added chain (Titus 1996). Shortening these chains, and providing better flow of information from the end user to the producer, can help the producer deliver a high value product to the consumer and to make a reasonable profit (Soucie 1997). To be responsive to increasingly diverse consumer demand, producers must not only be aware of what consumers want, but must also be able to deliver those specific sets of qualities to those who are willing to pay for them. This means moving from commodities, where the main price signal is volume, to products, where the price signals are multiple and based on product qualities. To do this effectively, ranchers must form new alliances among themselves, such as cooperatives or private for-profit companies, to assure availability of animals with the specific qualities that are desired by particular end users. Thus, good communication skills become critical to relationships with other farmers, the local community, and potential end users.

Under previous national policy, only one kind of relationship was important to the ranchers, that was the one with the US Congress (Browne 1995). The federal government was constantly pressured by the commodity groups that were supported by the “check off” system, a voluntary tax that was based on the number of animals or bushels of the commodity sold and generated a set amount of money for each group. These funds have been used to maintain, or increase, commodity production and profitability by influencing national policy. Examples of issues addressed include: increasing barriers to the entry of competing products, while opening new markets to US products; urging the government to buy the commodity for use on military bases, school lunch programs, and international food programs; and, supporting research to increase the amount or quality of the commodity produced (Knutson et al. 1998). In sum, new relationships are needed as new market mechanisms replace old governmental mechanisms (Folke and Berkes 1998).
**Social Capital**

Social capital consists of mutual trust, reciprocity, groups, collective sense of a shared future, and collective action (J. Flora 1998). Social capital takes a long time to develop. For example, in his research on Italy, Putnam (1993) suggested that social capital levels formed in the Middle Ages continued into present times, and accounted for much of the contemporary political and economic differences among different parts of Italy.

In research on natural resource-based communities, we found two major areas that identify communities that are sustainable in terms of social capital (C. Flora et al. 1996). These are communities with: strong relationship and communication networks, and, those with high levels of community initiative, responsibility, and adaptability. Strong relationships and communications networks allow significant interactions among diverse groups within the community and outside the community, and they increase the public availability of information and knowledge (J. Flora et al. 1997). High levels of community initiative, responsibility, and adaptability help create a shared community vision. This vision builds on internal resources to achieve ways of responding to change, and it avoids development of a victim mentality toward change.

Sustainable agriculture is producing a great deal of social capital. This approach to agriculture encourages producers to develop more sustainable farming practices and consumers to buy more sustainable food (Kloppenburg et al. 1996). An increasing number of groups are focused on sustainable livestock, grazing, holistic management, and sustainable farming (Hassein and Kloppenburg 1995; Stinner et al. 1997). These groups generate and share knowledge about their systems and practices. Also, new relations between farmers and consumers are developed through a variety of direct marketing activities such as community-supported agriculture (Kloppenburg et al. 1995) and farmers’ markets (Garrett and Feenstra 1999). Eating more local produce decreases transportation costs and, by changing seasonally, it increases food diversity while supporting the local community (Allen 1993).

**Natural Capital**

Natural capital consists of clean air, clean and sufficient water, enough uncontaminated high quality soil, biodiversity, landscape structure, as well as ecological understanding (Berkes et al. 1994). Healthy ecosystems provide multiple community services that underlie community sustainability,
such as carbon sequestration, water storage, and water filtration (Daily 1997; Folke and Berkes 1998).

Communities of place can determine ecosystem health by monitoring water, soil, air, green space, and biodiversity (C. Flora et al. 1997; Mansvelt 1998). Farmers have developed additional measures of ecosystem health. One example is the monitoring tool kit developed by the Land Stewardship Project in Minnesota (Land Stewardship Project 1999). The goal of the team that developed this set of economic, environmental, and social measures was to provide farmers with tools to monitor the long-term impact of changes on their farms. Many farmers are now using this kit (Dansingburg 1999).

My colleagues and I (C. Flora et al. 1997) assess the health of local ecosystems for providing multiple community benefits by using three major sets of indicators of the extent to which the following occur:

1. human communities plan and act in concert with natural systems,
2. ecosystems are used for multiple community benefits,
3. groups with alternative uses for the ecosystem seek common ground.

Land use conflicts are an increasing issue in rural and grassland communities (Cortner and Moote 1999). Concern with property rights has led individual landowners to resist state regulations on their land, either passively or actively. One group of individuals, with a focus on the issue of “takings” stresses their conviction that private property means an absolute right to do whatever one wants to do on their own property. That stance has also led landowners to demand that the actions of others not be allowed to decrease their property values, their health, or their current enjoyment of their own property (Munro 1993; Camacho 1998). Finally urban sprawl, particularly the development associated with a shift from farmland to residential housing, has created new alliances between farmers and environmental groups in grassland areas (Gunderson et al. 1995).

**Financial and Built Capital**

Financial capital includes: debt capital, representing money that is borrowed; investment capital, the money that is derived from selling a share in the firm; derivatives, or the financial instruments which represent a pooled set of values such as a mutual fund, but not any specific firm; taxes and tax
relief; and, external grants. Financial capital is important for community sustainability because it leads to the creation of built capital. Built capital in a community is often referred to as physical infrastructure, and it includes: roads, schools, sewer systems, libraries and town municipal buildings, as well as individual factories, housing, farm machinery, and fences (Lapping et al. 1989). Our research suggests that the sustainability of built capital is dependent on a local diverse and healthy economy (Flora and Flora 1993; J. Flora et al. 1997). One of the four measures of a diverse and healthy economy is high asset value of community members, particularly represented by the proportion of the population that owns their land and home. The other three measures are: low poverty, high firm efficiency, and high firm diversity.

Influencing Action

How does a community get the social actors — individuals, firms, and governments — to act sustainably? Application of social control theory (Staples 1997; Bierstedt 1963) to the four forms of community capital can help determine appropriate strategies (C. Flora 1998). To insure actions that contribute to sustainability, the best mechanism is education of the human capital. People need to want to do what is sustainable and to feel empowered to act sustainably. Internalization of values takes place in the context of family, school, and religion (Kohn 1969; Moscovici 1985). The importance of moral action comes from the values one receives, usually when one is relatively young. However, adult value shifts to a new morality can occur (Fisher and Geiger 1991). Old patterns of environmental degradation continue in some communities because social values have not changed as evidence of damage has emerged.

However, if ethical controls fail, then social pressure provides the next level of control (Bursik and Grasmick 1993; Sapp et al. 1994). For instance, you may want to use a moldboard plow and plant a monoculture of corn on all of your land. This would allow you to get your farming done quickly, ease tracking your markets, and give you winters off in sunny Florida. However, you know that such land management would contribute to wind erosion, which would fill your neighbors’ ditches with silt. This would anger your neighbors and possibly embarrass you in the community. As a result, you use techniques that cause less soil-disturbance, and you put in more diverse crops, making your land less susceptible to erosion. Social pressure takes place in the context of community, which includes family, school and church,
as well as in relation to others whose opinion you value (Bursick and Grasmick 1993). It is most effective when there is face-to-face interaction. Civil society is based on this kind of social control (Etzioni 1995).

When social pressure fails, economic controls are often put into place (Bursick and Grasmick 1993). Landowners can be paid to withdraw highly erodible land from production (USDA 1999). Or, fines can be levied for services, such as clearing out roadside ditches downwind from eroding lands (Zilberman et al. 1999). Alternately, a farmer might receive a premium price for doing the sustainable economic activity, such as removing land from row crop production to raise grass-fed beef for the health market (Hassanein and Kloppenburg 1995). Economic sanctions take place within the community economy and within the state and nation (Smith and Tomasi 1999). Parents teach economics, for example by sanctioning their child by withholding the child’s allowance to penalize inappropriate actions.

Finally, when all else fails, when one continues to disregard the need to act sustainably, resists social pressure and refuses to pay fines and change their ways, then physical force might be used (Staples 1997). Imprisonment is an option, although to date few have been thrown into prison for such behavior (Zilberman and Lipper 1998). If the actions create a major environmental hazard, the business could be closed. This happens most often when a large business is a recognizable point source of pollution (Couch and Kroll-Smith 1994). Deprivation of physical liberty or confiscation of property are viewed as a monopoly of the state; and, the state is expected to use these options as a last resort, when all other mechanisms have failed (Staples 1997).

To achieve sustainability, all forms of capital within a community need to serve as both the end and the means. The most effective mechanisms of change are influenced but not controlled, by the community, or the economy, or the government. Yet, community social influences, economic institutions, and governments can interfere with each other and the incentives offered to encourage sustainable action, by ignoring and undermining the critical forms of capital in communities (McGinnis et al. 1999). For example, past USDA policy has on the one hand provided funds for draining wetlands, at the same time that the Department of the Interior was providing funds for wetland restoration. Such conflicting actions decrease the community’s ability to move toward full sustainability.

For practices on ranch and public lands to change toward greater sustainability, institutions must change. Sustainability is based on integrated systems (Blum 1998). Institutions and organizations either facilitate or im-
pede actions that could help optimize the factors determining sustainability (Zilberman and Lipper 1998; Folkes and Berkes 1998). For example, for cow-calf operations to be sustainable, they must be profitable. One way to become more profitable is to link genetics and management practices to carcass and meat quality. To do this, organizations must be established that facilitate record-keeping over multiple owners in the beef supply chain. Specific markets must be identified to know what traits are needed. For sustainability, the traits should be characteristics that can be provided by genetics and good management. Buyers determine the grading quality of the carcass, judged by the amount and distribution of fat, and the feedlot is penalized if the beef carcass grades poorly. The cow-calf rancher needs to know how each beef carcass will be graded. Some communities are working with cooperative extension educators to set up record-keeping systems, to provide better feedback to the cow-calf operator or the stocker/feeder on the quality of the carcass. Such record-keeping requires a variety of community support services to help ranchers.

Some ranchers have tried retained ownership, which involves not selling an animal as it moves from range to feed lot to packer, in an attempt to increase profit margins by delivering a quality animal. However, some bankers are not sure how to lend on retained ownership. And, when credit is not forthcoming, cattle must be sold. Such problems related to community financial institutions have provided a real roadblock, for example, in establishing a “new cooperative” for quality beef in North Dakota (Patric 1998).

And, cattle that were sold by the head are now sold by the pound. Buying by the pound poses a challenge for feedlots that have to judge, by sight, the potential grading quality of a carcass. If carcasses are graded poorly, feedlots are penalized. The rancher, however, is seldom informed of the grade his cattle received. To improve transfer of such information from the feedlots to the rancher, communities are working with cooperative extension to create better record-keeping systems. This feedback, acquired through new networks that facilitate information flow, can provide benefits for both the rancher and the packers. Ranchers can work to consistently deliver the appropriate qualities of beef. And, the packers will be less likely to have to reject or downgrade a carcass. Laura’s Lean Beef is an example of this process. This company provides a highly integrated value-added chain, including: specific genetic lines for tenderness, taste and leanness; development and growth on family farms, providing a social justice characteristic that is important to some buyers; beef produced without hormones, which is desired by some consumers; beef fed forage grown without pesticides,
desired by some consumers; and, rangeland and pasture without pesticides. The ranchers and farmers receive a premium for their cattle, and in return agree to the conditions of production, including checks by the company to verify the production process for the Laura’s Lean Beef consumer (see http://www.laurasleanbeef.com/main.html).

In our studies of rural communities (Flora and Flora 1993; Flora 1995; J. Flora et al. 1997), we have found that human diversity is part of an entrepreneurial social infrastructure. This type of infrastructure predicted the successful economic activity that improved the economic and social well-being of the rural communities we studied. However, it was not enough just to have a diverse group of people in a single geographic location. Positive interaction among those individuals was required to form a sustainable community. We found three dimensions to the entrepreneurial social infrastructure, which is a particular formation of social capital (J. Flora 1998). These dimensions were: acceptance of alternatives, existence of networks, and mobilization of resources.

High levels of entrepreneurial social infrastructure in a community can increase resiliency, buffering system integrity in response to change, which leads to higher community sustainability (Flora and Flora 1993; J. Flora et al. 1997). However, community resilience and sustainability do not mean that everything remains the same or that it returns to the way things were in the past. Resiliency means response to constant pressure for change. Buffering means that there are options and alternatives in response to change. System integrity means that enough resource-conserving activities and feedback loops exist to allow communities to adapt to change. These components interact in a circular, rather than linear, pattern. However, as a system becomes more homogeneous and larger, feedback mechanisms can deteriorate. And, decoupling decision-making from feedback increases a system’s response time to change (Bawden 1992). Community entrepreneurial social infrastructure provides feedback mechanisms by increasing the local nature of decision-making and by creating linkages to external decision-makers (Flora and Flora 1993).

When a community shares a common futuristic vision, there is more acceptance of alternative ways of achieving it (Flora et al. 1996). Thus, for diversity to be an asset, a vision for the future must be articulated. Unfortunately, there is often resistance to diversity. Ideas that are not local, such as those from another religion, a different value system or a different culture, are often resisted (Besser 1998; Flora et al. 1992; Karsada and Janowitz 1972). Yet, those differing attributes can provide new perspectives to help
resolve local issues. Actually talking to each other often reveals a common community goal, and multiple ways of working toward it (Flora et al. 1996). Until commonality is found, diversity can be frightening (Campbell and Barrett 1992; Graber 1974). Yet, as economies diversify and efforts increase to balance growth with a healthy ecosystem, populations will change. Diversity contributes to community sustainability when people can still respect each other while disagreeing. In such situations, “win-win” solutions can be sought, solutions which honor diversity while working toward the common good (Flora and Flora 1993).

Resource mobilization to deal with a problem or issue starts with identifying all of the resources within the community: the human, social, financial, and natural capital. The more diverse these resources, the greater the community resiliency to challenge and change. Human capital and its role in resource mobilization, includes the willingness on the part of those with resources to invest in community projects (J. Flora et al. 1997). It also includes the willingness of the citizens to commit local taxes to community betterment (J. Flora et al. 1997; Flora and Flora 1993). A widespread identification and mobilization of a community’s resources enhances its long-term integrity (J. Flora 1998).

Social capital, and its role in resource mobilization, depends on the networks, groups, trust, and reciprocity that exist to help maintain system integrity (J. Flora 1998). Reciprocity in communities means that individuals give to the community on the expectation of personal benefit from collective gain (Flora et al. 1996). Narrow or restrictive social capital can, however, detract from system sustainability, such as when all ties are with people who think the same way and view change as frightening (J. Flora 1998; J. Flora et al. 1997). Always interacting with a small group of the same people decreases the interconnections within a system, weakening its integrity. Multiple networks and linkages inside and outside a community increase its integrity and sustainability by allowing greater resiliency (Granovetter 1973, 1985). Social capital also contributes to the buffering that is needed for the sustainability of a community. Trust, networks, and reciprocity all contribute support when the social system faces challenges, including economic ones like a dramatic drop in prices; environmental ones like a flood or a blizzard; or, social ones, like an increase of drugs in the schools (J. Flora 1998).

Financial capital is also a motivator in mobilizing resources. Equity capital is scarce in many rural areas, although debt capital is generally available (Federal Reserve Bank of Kansas City 1999). The availability of
financial capital, through such entities as The Nature Conservancy, American Farmland Trust or environmentally-conscious mutual funds, can promote long-term conservation of natural capital. Cost-sharing and tax abatements, such as the Conservation Reserve Program, can promote short-term investment in conservation measures.

Diverse perceptions of natural capital are important in taking advantage of the variety of ecological, production, and aesthetic functions provided. Depending on a community’s diversity, a complete set of environmental realities can be seen. Not all will agree on what is important about natural capital. Neither will one view dominate the discussion of environmental privilege relative to the contribution of financial, social, and human capital, or other forms of natural capital. Recognition of contested terrain can be the basis for working out alternative ways of improving sustainability. If groups are not in contact with each other, however, contested terrain can lead instead to deep, long-lasting community divisions. Thus, the interconnections, as well as the diversity, are critical for the social and ecological integrity of the system.

Natural capital is best conserved when it contributes to the development and maintenance of other forms of capital in the community of place. Raising buffalo for market takes: natural capital, the prairie grassland; social capital, the links between the market and buffalo ranchers; human capital, the knowledge to manage buffalo and grasslands; and, financial capital, the investment of members and cooperative debt. In this example, the application and coordination of the four forms of capital combine to create a more diverse economy, maintain a healthy ecosystem, and facilitate stronger networks and local initiative. Attention to all the forms of community capital and their contribution to system sustainability can provide essential feedback and resilience in response to constant change.

References


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