Generating Local Wealth, Opportunity, and Sustainability through Rural Clusters

Supported by the Ford Foundation

MARCH 2009

Regional Technology Strategies, Inc.
www.rtsinc.org

Table of Contents

Acknowledgements

Many Regional Technology Strategies researchers contributed to this report. Jana Shannon and University of North Carolina graduate students Zakia Barnes and Sarah Waterman conducted a number of the case studies in the compendium. Jenna Bryant contributed to the organization of the report, and Robert Donnan edited the final reports.

This report was supported by a grant from the Ford Foundation. Wayne Fawbush was instrumental in helping to shape the project and maintain its focus on the triple bottom line and wealth creation. Shanna Ratner, who is managing the integration of this with four other, complementary projects, also contributed to the organization and focus.

A number of people contributed comments on drafts, including Sergio Arzeni, OECD, France; Ifor Ffowcs Williams, Cluster Navigators, New Zealand; Deborah Markley, Center for Rural Entrepreneurship, North Carolina; Devon Winey, Mt. Auburn Associates; Tim Wojan, U.S. Department of Agriculture, Washington, DC; Phil Cooke, University of Wales, United Kingdom; David Wolfe, University of Toronto, Canada, and Burke Murphy, Department of Employment and Economic Development, Minnesota.

We also would like to acknowledge the assistance of Barbara J. Bardin, Chief Fantasy Officer of *Let's Pretend* in Burlington, Vermont, for catering and hosting the meetings, and Bill Mitchell of the Intervale Center for showing us their land sustainability/farming program.

Stuart Rosenfeld
Project Director
February 2009

Prologue

In September 2008, a small group of researchers, practitioners, and officials from across North America and Europe met on Lake Champlain in Burlington, Vermont to address the development of cluster strategies in less populated regions from a new perspective. The economic value of clusters as a focus for economic development had been well researched and widely acknowledged.

But given the effects of globalization, immigration, and environmental degradation on rural communities and people, we wanted to see which cluster initiatives would lead to sustainability and inclusivity. What kinds of companies tend to cluster in rural areas, why, and to what extent do they pursue, intentionally or unintentionally, "triple bottom line" outcomes that result in increased local wealth that is inclusive and sustainable?

Burlington and the entire state of Vermont in many respects epitomize the triple bottom line outcomes under discussion, with state and local policies in place for decades that have economic, social, and environmental objectives. Thus, the setting there on Lake Champlain was conducive to the deliberations.

Even though the participants came from different parts of the world and had very different experiences and views of both rural development and rural clusters, we were able to come to agreement on the basic parameters of rural clusters and the importance of raising the bar for our expectations of how rural clusters address social and environmental issues as they pursue their primary economic outcomes. Can clusters build wealth for all segments of the community in ways that are environmentally sustainable, and what kinds of interventions can help them succeed at all levels?

To help inform our discussions, we compiled a set of 50 vignettes of rural clusters from around the world. Each vignette includes descriptions of place, origin, context, interventions, and impacts.

The following document summarizes our deliberations, discussions, and recommendations.

Stuart Rosenfeld
February 2009

Participants, Burlington, Vermont, September 21-24, 2008.

Sergio Arzeni, OECD, Paris, France
Jason Bailey, MACED, Kentucky
Chris Beacham, Regional Technology Strategies, Carrboro, NC
Greg Bischak, Community Development Finance Institutions, Washington, DC
Bill Bishop, Daily Yonder, Austin, Texas
Dan Broun, Regional Technology Strategies, Carrboro, NC
Deborah Clayton, Commissioner of Economic Development, Frankfort, KY
Phil Cooke, University of Wales, United Kingdom
Wayne Fawbush, Ford Foundation, New York, NY
Ed Feser, University of Illinois, Springfield, IL
Rory Fraser, Alabama A&M, AL
Amy Glasmeier, MIT, Boston, MA
Chris Hayter, National Governors' Association, Washington, DC
Deborah Markley, Rural Policy Research Institute, Chapel Hill, NC
Heike Mayer, Virginia Tech, Blacksburg, VA
Burke Murphy, Department of Employment and Economic Development, MN
Shanna Ratner, Yellow Wood Association, Vermont
Stuart Rosenfeld, Regional Technology Strategies, Carrboro, NC
Devon Winey, Mt. Auburn Associates, Boston, MA
Emily Wise, Lund University, Sweden
Tim Wojan, US Department of Agriculture, Washington, DC
David Wolfe, University of Toronto, Canada

I. Introduction

Since the mid-1980s, clusters and their close kin — agglomerations, sectors, industrial districts, and networks — have become a cause celebre for rural development. In the recession of the early 1980s, the economic gains towns and small cities had been experiencing since the 1960s and 1970s quickly eroded. Rural areas were losing their edge in manufacturing to western European and Japanese companies, causing plant closings; small farms were being subsumed by agribusiness; and the new high tech companies were flocking to the cities.

Advocates believed that clusters and networks could lead to renewed economic growth and sustained competitiveness in less populated areas. Networks and clusters were initially presented as prescriptions for rural economic recovery, as collective solutions to problems endemic to rural areas. They were targeted at a broad range of economic and, in some instances, social problems. At the first international conference on networks (and implicitly clusters) held in Lisbon in 1993, a more modest expectation viewed clusters as "an excellent way to simultaneously promote the competitiveness of companies and cohesion of regions."[1]

Private foundations and public sector agencies concerned with distributional and social outcomes also took an early interest in clusters. The Appalachian Regional Commission, The European Union's Social Fund, and the World Bank got on board early, hoping that clusters would spur growth in economically distressed regions and communities and bring more jobs to marginalized populations.

Much of the interest in cluster approaches was due to their reliance on collaborative and cooperative activities. These concepts, ultimately accepted as fundamental to the success of clusters, reinforced the progressive predilection for an economic system that balanced competition with cooperation, individualism with collectivism, and growth with equity. They also appealed to systems analysts because clusters are in effect regional production systems that include all of the companies and institutions that explain the economic behavior of a place and "represent a distinct way of organizing economic data and viewing the economy."[2]

Initially, however, clusters initially were viewed through a single lens, one that saw economic outcomes—growth in jobs and enterprises and competitiveness. Although inclusivity, the second lens, was not an explicit goal of early network and cluster efforts, the populations targeted often were the least educated, least mobile, and lowest paid,

---

[1] Portugal Ministry of Industry and Energy, *Cooperation and Competitiveness: Inter-firm cooperation-a means toward SME competitiveness*, Proceedings of an International Conference, Lisbon, Portugal, October 6-8, 1993.

[2] Michael Porter, "Clusters and Competition: New Agendas for Companies, Governments, and Institutions." In *On Competition*, Michael E. Porter. Cambridge, MA: Harvard Business Review Books, 1998.

and the places targeted were those with the fewest resources and amenities and least likely to capture their share of the emerging technology-based growth opportunities. The new cluster strategies were opportunities to reach out to the most disenfranchised people and places to generate employment and entrepreneurial opportunities.

The third lens, environmental sustainability, was not yet in the line of sight. It was just beginning to be noticed, but due more to scarcity — as expressed in the Club of Rome's 1972 warning of an irreversible depletion of natural resources — than it was to the environmental degradation Rachel Carson warned of in *Silent Spring* in 1962 or Tom Paxton sang of in his prescient 1969 song "Whose Garden Was This?"

In the 1990s, as clusters became better understood and more widely promoted by consultants, cluster strategies entered the mainstream of economic development and emerged on the agendas of governors, ministers, and other political leaders. But the strategies also became more oriented more toward competitiveness and innovation, which led them to favor technology-intensive—and generally metropolitan—regions and industries. The series of "Clusters of Innovation" studies conducted with the Council on Competitiveness all focused on large metropolitan areas.[3] Public attention and resources were disproportionately targeted to new, hot, and primarily urban high-tech clusters like biotechnology, telecommunications, and information technology as well as to research universities.

A. Pursuing the Triple Bottom Line Outcomes

While the economy still sits on top of political agendas, most leaders now recognize the interdependence of jobs and the environment and, as the workforce ages, also the importance of the potential workforce represented by immigrant and undereducated populations. This project provides an opportunity to develop a new framework for designing and evaluating cluster strategies, one that focuses on community and regional wealth, on using three lenses, and on valuing and achieving the three following sets of "triple bottom line" outcomes simultaneously to increase and retain local wealth.

- Conventional *economic* outcomes that increase wealth in the aggregate.
- *Social* cohesion that expands economic opportunity and access to wealth.
- *Environmental* outcomes that produce more sustainable economies and healthier communities.

Economic outcomes completely dominated the objectives of clusters and networks until very recently. Nearly all funding agencies—even those that supported cluster strategies for low-income regions or populations—measured success in numbers of jobs created or saved, numbers of new enterprises, and growth in average wages.

The two other outcomes, however, also are rooted in those places that fomented cluster

---

[3] Michael Porter, et al. *Clusters of Innovation: Regional Foundations of U.S. Competitiveness*. Washington, DC: Council on Competitiveness. 2001.

policies. The community-based industrial districts of northern Italy that were ultimately retrofitted into the more universal model of clusters used in the U.S. have always had a social dimension. In many European districts, business and community values and interests have long been in sync. The European Commission's Directorate for Regional Policy and Cohesion was a relatively early adopter of cluster strategies in its programs for less favored regions.[4]

Members of Italy's industrial districts are mostly locally owned and handed down from father to son (and recently daughter), enabling cooperation and competition to co-exist. Firms develop a deep sense of social and environmental responsibility because their actions can directly affect the health of their friends and families. According to *Guide to the Italian Districts, 2005-2006*:[5]

> The district is not just a model of production. It is an expression of a territory. Therefore the entire territory must feel it is involved and not just a plain spectator but a player, capable of modifying and developing its distinctive traits, its distinguishing features.

Most industrial district imitators in the U.S., however, lack the homegrown infrastructure of the Italian communities or the resources of the European Union's Social Fund. The social outcomes of most public sector cluster strategies were primarily secondary effects. They were derivative or opportunistic outcomes resulting from member companies facing labor shortages or the government or foundations making available funds with social objectives. Interventions supported by foundations or public agencies with social objectives strove directly for more social benefits and inclusivity, but most proved too small in scale for long-term impacts on clusters.

Environmental impacts have received the least attention in cluster strategies until quite recently, when funders became more aware of the environmental consequences of economic activity, businesses began facing rising energy and transportation costs, and governments discovered the economic opportunities associated with protecting and cleaning the environment. In most developed economies, awareness has been a slow process, building with mounting evidence of the severity of the consequences of ignoring the issue. Such problems, however, tend to create opportunities for new clusters and new markets.

B. A larger context

This report is part of a larger effort supported by the Ford Foundation that includes three additional streams of analysis focused on rural areas. The first is entrepreneurial activity, the second is rationalizing value chains that reach rural areas, and the third is delivering financial and technical assistance to small rural businesses. Whereas the

---

[4] Stuart Rosenfeld, *Creating Smart Systems: A guide to cluster strategies in less favoured regions*, Luxembourg: Office of Official Publications of the European Community, 2002.

[5] San Pauolo Impresse, *DistrettItalia: Guide to the Italian Districts 2005-2006.* Montepuliciano, Italy: Le Balze, SRI, 2007.

rural cluster represents a model of how a regional economy works and is not a particular intervention,[6] the four elements are interlocked, interdependent tracks. Entrepreneurship is an intervention that has driven the formation of virtually all clusters but generally without any intentional cluster-specific strategy. Value chains are integral to the definition of clusters and are often, based on input-output analyses, used by economic development agencies to identify companies to recruit in order to fill perceived missing links.[7] Financial and business services also have been used as cluster interventions that, if specialized, support the expansion of a cluster through improved access to investment and working capital resulting from greater familiarity with the firms and their business operations.

The missing piece of the cluster strategy picture in rural and low-income areas is the skilled workforce and the system to develop it. The outmigration of talent from rural areas over the past century has been a continuing source of frustration and a barrier to growth, especially of technologically advanced clusters, in rural areas.

This document draws primarily from the discussions that took place at a workshop of 20 experts and practitioners who met in Burlington, Vermont in September 2008, from background papers prepared by participants, from summaries of 50 rural clusters compiled for this project, and, selectively, from the literature on clusters, rural development, and sustainability. It will address the following five questions.

- What types of businesses function as clusters in less populated regions today, and how are they faring?
- How has a "flatter, warmer, and more crowded" world affected the location, structure, and prospects of rural clusters?
- What clusters have been best and least able to address triple bottom line outcomes, and why?
- What forms of cluster interventions have been most successful in meeting triple bottom line goals?
- What cluster strategies and local policies can most effectively address triple bottom line outcomes, and what conditions are necessary?

We attempt to develop a compelling case for treating economic, social, and environmental outcomes as interdependent. Economic outcomes are affected by the quality of schools, the civic environment, and the social infrastructure. People pay more attention to environmental issues when they have good jobs and are invested in their community. Businesses address each when they fulfill personal or business needs. Clusters are in sync when they address all three.

---

[6] http://www.competitiveness.org/cid/cilist

[7] In the Ford project, value chains are applied primarily to agricultural products and intended to foster collaboration and improve triple bottom line outcomes along the chain.

II. The evolution of cluster strategies

The prototypical clusters on which so many contemporary policy makers and researchers cut their teeth in the 1980s were most prominent in northern and central Italy. These regions are dotted with specialized industrial districts that are composed of mostly very small, flexible, and networked artisan firms. More often than not, the districts are located in towns or small cities. Industrial districts are, in effect, local production systems that over time have developed the expertise in, knowledge about, and reputation for a certain set of products. After Michael Piore and Charles Sabel published *The Second Industrial Divide* in 1984, these districts and the flexible specialization they embodied became popular benchmarks for industrial modernization. They later became the idealized models frequently cited in the 1990s to demonstrate the economic value of specialization within a regional economy and of aggregation at a time when the conventional economic development attitude favored diversification and addressing individual firms' needs.

A. Adapting industrial districts to rural America

In the mid-1980s, it was becoming apparent to some rural economic development agencies that they could no longer rely on their traditional advantages of low taxes, low wages, and surplus labor to attract and keep manufacturing to sustain their economies. New competition—mainly from Japan and Western Europe, which were adopting more advanced technologies and producing higher-quality goods—neutralized the comparative advantages of rural communities.

Studies, including a Ford Foundation-supported study of the rural South's manufacturing by the Southern Growth Policies Board[8] and a major study for the National Academy of Sciences,[9] highlighted the lack of both technology among small and mid-sized enterprises (SMEs) and the skills to use it. Among the many places studied were Europe's Industrial Districts, as researchers sought to understand how they are able to effectively diffuse technology and modernize industry, as well as the roles of collaboration and associations. These approaches quickly became models for rural areas.

With support from the German Marshall Fund of the United States and other foundations, dozens of states and regions sent teams of representatives of business, education, and government to study policies and industries in Europe—most often in the thriving economies of Italy, Denmark, Germany, and the Netherlands. The northern Italian "flexible manufacturing network" became the accepted model for helping small

---

[8] Stuart Rosenfeld, Emil Malizia, and Marybeth Dugan, *Reviving the Rural Factory: Automation and Work in the South*, Research Triangle Park, NC: 1988.

[9] Manufacturing Studies Board, *Learning to Change: Reactions of Small Machine Shop Owners to the Automated Manufacturing Research Facility at the National Bureau of Standard*s, Washington, DC: National Academy Press, 1985.

firms survive in increasingly competitive global economies. Their stories were taken to heart and supported by a raft of public policies around the world. Gradually, environments that increased cooperation among businesses became a model to which much of rural America aspired.

But only a small number of places could boast of the degree of specialization, recognized brand, and market dominance associated with northern Italy's industrial districts. Carpets in Dalton, Georgia, hosiery in Hickory, North Carolina; motion furniture in northeastern Mississippi, and sports apparel in Eugene, Oregon could all claim to be similar to industrial districts, although in each region officials still pursued industrial diversification as protection against downturns in markets. Most places had to apply very loose definitions of scale and similarity to be able to claim a cluster.

To apply industrial districts to the U.S.—and to many other industrialized nations—the perceived strengths of the industrial districts were divided into two separate policy streams. The first was a set of policies to promote interfirm cooperation. The second was an array of policies to support industry "clusters," a term used initially to designate groups of interdependent companies and institutions that stood out because of their relative scale or potential for scale in a geographic area. Workshops and study tours sponsored by the German Marshall Fund of the United States promoted the first, and Michael Porter's 1990 book, *The Competitive Advantage of Nations*, set out a model and strategy for the second.[10]

Over time, however, the two variations melded into a single comprehensive strategy. Networks began to resemble associations that represent clusters, and clusters turned more to strategies that promote the networking tendencies of companies in clusters. In 1998, Phil Cooke and Kevin Morgan developed a framework for associative behavior, finding that "economic activity is increasingly based on notions of collective learning and that competition increasingly involves partnership and interactive innovation."[11]

Those who trained or became the early network brokers later became "cluster facilitators," and the early activities of The Competitiveness Institute, an organization to promote clusters formed in 1998 in Barcelona, Spain focused on facilitators as the foundation of most cluster initiatives. (See Table 1 for clarification of terms.)

---

[10] Michael Porter, *The Competitive Advantage of Nations*, New York: Basic Books, 1990.
[11] Philip Cooke and Kevin Morgan, *The Associational Economy: Firms, Regions, and Innovation*. Oxford: Oxford University Press, 1998.

Table 1: Definitions of models

Agglomeration	Geographic concentration of companies without respect to relationships
Network	Formal and closed alliance of companies with common purpose
Sector	Companies with the same North America Industry Classification, generally defined at 2-, 3-, or 4-digit level.
Industrial District	Geographic concentration of networked companies specializing in various parts of the value chain in a particular product line
Industry Cluster	Geographic concentration of interdependent companies across multiple industry classifications and their supporting institutions and organizations

Strategies to develop interfirm collaboration seemed to be adopted more readily in rural areas than in urban areas of the United States, perhaps because rural areas were more desperate to stop the hemorrhaging of jobs to foreign countries, and because their labor force lacked the skills needed to attract higher-technology growth industries.

Adversity became a stimulus for cluster initiatives as companies and communities found strength in numbers and cooperation. The economic collapse of a key industry, closing of a major employer, or persistent unemployment or underemployment paved the way for new approaches, and rural development agencies, community organizations, and other intermediaries introduced clusters and networks as alternatives to recruitment.

B. Comments on the birth of clusters

It is not our intent to delve very deeply into how rural clusters are born, grow, evolve, and mature. Given the current policy popularity of cluster strategies, there already is a massive body of literature that covers those topics in great depth. But it may be useful to mention some highlights drawn from the discussions in Vermont, the compendium of rural clusters, and selected rural development literature.

The origin of most rural clusters is traceable to some set of historical antecedents (path dependency) and accidental events (serendipity). Among the 50 clusters summarized in the Rural Cluster Compendium, 26 began as chance events and only eight were planned. The development of rural clusters has relied heavily on entrepreneurship, which is one of the four components of Ford Foundation's rural wealth creation project. Northern Alabama's 19th Century steel cluster, for example, led to a metalworking cluster, which in turn attracted an automotive cluster. A metalworking cluster along the Connecticut Valley flowed out of the weapons clearinghouse at the Springfield armory, and a luxury houseboat cluster in central Kentucky emerged from the two original boatbuilding companies.

The evolution, and sometimes reconstruction, of rural clusters almost always builds upon existing competencies and connections. They either emerge as an offshoot of cluster products or technologies, spin out new clusters that build on strong elements of its supply chain, or generate new demands among the existing customer base. Almost every rural cluster was conceived from a local innovation or single company. It expanded as skilled and entrepreneurial people took advantage of the innovation or left the company by choice to start up new firms, to compete with or complement the original firm—or by necessity when laid off. Some developed from a craft or subsistence tradition that was taken to a new scale or as the result of residents developing new products for niche markets that built upon and expanded existing competencies.

Northern Alabama's automotive cluster is anchored by Daimler Benz, Honda, and Hyundai assembly plants. The northern part of the state has about 150 suppliers of transmissions, exhaust systems, stamping and casting, and engine parts and components. Daimler Benz opened its plant in Huntsville in 1998, and Honda opened in the more rural Lincoln in 2001. Although recruited and heavily subsidized, the basis for this cluster was the state's older steel and metalworking cluster. For years, Birmingham and the surrounding counties were synonymous with the steel industry, dating back to the 1860s when they supplied the Confederate army with ammunition. After World War II, Japanese competition took over much of the industry, but the region retained a large number of metalworking companies. That led to an engine plant, strong training programs for the metals industry, and ultimately the fastest growing automotive cluster.
Rural Cluster Compendium, pg. 102.

As competencies develop and reputation grows, the cluster is predisposed to follow a path that builds on its prior knowledge and skills.[12] The hosiery cluster in the northern Italian town of Castel Goffredo was the result of a large German hosiery firm closing in the 1920s and skilled workers purchasing equipment and setting up their own shops. The furniture cluster in northeastern Mississippi flowed out of a single company setting up to mass produce furniture in 1948. Mississippi's catfish cluster developed as a result of J.B. Williamson digging the first commercial catfish pond in Humphries County in 1965.

Among the 50 clusters summarized in the compendium, the origin of:

- 22 evolved from a single company;
- 14 resulted from a developed set of skills in the region; and
- 9 came about as the result of a natural resource.

Among these, 13 resulted from a new technology or local innovation, either in the original company or in the workforce. Motion furniture's success was based on the

[12] David A. Wolfe and Meric S. Gertler, "Local Antecedents and Trigger Events: Policy Implications of Path Dependence for Cluster Formation," in Pontus Braunnerjelm and Maryann Feldman, *Cluster Genesis*, Oxford Press, 2006

application of mass production techniques to handcrafted furniture and Italy's success with ceramic tile was due to a single glaze process, new dyes, and then automation.

Further, among the 50 clusters:

- 6 were the result of an industrial recruitment effort, including Mississippi attracting Futorian Furniture; Northern Alabama getting Daimler-Benz and Honda assembly plants, and General Electric Plastics moving into the Berkshires.
- 40 were started by local firms, such as Crowley Farms in Vermont. Cheese cluster, J.B. Williamson's catfish farm in Mississippi, or National Log Construction in Montana's log home cluster.
- 4 were intentional state government strategies—Casinos in Tunica, Mississippi and wine in the North Carolina's Yadkin Valley

C. Initiatives to grow and support clusters

Most clusters have been boosted by some variation on one of two types of strategies. The first, "specialization," influences the use of public or private sector resources or services in ways that make them more directly relevant to a particular kind of industry. The second, "association," tries to influence relationships and increase interactions among firms.

Specialization affects business and technical assistance, research and development, market assistance and information, and—often most importantly—education and training, shaping it to the particular needs of the companies in the cluster. Association encourages and facilitates business networks and cluster-specific business associations by supporting facilitators and collaborative projects. It assumes that firms operating in a strong associational environment will discover shared interests and competencies, that they will aggregate their resources and collectively express their needs, and that their scale will give them greater visibility as a cluster and their brand.

These two strategies were considered the fundamentals of the many U.S. and international network programs supported by national, state, and regional governments and by private foundations in the 1990s.

In almost all instances, cluster initiatives have been aimed at overall wealth generation, not at impacts on the community or environment. The survey of initiatives and outcomes of 250 clusters worldwide described in the *Cluster Initiative Greenbook*,[13] produced by the Competitiveness Forum in 2003, listed no activities aimed at social or environmental goals.

Any progress in social or environmental ends has been the by-product of competiveness-driven initiatives, in most instances driven by resources directed toward those ends by agencies and foundations concerned with equity issues, by recognition of

---

[13] Orjan Solvell, Goran Lindquist, and Christian Ketels, *The Cluster Initiative Greenbook*, The Competitiveness Institute, Stockholm: Bromma tryck AB, 2003.

the market value of socially responsible or green products, or by the explicit purpose of the cluster itself (e.g., alternative energy or organic foods).

As the 20th Century came to a close the rhetoric began to change. The threat of climate change was more widely recognized by industry (and clusters), the press, and most citizens, if not by government. Clusters began to (a) add environmental and energy issues to their agendas and (b) cluster around the economics of energy or the environment. Michael Porter told *New York Times* columnist Tom Friedman that "pollution is simply a waste…. Companies that eliminate such waste will be using their capital, technology, and raw materials more productively to generate maximum value and, therefore, will become more competitive."[14]

Between 2006 and 2008, it seemed that nearly every major periodical published a list of ways to save the Earth, and many of the answers depended on changing economic activity in rural areas.

In 2007, 2,500 companies published a sustainability report, 10 times as many as in 1995. [15] The U.S., the largest consumer of energy per capita, lagged far behind every other industrialized nation in reports per capita, with more than 60 percent fewer reports per capita than any other industrialized nation and only one-sixth the rate of the United Kingdom.

Interest in inclusivity grew more slowly but surely in places with an aging workforce and immigrant population. Only a decade ago, Lewiston, Maine, a former mill town that had been unable to reinvent itself after the mills closed, was a dying community. An influx of entrepreneurial Somalis and Bantus with good trading connections has revived and reshaped its economy. The head of the local growth council said, "It's been an absolute blessing in many ways…just to have an infusion of diversity, an infusion of culture and of youth."[16] Labor force needs are changing the views of many clusters toward who's in and who's out.

The information collected for the compendium of 50 rural clusters provides evidence of the following types of interventions, with education and training the most common form.

- 28 Networking
- 39 Education or training
- 25 Services including entrepreneurial
- 25, Research and technology development
- 26 Marketing
- 17 Capital or infrastructure

---

[14] Tom Friedman, *Hot, Flat, and Crowded*, New York: Farrar, Straus, and Giroux, 2008. p. 273.
[15] PricewaterhouseCoopers, *American Perspectives*, 2008. http://www.pwc.com/extweb/home.nsf/docid/22343647E2458221852574B10053860E
[16] Jesse Ellison, "The refugees who saved Lewiston: A dying Maine mill town gets a fresh burst of energy," *Newsweek*, January 26, 2009.

D. Restructuring rural clusters for the 21st Century

While clusters remain a popular way to look at economies in both rural and urban areas, many individuals worry that concentrating on one set of companies might represent an overreliance on a particular industry that may not maintain a high-growth trajectory. Regional officials' fears of overspecialization have not been without foundation. A number of conditions, which will be described in more detail in Section IV, have converged to alter the landscape and climate of rural economies. These include the newly emerging technological capabilities of less developed countries; digitalization of communications and automation of production; changing consumer preferences for product and location; increased ethnic diversity; and energy shortages co-existing with climate change. All of these conditions pose new challenges for less populated regions.

At the same time, there is a new set of opportunities, particularly for new and emerging clusters not easily identified by existing industry codes. Improved access to information and markets through digital communications, the convergence among technologies and industries, and a desire among families with children and older populations for a smaller city lifestyle have given rise to new clusters in places able to provide the necessary amenities.

Thus, it's time to reexamine the concept of industry clusters in less populated regions and to explain their new structures and competitive advantages, find out what policies affected them and how, and what impacts they are having on the economy, community, and environment.

A more basic question that was raised at the workshop, however, was: Are clusters fundamental to economic development plans? Would a different economic development approach eliminate the need to detect clusters entirely while also being consistent with the common assertion that the most competitive clusters "self-organize?" Once a cluster becomes large enough to detect with the crude techniques and information at our disposal, Ed Feser pointed out, it already may be well into the process of morphing into a different kind of cluster entirely.

The evolutionary nature of clusters implies that cluster strategies implemented comprehensively and from the top down are more likely to contribute to adverse lock-in effects than promote growth. As Maryanne Feldman,[17] David Wolfe, and others have shown, most clusters are formed by entrepreneurs based on a natural resource, particular local assets, or serendipitous events, and they continue to develop along paths that that are shaped by their past economic activity and expertise. Depending on how the cluster uses its knowledge and skills, this path dependency can become an opportunity to morph into new growth prospects. In some places, for example, innovative farmers were able to shift from commodity agriculture to new clusters through bioagriculture, agritourism, alternative energy, or organic and specialty products.

---

[17] Maryann Feldman and Johanna Francis, "Homegrown Solutions: Fostering Cluster Formation," *Economic Development Quarterly* 18 (2004), 2:127-137.

Resistance to change, however, can lock a region into outdated ideas and a downward spiral.

III. To be or not to be: Clusters in less populated regions

The issue of the identification of clusters in less populated and disadvantaged places raises a number of fundamental questions. It depends on the ability to articulate the characteristics that are typically used to define clusters—the critical mass of similar and complementary firms, geographic proximity, and interdependencies. It also, of course, depends on what is designated as rural. Saxapahaw, a rural community of 1,400 in North Carolina, is an easy commute to Chapel Hill or Durham and part of a thriving metropolitan area. It is quite different than Malta, a slightly larger but much more isolated town in northeastern Montana.

A. What's rural and what isn't?

In order to make sense of rural clusters, we have to assign some sort of parameters to "rural," often called "less populated regions" in Europe, where rural is associated with agriculture. Rural sociologists, geographers, and funders have wrestled for decades with the many distinctions between urban and rural and among the different types of rural communities. Though distinctions are largely subjective, they are important so far as they affect the design and outcomes of interventions. New Yorkers consider Asheville in western North Carolina to be rural even though it is a metropolitan area; Springville, Arizona is far more isolated than Lucedale, Mississippi, even though they have comparable populations.

The share of the U.S. population that is rural ranges from 17 to 49 percent, depending on the definition used.[18] Although the term "rural" refers to the population of a community, almost all national data, and therefore all economic analyses, use the county as the unit of analysis. Andy Isserman has shown that definitions of rural differ significantly from the predominant definition of rural as non-metropolitan, at least in the U.S.[19] Some researchers have further refined the definition by adding levels of urban population or distance from the nearest metropolitan center.

In 1975 Calvin Beale at the U.S. Department of Agriculture, for example, devised a scale with nine different county classifications—six for non-metro counties—that are based on the size of the county's urban population and whether it was adjacent to a metropolitan county. The addition of the classification "micropolitan" in 2003, which includes counties with cities with populations from 10,000 to 49,999, helps further to differentiate the very rural from more urbanized nonmetropolitan counties.

The geographical units used to collect economic data largely determine what is considered rural. Technical difficulties aside, since the companies that comprise clusters generally cross political boundaries, a precise definition is less important than

---

[18] John Cromartie and Shawn Bucholtz, "Defining the 'Rural' in Rural America," *Amber Waves* 6(June, 2008).

[19] Andrew Isserman, Edward Feser, and Drake Warren, "Why some rural communities prosper while others do not," *Report to USDA Rural Development*, Washington, DC: U.S. Department of Agriculture, May 2007.

understanding the effects of diseconomies of scale and distance. Some rural places actually are tightly integrated with metro centers, such that observed local "rural clusters" are more or less satellite production centers for industries or clusters elsewhere.

Regardless of the precise definition, according to almost all measures of well being, places called rural fare worse than places designated urban. While there are some very prosperous rural areas with strong economies, on average rural places have slower population and job growth, less per capita income, a smaller number of educated citizens, fewer patents per capita, and rely more on transfer payments.[20] Rural places also have less access to capital, public transportation, and the Internet. Even so, the designation of rural covers places from Hazard, Kentucky to the ultra-wealthy East Hampton, New York. The Carsey Institute provides a useful taxonomy for distinguishing among rural areas and the types of cluster they develop. This taxonomy includes amenity-rich, declining resource-dependent, chronically poor, and amenity/decline places.[21]

B. What constitutes a cluster and what doesn't?

Assigning a precise set of parameters to the term "cluster" is even more challenging than defining rurality. Although there are many definitions of clusters, most include something on the order of "a *geographically* limited *critical* mass (i.e., sufficient to attract specialized services, resources, and suppliers) of *interdependent* companies. The challenge, of course, is to assign meaningful criteria for defining critical mass, interdependence, and geographic limits.

The definition of a cluster is further complicated by the common use of other terms that apply to some aspect of the definition (*Table 1*). Agglomerations, for example, are geographically bound concentrations of companies without requiring specific interdependencies. Sectors refer to industry classifications but have no geographic limits or value chain interdependencies. Industrial districts are clusters but generally encompass a range of related industries, have more stringent requirements for degrees of concentration, specialization, and geography than do clusters.

The term "cluster" is further clouded by its use as a verb, "to cluster." As a noun, it requires criteria that set it apart from a non-cluster — measures of scale, concentration, and geography. As a verb, however, clustering describes the process of businesses networking with regard to business relationships, not industry classifications. It also can indicate businesses forming a cluster or joining together to aggregate strengths or needs.

---

[20] USDA Economic Research Service, 2008.

[21] Lawrence Hamilton, et al, *Place Matters: Challenges and Opportunities in Four Rural Americas*, Durham, New Hampshire: The Carsey Institute, 2008.

The lack of standard definition for rural clusters, fortunately, has not deterred practitioners from acting on them. Most have applied judgment and a rationale. The U.S. Department of Commerce has endorsed what is in effect the Lake Wobegon criterion, with any group of related firms that are above average—i.e., with an above average concentration—designated as "star" clusters if becoming more specialized or as "mature" clusters" if becoming less specialized.[22]

1. What critical mass is necessary to be considered a cluster?

According to most reasonable measures, requirements for critical mass or scale would seem to rule out almost all clusters in sparsely populated areas. If the criteria are relaxed, then what scale must a cluster have to generate synergies? It may seem surprising that given the large volume of empirical work on agglomeration economies, no one has satisfactorily identified that level of activity that achieves significant economies of scale and synergy among members.

The advantages of agglomeration vary widely by industry, but they also represent a continuum; the larger the scale of demand, the deeper access to specialized services and resources becomes. The critical mass necessary for one type of resource may be less than that for another. A community college may offer specialized programs for a certain cluster, even one lacking sufficient scale, if it can draw students from other regions or industries with overlapping needs. Piedmont Community College in Yanceyville, North Carolina has programs in film and multimedia that draw from the nearby Piedmont Triad and Research Triangle areas.

The number of interdependent enterprises necessary to be considered a cluster depends in part on the size of place and level of market penetration. In less populated areas, smaller numbers of similar companies — such as the 11 houseboat builders around Lake Cumberland, Kentucky that dominate the high-end boat market — constitute a significant local cluster with a very specific product and market. As few as two companies have been designated a recreational transportation equipment cluster in northwest Minnesota. Two large manufacturers employ about 3,200 people in this rural area, use local suppliers, and have a demanding local snowmobiling culture to drive innovation.[23] Thus, for the most part, one knows sufficient critical mass when one sees it or one names it, and a precise definition is not possible—and perhaps not even necessary.

Further, needs for critical mass depend in part on willingness of companies to cooperate. The greater the willingness to cooperate, to intentionally pursue economies of scale, the smaller the numbers of firms needed to have "critical mass." Companies can network, for example, to acquire shared services or resources, all of which might be

---

[22] *Unlocking Rural Competitiveness: The Role of Regional Clusters*, Washington, DC: U.S. Department of Commerce, 2006. http://www.ibrc.indiana.edu/innovation/reports.html.

[23] Lee Munich, Ed., *Knowledge Clusters and Entrepreneurship as Keys to Regional Development*, Minneapolis: University of Minnesota Hubert Humphrey Institute, 2005.

available without cooperation in a region with more companies producing greater demand.

Despite the difficulty, most analyses do in fact set some criteria that must be met to be considered a cluster. But many simply use the term cluster as a way to group, or "cluster," value added sectors according to relationships, with every firm participating in some cluster. The taxonomy developed by the Boston Consulting Group, cited on the U.S. Department of Commerce rural cluster website, considers any grouping with an employment proportion greater than a national average for that set of industries (1.0) to be a cluster, but it differentiates between those experiencing growth ("star" clusters) with those in decline ("mature" clusters). Groupings with proportions less than the national average can be considered either "emerging" clusters if growing or "transforming" clusters if in decline.

Those who use the term cluster to require some level of specialization generally apply one of the following four criteria.

1. The relative proportion of total employment—usually compared to the same proportion nationally.
   A high ratio may be the result of one large employer, which may or may not have a local supply chain.
2. The relative proportion of total establishments—usually compared to the same proportion nationally, the location quotient.
   This is undervalued if the major employers are large, if it omits self employment, and if data are suppressed to ensure confidentiality.
3. The presence of cluster organization that promotes networking, with some minimum number of members.
   This could be a closed and limited purpose network that may or may not be the foundation for a cluster.
4. The presence of some set of specialized assets, such as research or technology centers, often called innovation clusters.
   These are generally linked to research universities or government funded centers and their successes, especially those with international reputations, may not result in local jobs or businesses.

2. What defines interdependence?

The source of interdependence among co-located firms can arise from the similarities of their products; their common need for a possibly scarce, local raw material; the externalities derived from their need for the same set of specialized suppliers and services; their reliance on the same labor pools; or from the value of shared knowledge, either intentionally or unintentionally via knowledge spillovers.

The most common clusters are defined by common products, such as catfish farms in Mississippi, chairs in Udine, Italy, or scotch in Scotland. Northern Alabama's automotive cluster, however, with two large final assembly plants, and Sudbury, Canada's mining clusters are defined by the firms in their supply chains, and Oregon's

wood products cluster by a common dependency on locally sourced lumber. These interdependencies produce the synergy that gives clustered firms a competitive advantage over more isolated firms.

It is not necessarily the case, however, that synergies are always manifested between firms with similar products, processes or resources. One of the great advantages of large cities is that large populations offer the potential for industrial diversification that drives synergies of divergent origins. Conversely, in less populated regions, sources of interdependence can be somewhat more generic, possibly based on the use of certain common platform technologies such as information technologies, on entrepreneurial needs, on certain skill sets, or on common markets. Fairfield, Iowa's technology cluster is based on the use of information technologies, and marine trades in Eastern North Carolina are based on the cluster's access to the sea.

3. What mix of industries or companies constitute a cluster?

In practice, clusters in North America are described by combining sectors as defined by North American Industrial Classification System. The intensity assigned to interdependencies determines the breadth of the cluster and the sectors that define it. Clusters range from very tightly defined—such as men's hosiery in the Catawba Valley of North Carolina or Parmigiano cheese in Reggio Emilia, Italy—to the very broad "business services," "advanced manufacturing," or "agricultural" cluster classifications used by many consultants. A more general title can boost the scale of the clusters but reduces the level of specialization and uniqueness.

An important distinction between a sector and cluster is the range of sectors that are combined. Sectors are aggregated upward within their primary classification. Clusters cut across classifications. The cluster in the panhandle of northern Florida represented by the Technology Coast Manufacturing and Engineering Network includes metals, plastics, electronics, and research businesses. The glue that binds them is that they are all defense contractors and that they serve the needs of—and draw upon—the research at Eglin Air Force Base, Pensacola Naval Station, and the federal labs.

Researchers have tried to establish a common set of clusters that could apply to any place and any situation. The Institute for Strategy and Competitiveness at the Harvard Business School, for example, grouped traded sectors (e.g., sectors that bring new wealth into a region) into 41 clusters, which they found includes 64.2 percent of all rural employment.[24] The project that produced a county level national database of rural clusters for the U.S. Department of Commerce used 17 clusters, but it further subdivided manufacturing into six sub-clusters. The Monitor Group produced data on 20 traded clusters with proprietary compositions in each state for the National Governors' Association.

---

[24] Christian Ketels, Kaia Miller, and Richard Bryden, *Competitiveness in Rural U.S. Regions: Learning and Research Agenda*, Cambridge: Harvard Business School, 2004.

These cluster categories are necessarily very inclusive. For example, the "Advanced Materials Cluster" includes everything from soap and detergent manufacturing to surgical and medical instruments. Obviously, as the number and range of sectors included in the cluster grows larger, interdependencies get weaker, location quotients approach 1.0, and the local or regional branding value of a "cluster" diminishes.

4. How do geographical boundaries denote rural clusters?

Cluster geography, in its loosest sense, is defined by the distance and time that people are willing to travel for employment and that employees and owners of companies consider reasonable for meeting and networking. But geography is influenced by factors such as travel conditions, cultural identity, and personal preferences. In places where people are accustomed to driving long distances, as in the Midwest and Plains states, boundaries can stretch as far as 100 miles. Metal manufacturing companies in western Minnesota and eastern North and South Dakota drive that far to attend meetings of their Tri-State Manufacturing Association. In places where rugged mountains or forests divide towns and travel is slow, as it is in many parts of Appalachia, 15 or 20 miles might be might be the maximum distance that people are willing to regularly travel.

Whatever their boundaries, virtually all clusters include some more distant companies that have special relationships with and are treated by cluster members as "insiders." Political considerations also influence cluster boundaries. Even where clusters spill across political borders, government data are collected by political jurisdictions, and funds must be used within certain jurisdictions.

Among the 50 rural clusters summarized:

- 12 were defined by a community,
- 18 by a county or county and immediately adjacent areas, and
- 20 by a multi-county region.

IV. Describing rural clusters

Rural clusters cannot be forced to fit a formulaic cluster mold. Even if we can answer the questions posed in the previous section about critical mass, interdependencies, and geography, rural clusters would be overlooked. Many have grown as place-based clumps rather than industry-based clusters, with interdependencies based on common skills or resources rather than value chains or products. Others cross official borders, and most encompass large numbers of small and unreported micro-businesses.

Very few rural places that are not embedded in urban regions show up on analysts' "bubble charts" that plot concentration of standardized clusters, scale of activity, and growth rates—that is, apart from the classic and common rural clusters, as verified in the U.S. Department of Commerce's rural cluster database, of agribusiness and food processing, mining, and forest and wood products.[25] Rural clusters require different measurement systems and more creative discovery processes. They also have different social structures and increasingly tighter relationships to large population centers. Identifying them can be like poring over a puzzle in a children's book, searching for common everyday objects hidden within densely illustrated vegetation.

A. Detecting rural clusters

Using standardized data and algorithms to identify rural clusters, their incidence is quite low. Some even contend that the term "rural cluster" is an oxymoron, that less populated regions lack the scale to support such a cluster's existence. Under that interpretation, clusters are not a useful focus of national or state rural development policy, even though they make sense for emphasis in local development policy in the places where they are found.

More often, the problem lies with the data, not cluster criteria. Albert Einstein had a sign hanging in his Princeton office that said, "Not everything that can be counted counts, and not everything that counts can be counted." An excessive dependence on counting, quantitative methodologies, and standardized data make rural clusters seem rarer than they are. Many of the most promising clusters in rural areas cannot be defined by existing industry classification schemes, overlap political jurisdictions, and are dominated by microenterprises and self-employment. Just a few of the "counting" problems include:

- Suppressed data for many sectors in rural counties, in that most states are reluctant to release data that may compromise a company's confidentiality;
- Rigid industry classifications that force companies to chose one category when they may fit many;
- Clusters that overlap county boundaries;

---

[25] *Unlocking Rural Competitiveness: The Role of Regional Clusters*, Washington, DC: U.S. Department of Commerce, 2006. http://www.ibrc.indiana.edu/innovation/reports.html

- Classes of companies common in rural areas but not identified by existing industry codes, such as alternative energy, composite materials, holistic health, and motorsports;
- Reliance on databases drawn from unemployment insurance that omit self-employed workers, a large share of jobs in many rural counties (In North Carolina, half of all those employed by landscape architects, more than two-fifths of those employed by photo studios, and 95 percent of artists, artisans, writers, and performers are self-employed); and
- Use of location quotients to measure employment concentration compared to a national standard—industries may have highly skewed distributions so that clusters can be "below average" yet in the top quintile among all counties.

An alternative, or supplemental, method to the *algorithmic* approach for identifying clusters is the *heuristic* approach. This is not a "seat of the pants" methodology; it relies on observation, case studies, and local experience to discover clusters that are small, bridge political boundaries, or are based on unrecognized businesses or unrecorded interdependencies. It also allows groups of companies with common interests that have developed a collective identity to demonstrate that they have the attributes of a "cluster." Gathering this information requires going into communities and talking to people, the work of what New Zealand's Ifor Ffowcs Williams calls "cluster musters."

Defense contractors clustered in and around Fort Walton Beach, Florida, represent an array of metals, plastics, electronics, and engineering companies that all serve the needs of and draw on the research and technologies of Eglin Air Force Base, Pensacola Naval Station, and the nearby federal labs. The precise number in the cluster is unknown but more than 30 have organized themselves into the Technology Coast Manufacturing and Engineering Network. What unifies them into a cluster is their market and special requirements to bid on military contracts. They self-identified as a cluster in 1990 after learning about how northern Italy's industries cooperate.
Rural Cluster Compendium, pg. 93.

A heuristic approach layered over a data analysis can be used to make modifications to the data that are often are large enough to alter the significance of a cluster. For example, many companies do not use industry classifications that match their relationships to a cluster. Companies with classifications that meet supply chain requirements in an auto cluster may have nothing to do with the auto industry, and vice versa. In the creative enterprise clusters, many glass, leather, and ceramic artists are classified with mass-produced glass, leather, and ceramic manufacturing industries, not as artists, and freelance writers are classified as consultants.

Even careful, heuristic approaches may miss many important but perhaps unorthodox clusters—especially if they represent newly emerging industries that lack classifications or are dominated by freelance, part-time, self-employed, or misclassified workers. The large and growing alternative and complementary health cluster around Asheville, North Carolina; organic agriculture in Vermont; creative enterprises around Sheridan, Wyoming; alternative energy in southwestern Minnesota; heavy lift helicopters in

southern Oregon; maple syrup in Vermont; bison in Montana; and wind energy in Texas are regional clusters that lack industry classifications and defy easy quantification.

Creative enterprises as an economic engine, as distinct from a cultural attraction, include any company for which the primary value of its products or services is rooted in their emotional and aesthetic appeal to the customer. The creative economy includes artists and artisans; digital, media, and graphic arts; architectural, landscape, and graphic design; advertising; interior decorating; fashion apparel; and fine furniture, plus all the sectors that supply, support, reproduce, distribute, and market their products. Some have called the creative cluster a "keystone species" because its impact on a region is disproportionate to its size. It influences overall quality of life, residential desirability, and the area's overall creative and innovative milieu

Green clusters are equally hard to classify and locate. Green companies cluster around their function, which can include environmental conservation, renewable energy, environmental services, or green products, with a special brand that provides a primary value to goods, similar to aesthetics, authenticity, and emotional appeal. Few of these clusters currently have industry classifications that would indicate a green focus. They require special knowledge about place-based economies and local companies.

Table 2 provides one way to distinguish the way that clusters affect their local economy and influence types of interventions. A *cluster of distinction* has established a recognized brand for a place. The sustainability of such clusters depend on their use of local resources and their ability to remain flexible and not locked in to overly narrow characteristics. The recreational vehicle clusters in Oregon and Indiana are facing a challenge of a dramatic drop in demand, worsened by their focus on high-end, energy-consuming products. A *cluster of competence* possesses scale and synergy but is not so dominating that it defines a local economy. The biotech cluster in Montana is important but not a dominating force in the economy. *Clusters of opportunity* represent a chance to intervene early to influence the ways the cluster affects the community and environment. Renewable energy, high-fashion home furnishings, adventure tourism, and specialty foods are emerging clusters that can be planned for sustainability. The ultimate goal is the *cluster in balance*, one that is profitable, expands opportunities, and is sustainable. These types of clusters require maintenance and support but can become the benchmarks that others try to emulate.

The 50 clusters summarized in the Rural Cluster Compendium have the following characteristics.

- 18 are distinctive enough to brand an area. Walla Walla's wineries, Seagrove's potters, Branson's music, Dalton's carpets, and Udine's chairs dominate their local economies and are internationally recognized in the marketplace.
- 25 represent competences but are not strong enough to define a place. Coastal Maine's aquaculture, New Zealand's seafood processing, and the Northern Florida's defense contractors have historic strengths but share the economic spotlight with other strong clusters.

- 7 are opportunities still being developed. Montana's biotechnology, Minnesota's wind energy, and Iowa's renewable fuels are promising opportunities with the attributes of clusters

Table 2: Classes of Clusters

Clusters of Distinction	Quintessential clusters that both define and brand a local economy and particular place.
Clusters of Competence	High concentration of companies, skills, and specialized support but lacking uniqueness and operating within a more diversified regional economy.
Clusters of Opportunity	Seeds of clusters of sufficient size and resources to portend growth, or declining clusters with the foresight and capacity to reinvent themselves.

B. The organization and structure of rural clusters

Clusters have evolved into a variety of forms. Some act as kingdoms, organized hierarchically with large corporations in the drivers seat, dictating standards and prices to subsidiary firms. Others resemble republics, organized horizontally with a large number of firms of varying size, without dominant firms.

Automobile industry clusters have tended to be hierarchical, with large original equipment assembly plants and some first-tier suppliers setting standards and schedules and driving down costs. Wood products clusters, in contrast, tend to be represented by large numbers of smaller companies with diverse customer bases. In all cases—but most emphatically the latter—an organization that represents the members strengthens the cluster's market position and political impact and can provide its members with lower-cost services than they could get individually. Therefore, almost every cluster initiative begins with a "mobilization strategy."

These strategies are often more familiar to rural communities, many of which are more tightly knit and have a history of cooperatives, granges (150-year old rural agricultural education organizations), and farmers' alliances. That doesn't mean rural communities don't have social and economic hierarchies, but there is more likely to be more communication and interaction across strata.

Clusters, in recent years, have become virtually synonymous with membership organizations designated to represent them, whether called councils, associations, partnerships, or networks. These organizations have become powerful voices for their members, mechanisms for engaging industry and aggregating needs and demands, pipelines for information to members and to government, platforms for networking and learning, and, in some cases, pathways of public monies into the cluster. As such, they have become very important to the success of some clusters—if they lead to cooperation and represent a community of interests. In situations, however, where

individual interests gain the upper hand over those of the community, territories differentiate and clusters disintegrate.[26]

Although Arizona and Oregon were the first states to support cluster associations, in other regions associations were forming spontaneously. In some places, the catalyst was isolation from sources of innovation and markets; in others, it was real or perceived external threats to an industry. A small group of metalworking companies in western Minnesota formed the Tri-State Manufacturers Association to discuss common concerns and soon attracted more than 100 member companies, reaching into eastern North and South Dakota, that had similar needs.

The other structural change now underway is in the functions being performed within the cluster. As outsourcing and off-shoring grows, clusters can remain firmly entrenched by concentrating on research, design, logistics, administration, advertising, and other key functions that depend on experienced employees who understand the culture of the cluster. This may confound data-driven analysis, as when Oregon's sports apparel cluster appeared to decline because the industry classification shifted from apparel manufacturing to headquarters.

C. Trust, social capital, and community

Which people and businesses gain and which lose in the economy depends to a large extent on connections, relationships, and trust. These factors affect the exchange of knowledge—about innovations, markets, and job opportunities — and they affect collaboration. The real strength of clusters lies in the tacit knowledge that resides within the employees of companies in the cluster and its dispersion across companies and institutions.

Those companies and those employees who are in the loop have a decided advantage. The Walla Walla Valley Wine association in the state of Washington has increased the willingness of wineries to share equipment and markets and to help fledgling companies. Various evaluations of collaborations conducted in the 1990s all concluded that knowledge sharing was the most highly valued outcome.[27]

Trust is built on a history of reciprocation or upon shared values and interests. "Civic capital," as David Wolfe puts it, "consists of interpersonal networks and solidarity within

---

[26] Peter Maskell and Leila Kebir, *What Qualifies as a Cluster Theory?* DRUID Working Paper No 05-09, Aalborg University, 2005.

[27] Stuart Rosenfeld, "The Social Imperative of Clusters," in Landabaso, Kuklinski, and Roman (Eds), *Europe-Reflections on Social Capital, Innovation, and Regional Development, The Ostuni Consensus*, Recifer Eurofutures Publication Serices, Wyzsa Szkola Biznesu National-Louis University, Poland, 2007.

a community based on shared identity, expectations or goals, and *tied to a specific region or locality*."[28]

Networking and exchange are most likely to occur (a) when price is not the primary basis of competition among firms or (b) when more is better because it creates a brand and attracts more customers. For instance, a rural tourism cluster composed of small bed-and-berakfasts, independent retailers, and local tour guides is more apt to share information and collaborate than one that is dominated by branches of global hotel chains. Hay-on-Wye in Wales became an internationally known book town/cluster with shops that support one another by recruiting competitors to reach a scale that created a reputation and buzz.

The more proprietary and related to a particular market advantage the information is, the stronger the necessary levels of trust. Since companies operate in a competitive environment, they want to hold on to their comparative advantages—until the moment when they perceive greater advantage in unity, cooperation, or reciprocation. North Carolina's hosiery cluster contained firms that were fiercely independent and secretive until the 1980s, when they faced a crisis, realized the value of working together, and formed an association. The firms now proudly proclaim "There are no secrets in our business."

Social capital also influences an individual's employment and advancement opportunities. Employment, promotions, and deal-making all are very dependent on interpersonal relationships and word-of-mouth communications. Most employers, especially in small companies, rely on referrals and recommendations from people they trust rather than taking the time to sift through the massive information available in job banks or employment services.[29] Employees in northeast Mississippi's furniture clusters are constantly changing jobs based on opportunities they hear about from friends and acquaintances.

A high level of social capital alone does not guarantee inclusivity. Not all clusters benefit equally from business associations. Even "open" membership organizations tend to be self-selecting. If members are able to choose to associate, they often pick those they feel most comfortable with, and if power and connections are unevenly distributed, diversity is most important in those social structures that wield the power, influence policy, and have the connections. The European Union "pathways" program to build social capital found that just building stronger relationships within communities of interest or geography was not sufficient without links to the larger power structure.[30]

---

[28] David A. Wolfe and Jens Nelles, "The Role of Civic Capital and Civic Associations in Cluster Policy," in Charlie Karlsson, ed., *Handbook of Research on Innovation and Clusters*, United Kingdom: Edward Elgar, 2008, 374:392.

[29] Robert Reich, *The Future of Success: Working and Living in the New Economy*. New York: Vintage Books, 2000.

[30] Karen Hibbitt, Peris Jones, and Richard Meegan, "Tackling Social Exclusion: The Role of Social Capital in Urban Regeneration on Merseyside—From Mistrust to Trust," *European Planning Studies*, Volume 9 (2, 2001), 141-161.

D. Connections to urban areas

The interdependencies among urban and rural clusters grows stronger as urban sprawl expands into the countryside, large cities draw more of the world's talent, and transportation costs rise. With rural populations in decline nationally, the region is replacing urban and rural areas as targets for public policy. Minnesota, where more than half the population resides in the Twin Cities metro area, views its regions as multiplexes that each include urban and rural areas.

In many ways both urban and rural areas serve as nodes in cluster supply chains. Some clusters have always relied on suppliers in rural areas — initially for commodities, later for lower-cost supplies, and more recently even for highly skilled production work that can be accomplished at a distance. According to the Brookings Institution's metropolitan policy program, "globally competitive major-metro firms depend on small-metro and rural operations."[31]

Even though supply chains are now global, there are advantages to being closer to a supplier in terms of reduced shipping times, greater flexibility, and tighter control. For example, containers typically change hands 17 to 24 times crossing a 7,000 mile supply chain, introducing risks of loss, delivery delays, and bottlenecks.[32] Meyer and Provo write about "farmshoring," in which large cities look to their outlying rural areas for outsourcing as critical links in their value chains.[33]

> "…Lately firms are not just looking overseas, but to low-cost communities in rural areas in the United States. Opportunities in domestic outsourcing or farmshoring are driven by needs like lower costs, data security, skilled and stable labor forces, and geographic constraints. Firms are building the business case for 'going to the farm,' moving different types of work to diverse rural areas."

The growing activities increasingly sent out of the U.S.—such as accounting, data processing, and programming—can be done in rural areas that can offer unique contributions to a company. Virginia has set up such a program, matching companies with rural firms or individuals that can supply needed services.

The flip side of farmshoring may be cityshoring. Some clusters that are centered in rural areas may look to nearby urban areas for sources of capital, research, skilled workers, or specialized supplies. They have the economies of scale to provide business

---

[31] Metropolitan Policy Program, *MetroNation: How U.S. Metropolitan Area Fuel American Prosperity*" Blueprint for American Prosperity, Washington, DC: The Brookings Institution, 2007, p. 35.

[32] Phil Psilos, "Reassessing Firm Benefits of Clustering in Light of Globalization and Offshore Outsourcing," *Sources of Regional Growth in Non-Metro Appalachia: Appendix C: White Papers*, Washington, DC: Appalachian Regional Commission, 2006.

[33] Heike Meyer and John Provo, Farmshoring in Virginia: *Domestic Outsourcing Strategies for Linking Urban and Rural Economies in the Commonwealth of Virginia*, Blacksburg: Virginia Polytechnic Institute, April 2007.

services, entertainment, and retail goods unavailable in smaller communities.[34] In 2000, 51 percent of people living in rural communities were within metropolitan areas.

A potential negative effect of proximity to urban areas is the increased tendency of youth to migrate to cities, especially in the poorest regions. Metro areas have gained college educated youth at the expense of rural areas. Between 1970 and 2000, the Southern and Northern Plains states experienced the highest rates of loss, and within them, non-metro areas adjacent to metro areas fared worst. New England and amenity-rich rural areas proved the exceptions, on average gaining talent.[35]

[34] Metropolitan Policy Program, *MetroNation,*" The Brookings Institution, 2007.
[35] Georganne Artz, "Rural Area Brain Drain: Is it a Reality?" *Choices*, 4th Quarter 2003.

V. Impacts of climate change, globalization, and digitalization on the location, functions, and forms of clusters in rural areas

In the world of clusters circa the 1980s, success depended heavily on developing a collective efficiency in a place in which innovations spread by observation and word of mouth, the public sector was a partner, and relationships were primarily local. While always a somewhat idealized and sanitized version of the real world that encompassed a much larger source of innovation, distant suppliers, and extended relationships, the soul of clusters was nevertheless locally rooted.

Today, globalization is more the rule than the exception. Most competitive clusters have extensive value chains that spread the production functions across countries and continents. These value chains act as sources of knowledge and learning, sometimes on demand depending on the power relationships along the value chain. Those lower in the supply chains are at the mercy of their customers; they meet demands or risk losing orders. Some of the requirements undercut the social outcomes of clusters by reducing labor costs, but others support environmental outcomes by requiring less waste, packaging, or energy use.

Until recently, most of the research that had driven recent cluster strategies was based on a 1980s model of the world economy. The elements that supported clusters in the popular "Porter Diamond" included, among its four corners, "sophisticated local" demand, local suppliers, and local competition (with virtually no value attributed to cooperation). Globalization was widely interpreted in the 1990s to mean taking advantage of new export opportunities to developing nations.[36] Threats to competitive advantage coming from other advanced regions could be overcome with modernization and skill development. Supply chains were assumed to be local or, at the very least, an opportunity to localize and in-fill by recruitment. In the 1980s and early 1990s, China was not even in the picture as an important potential market, much less an economic competitor.

The advantages of clusters were thought to come from externalities derived mainly from reduced transaction costs, based on better access to services, customers, and collective skills and assets. The Italians, however, viewed the advantages of industrial districts somewhat differently, placing a much higher premium on intangible externalities associated with the diffusion of tacit knowledge and networking.

A. Functioning under new conditions

In the 21st Century, clusters operate in a different economic environment. Globalization has taken on a different meaning for clusters and local economies. The market

---

[36] See, for example, William Nothdurft, *Going Global: How Europe Helps Small Firms Export*, Washington, DC: Brookings Institution, 1992.

opportunities are still there, but the threats to employment can no longer be met with new technology and higher productivity. Scores of regions around the world now are able to acquire advanced equipment and have a work force skilled enough to use it. Overnight deliveries combined with the Internet have elongated and extended supply chains. An increasing number of suppliers are global—particularly those that require little face-to-face interaction and whose tasks can be codified and transmitted electronically.[37] Information is accessible and shared on the Web in milliseconds. Technology and capital are highly mobile. Even much of the research and development that Americans once thought was the nation's lasting core strength is being outsourced.

Some of the new influences on rural clusters are competition from less advanced regions; global supply chains and increased functional integration; energy costs and environmental concerns; immigrant workforce and more heterogeneous communities; consumer preferences for product and location; expanding digital communications networks; and new products and emerging markets.

1. Global Competition and Offshoring

One of the main consequences of globalization has been the relocation of many industrial low-added-value activities from advanced economies—often in rural areas—towards even lower-cost regions endowed with cheaper factors of production. In the United States, for instance, this process has caused the decline of many rural areas that had industrialized in the 1950s, 60s, and 70s.

In China each year Datang produces nine billion pairs of socks, Chaozhou makes 510 million wedding and evening gowns, and Shengzhou manufactures 300 million neckties.[38] Just two years ago, it seemed as if American manufacturing competencies would shrivel to specialized niches, high-tech products with large entry barriers, and large bulky products, all somewhat insulated from global competition. Most of the mass production that led to the economic recovery of the rural South, pessimists warned, would be lost for the foreseeable future. Even the production that had moved further south of the border to Mexico was now moving to Asia.

The trend toward moving manufacturing off-shore is shared by many European countries. For instance, the northeastern Italian region of Veneto, which hosts industrial districts in the textile and clothing sectors, has seen massive relocation to Romania, to the symbolic point where the annual meeting of the regional industrial association was held a few years ago in the Romanian city of Timisoara. More recently, however, the ability of low-cost regions to attract investments has not only concerned low-valued-added stages of production, but increasingly also more highly skilled functions. This has been the result of countries such as India not only having cheap unskilled labor but

---

[37] Richard Baldwin, *The Great Unbundling(s),* Brussels: European Union, Prime Minister's Officer, Economic Council of Finland, 2006.

[38] David Barboza, "In Roaring China, Sweaters are West of Socks City." *New York Times*, December 24, 2004.

also a reasonably inexpensive qualified workforce, especially in scientific and technological fields.

Some industries have moved production to low-wage regions but retain certain key functions, such as design, marketing, logistics, administration, and non-routine research. While the total number of jobs decreased—often those jobs that were most likely in to locate in rural areas—large numbers of white collar and transportation jobs remained, which represents a form of global functional integration. The majority of the 20,000-plus jobs at Wal-Mart in northwest Arkansas are in logistics, and Lego retains more than 1,600 jobs out of 4,000 in the city of Billund in central Denmark after having moved its production to Mexico and the Czech Republic.

2. Uncertain energy costs

Cluster advocates failed to foresee the skyrocketing costs of energy. Even though costs dropped precipitously in the last quarter of 2008, concerns about long-term energy supply, about transportation costs that may not reflect the lower fuel prices, and about the potential for global warming are likely to have consequences for rural areas. In June, the *New York Times* reported that "with relatively low wages and high use of pickup trucks and vans, rural families spend up to 13 percent of their income on fuel while the national average is only 4 [percent]."[39] For a while the cost-benefits began to justify bringing some goods back. IKEA announced its first US manufacturing plant, to be located at the interface of declining furniture clusters in rural southern Virginia and North Carolina's Piedmont region. "Shipping IKEA's popular Expedite bookshelves to the United States, for example, costs more than it does to make them," according to Joseph Roth, the company's U.S. public affairs manager.[40]

Food costs also are disproportionately higher for residents living in rural areas. For the average American, food accounts for about 13 percent of household spending, while rural residents spend upwards of 20 percent of their income on food. Long distances to food supplies and a lack of retail alternatives increase the cost of food in rural areas. Rising energy prices simply exacerbate this situation.[41] Those living in rural areas also tend to pay higher prices for electricity due to long distances between population settlements and variations in terrain, which add to transmission costs.[42]

The other impact of the spread of broadband access into rural areas is the opportunity for telecommuting, highly touted in the 1980s but not really feasible before broadband

---

[39] Krauss, Clifford. Rural U.S. Takes Worst Hit as Gas Tops $4 Average. 9 June 2008 http://www.nytimes.com/2008/06/09/business

[40] Ylan Q. Mui, "Ikea Helps a Town Put It Together: Manufacturing Jobs Come Back to Southern Va." *Washington Post,* May 31, 2008. http://www.washingtonpost.com/wp-dyn/content/article/2008/05/30/AR2008053003244.html?nav=emailpage

[41] Food store types; availability and cost of foods in rural environments, *Nutrition Research Newsletter*, December, 2007 http://findarticles.com/p/articles/mi_m0887/is_/ai_n27485588

[42] Freshwater, David, Stephan Goetz, Scott Samson, Jeffrey Stone, Tulin Ozdemir Johansson and Monica Greer. *The Consequences of Changing Electricity Regulations for Rural Communities in Kentucky*, College of Agriculture, University of Kentucky, December 1997.

was accessible and new generation employees began to demand more flexibility. Large corporations like Best Buy have formal policies for flexible working arrangements to keep talented staff. Rural telecommuters, however, will appear on the employment records of the company based on the location of its offices, not where they live and work, undercounting rural employment.

3. Accelerating Digitalization

Clusters once derived much of their value from the ease of communications among employees and owners of companies with similar interests and problems. The café, piazza, and clubroom were where relationships were built, deals made, knowledge transferred, and ideas developed. Today, you see many of these same people alone in cafés wearing headsets, phoning, web surfing, emailing, tweeting, text messaging, or blogging. The technologies are quickly penetrating even poor nations and rural regions. In 2008, three-fourths of the population of North America, three-fifths of Oceania, and almost half of Europe, including children, were Internet users, and more than 3 billion mobile phones were in use.

How has a digitalized world affected the location decisions of companies and the value of clusters? The most obvious effect is that firms need broadband access, and most rural areas today have sufficient access. It's opened new economic possibilities, as illustrated by Lumberton, New Jersey (see inset).[43] But it also changes the nature of relationships and limits access to tacit knowledge. Although early reports of the death of distance have been overstated, and bonding social capital, or strong ties, may be weakened, new generations are using the technologies to expand their weak ties to a much larger and more diverse population.

It may be that even in the 21st Century wired world, "local buzz" keeps ideas flowing and companies innovating. What was once simply "in the air" is just more confined—to cafés, coffee shops, and conference hallways.

E-Commerce Marketing Cluster

Lumberton, New Jersey, a former lumber mill township that has grown to about 12,000 people, is the nation's most active community of eBay buyers and sellers. More than 3,000 people in the Lumberton postal code have e-Bay operations, mostly mom and pop auctioneers not registered as businesses. Starting out as mostly part-time sellers, the profile has shifted to people who make their living on eBay, almost overwhelming the local post office. In recognition of their work, eBay contributed $10,000 to the local animal shelter.

John Beer, "A New Jersey Town Emerges as Hub of e-Commerce," *New York Times*, March 20, 2007.

[43] Jonathan Berr, "A New Jersey Town Emerges as a Hub of E-Commerce," *New York Times*, March 20, 2007.

4. Increasing workforce diversity

The composition of the workforce in less populated areas also is changing. Whereas immigrants once flocked to the cities looking for work, many of the less skilled migrant workers are now coming to less populated areas in much greater numbers hoping to find more stable and consistent work, and they are creating their own communities. These communities are made up of a combination of legal and illegal immigrants with varying levels of English language fluency and very different levels of education, from functional illiteracy to high levels of technical proficiency. It's no longer only Spanish; in addition to Spanish, Minnesota has school districts where more than five percent of their students whose first language is Hmong, Somali, Russian, German, and Chippewa. The new immigrants often separate themselves from the original majority population—sometimes by choice, sometimes by lack of awareness or capacity in communities for outreach, and sometimes due to discriminatory practices.

All of this gives "community" a different meaning. The passing on of tacit knowledge — along with the cohesion (and feuds) that came from long-time family and community relationships and generated various forms of social capital—often excludes the new populations. North Carolina, for example, is in the midst of a battle over whether illegal immigrants should be allowed into degree programs at its community colleges. As of the end of 2008, the official answer was "no."

Immigrant populations also are a source of new entrepreneurs. In the U.S. in 2005, 42 percent of venture capital backed high-tech companies were started by immigrants.[44] Multicultural understanding is a new goal in the workplace and community. Forty percent of the nation's scientists and engineers with PhDs and 35 percent with Master's degrees are foreign-born. Most, however, received their education in the U.S.; fewer than seven percent of immigrants arrive with any post-secondary education. While a small proportion achieve post-graduate degrees, many more end up in rural areas in low-wage jobs with few, if any, benefits and few prospects for advancement. At the same time, rural communities are faced with the problem President Theodore Roosevelt's *Carnegie Commission on Rural Life* identified in 1908—the continual out-migration of the most educated young people from rural areas. While immigrants arrive, the best students leave for college and often don't return, becoming instead part of an increasingly mobile, even international labor pool.

5. Changing preferences for place and product

The values and preferences of both consumers and employees—especially more educated young people—appear to be shifting away from just function to meaning. Larger segments of the population are willing to pay more for products that are more authentic, that reflect values or specific places, or that provide a locally rooted experience. Experience-based products often are connected to a specific place, and

---

[44] Stuart Anderson and Michela Platzer, *American Made: The Impact of Immigrant Entrepreneurs and Professionals on U.S. Competitiveness*, Arlington, VA: Venture Capital Association, 2007.

particularly young, educated people are choosing their work environment carefully, trading off salary for places that provide the kind of cultural and recreational amenities they seek.

Richard Florida contends that "where we live is a central life factor that affects all others—work, education, and love follow."[45] Here, he argues, the world is not flat but spiky, with talent clustering and centralizing in certain—almost exclusively large metropolitan—innovation mega-centers. Rural communities are dismissed as outliers. The terms "rural" and "non-metro" do not even appear in the index. The reason for the bias, of course, is in the measures used: patents, well-educated young people, and levels of post-graduate education. Less populated places do attract talent, but not in concentrations that do not create spikes on a world map, and they can attract innovators, but only if they have a modicum of urban amenities to go with the recreational and natural environments that influence the choices of this newly footloose workforce.

Hosiery in the Catawba Valley: North Carolina's threatened hosiery cluster has been hit hard by pressures from big boxes to cut prices and take back unsold goods and buy new foreign competition from China. The cluster's response has been to move upscale and develop more appealing niche products, such as Thurlo's differentiated action socks or the Vermont "Sock Lady's" mismatched pairs of socks. An association-sponsored trip to similar clusters in Italy (Castel Goffredo) opened their eyes to the potential of design and resulted in changes in their Hosiery Technology Center at the community college to include testing, quality standards, and increased emphasis on expanding design capabilities and markets.

Place also still matters to companies, but for different reasons than in the industrial economy when surplus labor, facilities, taxes, and business climate were the main considerations. Intangible factors such as access to tacit knowledge, experienced workers, sources of design and innovation, opportunities to network and collaborate, and cultural and recreational amenities have become a more important reason for clustering than the tangible factors associated with the proximity of suppliers and customers. Where community cohesion grows out of shared values, towns have been able to reinvent themselves, as New York Mills has done in Minnesota around the arts.

Market preferences also are changing, with a larger share of the population, even in developing countries, choosing to pay more for the aesthetic, emotional, or value-based appeal of a good or experience or for a sense of authenticity that comes from personally knowing the producer or being familiar with the source. Local food markets and farmers' markets, which appeal to a certain niche of consumers, are growing faster than stores with more conventional standardized brands. Crafts and art sales appear to have held up well during the current recession. Prior to the recession, these markets in

[45] Richard Florida, *Who's Your City*, New York: Basic Books, 2008, p. 6.

North America and Europe were bifurcating, with sales up at the low and high ends, causing firms to move up- or down-market to compete.[46]

6. Global warming and sustainability

> "The global demand for energy is increasing at a staggering rate, particularly as growing countries such as India and China develop at an unprecedented pace. The capacity of conventional resources to meet this growing demand for energy is in serious question. The composition of future energy supplies now dominates the international energy discussion, as it is formative of economic security and development. The influence of energy supply on global relations cannot be overemphasized, and the addition of billions of new energy consumers to already strained conventional energy supplies will further exacerbate energy related tensions."[47]

Climate change is affecting rural clusters in two ways. The first, increased regulation, is perceived as a negative effect by many companies that compete on price, because it places greater restrictions to comply with standards, legal requirements, and increases costs. Particularly those who do not believe the scientific evidence of global warming protest, lobby, and look for ways to get around regulations.

The other and much more potent effect is an emergent opportunity to create a new market demand and branding formula for products that are green. A set of new clusters may arise, based on alternative forms of energy such as biofuels, wind and solar, recycling, or restoration. The EnergyXchange in Yancey County, North Carolina, which uses methanol produced by a landfill to power pottery kilns and ovens, represents efforts by a local crafts cluster to conserve its energy requirements. Wood County, West Virginia has 2,710 jobs and three establishments producing components similar to those needed by the solar PV industry.

Grundfos, a rurally based yet global, firm in Jutland, Denmark designed a green ambient pump and lobbied Danish and European Union (EU) legislatures through their respective pump Industry associations for high environmental standards in pump production and pump performance. When the EU later introduced the standard, Grundfos stood ready to market the "A"-grade green pump. The standards negated the cost disadvantage for users.

---

[46] "The disappearing middle market: The urge to scrimp and splurge," *The Economist*, May 20, 2006, p. 68-69.

[47] Amy Glasmeier, *Energizing Appalachia: Global Challenges and the Prospect of a Renewable Future*, Unpublished Paper, Washington, DC: Appalachian Regional Commission, September 2007.

B. Implications for rural clusters

The effects of climate change resulting from increased energy consumption, the impact of the new industrial competencies in previously less developed regions, and the accelerating use of digital communications and the Internet are having a considerable impact on rural clusters in terms of:

1. Increased importance of intangible benefits
2. Convergence among clusters and new interdependencies
3. Importance of being distinctive
4. Changes in sources of competitive advantage
5. Concern about environment and sustainability

1. Re-valuing intangibles

The most important assets of clusters today are intangible, not easily captured by balance sheets or profit and loss statements. Intangible benefits have proven to be stickier than tangible benefits, less susceptible to outsourcing or importing. A region's flow of tacit knowledge and know-how, sharing of innovation, ease of benchmarking leaders and competitors, and experience of the work force are the key factors that determine a cluster's competitiveness. Despite all the technological advances that connect people and move capital across vast distances with instant messaging, virtual relationships, and overnight deliveries, most researchers find that place still matters. They understand that information is not knowledge and that access to information is not learning.[48]

Companies want knowledge and information beyond what they can get from the literature, Internet, and telecommunications, the kind of informal knowledge transmitted by what has come to be known as knowledge spillover or, more colloquially, "local buzz." One of the most important advantages of proximity to companies in similar forms of business, and to suppliers and customers is the ability to pick up bits of knowledge from informal gatherings and casual conversations, to acquire this tacit knowledge that is held in the minds of individuals and the routines of organizations and not easily transmitted through the written word in manuals or articles. [49].

That importance of face-to-face interactions also has influenced access to venture capital. Even though fiber networks crisscross the world the globe has been flattened and national boundaries obliterated. In Silicon Valley, the place that is responsible more than any other for supposedly rendering geography irrelevant, physical distance is

---

[48] Bent-Åke Lundvall, *The University in the Learning Economy*, Danish Research Unit for Industrial Dynamics, DRUID Working Paper No 02-06, Aalborg University, Denmark, 2002.
[49] Kevin Morgan (2001) *The Exaggerated Death of Geography: Localized Learning, Innovation and Uneven Development*, Paper presented at the Future of Innovation Studies Conference, Einhoven University. September 20-23.

very much on the minds of venture capitalists. If a start-up company seeking venture capital is not within a 20-minute drive of the venture firm's offices, it likely will not be funded,[50] a major barrier for rural locations.

"Buzz" sometimes includes unintended but valuable (to the cluster) flows, or leaks, of knowledge among companies. It can happen, for example, by "swapping of employees within a common pool of skilled and technical labor developed around the region's core technology."[51] But companies know they gain more than they lose. One Montana wood products company owner remarked in a focus group that "we used to think we were all enemies…now the best thing about our organizations is learning what someone else is doing and what may be beneficial to you. We still compete, but understand the value of cooperation." **2. Convergence and Interdependencies**

Many of the technologies currently used to define clusters are in fact "platform technologies" that cut across a number of industry clusters. The most obvious are adaptive technologies; information technologies, nanotechnology, and environmental technologies are all critical ingredients of many diverse industries. One reason that it's so difficult to determine the scale of a cluster with industry codes is because the dominance of the technology can be obscured by the end use of the product. A company that creates web-based advertising, for example, is classified as advertising, not information technology.

Green products, in particular, are proving to be highly convergent, as they become a defining characteristic of firms, for example, in architecture, processed foods, building materials, construction, design, and consumer electronics companies. Food processing converges with energy in areas such as biomass, biofuels, and ethanol; pulp and paper converge with biochemistry, bio-refining, and biomass power generation; waste recycling converges with energy, oil, cement, plasterboard, biotechnology, and aquaculture—all in industrial symbiosis clusters.

Convergence gives new meaning to clusters if the common technology, technique, or product characteristic becomes the competitive advantage of the set of firms and the most important connective force. Phil Cooke describes how Kalundborg in Denmark became the first Closed Loop Clty to recycle waste water. The eco-system involves voluntary cooperation among the city and five industrial waste enterprises, a coal fired power station, and major manufacturers including Novo Nordisk, Gyproc wallboard, and a Portland cement factory. Waste from one site becomes an input to another.[52] This kind of urban-rural symbiosis is yet another example of urban-rural interdependency.

---

[50] Randall Stross, "It's Not the People You Know. It's Where You Are," *New York Times*, October 22, 2006.

[51] Peter B. Doeringer and David G. Terkla, (1995) "Business Strategy and Cross-Industry Clusters," *Economic Development Quarterly* 9 (August) 225-237.

[52] Philip Cooke, "New Insights into Socio-Technical," Unpublished paper, Centre for Advanced Studies, Cardiff University & Development Studies, Aalborg University, July 20208.

3. Amenities and place

The economic value of amenities has been recognized for some time. In Europe, it is a central plank of the OECD's program on Territorial Development in Rural Areas. Although this work acknowledges the potential for drawing skilled workers back to rural areas as an added benefit of an amenities-based strategy, the principal focus has been on the valorization of amenities by boosting rural tourism or by connecting place attributes to goods sold in the market through protected designations of origin.

Empirical evidence isolates the role of particular natural amenities in attracting population and talent, but it is much more difficult to measure the importance of cultural amenities. Proxies are poor because a structure such as a museum or a concert hall tells us little about the activity that surrounds it. More importantly, the true value of cultural amenities comes from the interaction they engender within the community. Using concentrations of artists as surrogates for knowing a creative place shows that places with a relative surplus of artists experience faster growth in number of establishments in rural areas.

Much of the evidence for the value of amenities is anecdotal, based on the performance of places that have been able to create the amenities that attract educated young people and businesses. Paducah, Kentucky used traditional incentives to attract artists and establish galleries and theatres revive a depressed part of the city and stimulate the economy. Fairfield, Iowa used bike paths, nature walks, ethnic restaurants, galleries, holistic health centers, and professional organizations that matched the culture of the Maharishi University Business School and its students to attract and retain high-tech entrepreneurs.

4. Changes in sources of competitive advantage

The advantages of rural areas for most of the past half century have been natural resources, land, and low-cost labor. Most rural clusters were based on commodities or value-added production from farming, forests, or mining, or by recruiting branch plants. Those rural areas fortunate enough to have exceptional natural amenities may also have developed clusters around tourism or transportation, and the few that are home to research universities may have developed some form of technology cluster. But for the most part, innovation-based and technology-based clusters have formed in and around urban areas.

The effects of globalization and conservation are altering the rural cluster landscape. Commodities produce and retain too little local wealth, and rural wages are not nearly low enough nor skills high enough to compete with labor for manufacturing in newly developed economies across the Pacific. Efforts to raise wages and to add and keep more wealth in a community countered with the migration offshore of labor intensive businesses, from manufacturing to call centers, have caused rural areas to come up with new competitive advantages and new clusters.

Among the most obvious are those that convert natural rural resources into clean energy, with biomass, biofuels, or wind. These are all high growth sectors with a

tendency to cluster around industry leaders and innovators, companies that produce the equipment, and firms that distribute the energy. Owensboro, Kentucky is making its mark with plant natural foods, organized through the Greater Owensboro Life Science Partnership. Though a small metropolitan area, many of the businesses in the cluster are in fact farmers in surrounding areas.

Another example builds on the growth of the experience economy, with rural areas seeking some distinguishing feature that brands their community or economy and attracts a certain customer base or industry. Western North Carolina has used its Appalachian crafts and music heritage to replace its disappearing industrial base. Fairfield, Iowa attracts business people inclined towards transcendental meditation.

A third is response is to focus on consumption rather than exporting. Economist Ann Markusen argues that consumption is as likely to be an engine of growth as exports. Portland, Oregon's microbrewery cluster began as an experiment for local markets and grew into a major export cluster only after it became so popular locally. "Providing better consumption opportunities locally"—from the arts and culture, according to Markusen—"will then alter the consumption patterns of residents and result in a form of import substitution."[53]

Texas has been the largest producer of wind power in the nation, with the power capacity exceeding 5,300 installed megawatts. The cluster spans 22 counties in the Texas Panhandle, Rolling Plains, Permian Basin, and Texas Mountains. It can trace its roots to 1994 when the first wind farms, Wind Power Partners and Buffalo Gap II, went on line. The state's Renewable Portfolio Standard, which mandated the construction of certain amounts of renewable energy generation, was the catalyst for the cluster. After implementation, Texas wind corporations and utilities invested $1 billion in wind power. The wind turbines have caused some social disruption by pitting farmers against farmers. Some believe that if tax subsidies ends, the communities will be left with thousands of "monsters". To meet hiring demands, Texas State Technical Community College West Texas offers two certificates and one AAS degree in Wind Energy Technology to meet hiring demands. Average industry pay is 2-3 times higher than the local average wage.
Rural Cluster Compendium, pg. 47.

5. Growing concerns about the environment

With mounting and increasingly undeniable evidence of global warming, the private sector and the clusters they represent are beginning to acknowledge the vital need for conservation. Farmers have long understand the importance of conservation and of crop rotation, as well as the consequences of depleting soil nutrients. But minerals and energy were once seen as inexhaustible. The predictions in the 1970s about an impending depletion the world's supply of natural resources proved to be Malthusian,[54] and with energy costs relatively cheap, businesses grew nonchalant about conservation.

---

[53] Ann Markusen, "A Consumption Base Theory of Development: An Application to the Rural Cultural Economy," *Agriculture and Resource Economics Review*, 36 (No. 1, 2007).
[54] Donella Meadows, et al, *The Limits to Growth*, Universe Books, 1972.

But skyrocketing energy prices compounded by shortages—at least for a time—refocused business on the environment. As Tom Friedman writes, "Green is the new Red White, and Blue." A growing number of industry leaders are beginning to realize that conservation is an asset, not a cost. Companies compete for degrees of "green" or smallest "carbon footprints," and major magazines now routinely post their top 10 or 50 green companies. Some of the largest corporations, even those that have had marginal or poor records on many measures of equity, are turning green with massive recycling programs, energy conservation, and packaging reduction policies. In 2007, according to the U.S. Patent and Trademark office, "green" was the single most trademarked term.[55]

Simultaneously, governments are taking actions that are creating opportunities for rural cluster development, and most of it is in rural areas. Iowa, Minnesota, Oregon, and Texas are just a few states laying claim to one or more renewable energy clusters. Most states now have set targets for renewable energy production or use and more than 30 are producing wind-generated electricity. As of 2008, six states already were getting more than a third of their energy from renewable sources.

Recognition of the potential for "green jobs" has led to increased business activity in nearly all states, and despite the ubiquitous nature of the businesses, certain types of businesses do tend to cluster in particular places, associate with one another, and operate as a regional system.

---

[55] Thomas Friedman, *Hot, Flat and Crowded*, New York: Farrar, Straus, and Giroux, 2008. p. 204.

VI. Rural clusters and the triple bottom line

In the 20th Century, clusters were perceived almost exclusively in terms of competitiveness and nearly always "measured" by job growth or retention, economic growth and market share. The actual impact of interventions, often quite small in scale, of course in most cases can only be estimated or declared. The most common acknowledgment of inclusivity was to include raising average wages or generating new jobs with higher than average wages as measures.

In 2004, a group of researchers and practitioners in a Ford Foundation-supported project reexamined clusters more closely in terms of social responsibility and outcomes and concluded that cluster-based development strategies do "not necessarily directly benefit low-income people, small businesses, or distressed regions…Left to their own devices, clusters do not explicitly pursue social goals."[56] Most public sector cluster programs begin by encouraging firms to formally organize, if not already represented by a local or regional business or trade association, and to set their priorities and articulate their needs. What factors or conditions induce the companies in clusters to collectively look beyond their short-term self interests and to assume greater social responsibilities?

The term Corporate Social Responsibility (CSR) is gaining sufficient support that it could be called a "movement," strongest among the world's largest corporations who have the greatest impact on equity and environment and are most concerned about public perception and customer loyalty. This Vermont-based organization has a web site, events, and educational programs. The Harvard Business Review draws a connection from corporate social responsibility to competitive advantage. In 2005, the article states, "360 different CSR-relate shareholder resolutions were filed on issues raging from labor conditions to global warming."[57]

Dow Jones now has a sustainability index that mentions "integrating long-term economic, environmental and social aspects in their business strategies while maintaining global competitiveness and brand reputation" but for the most part it's about business, customer, and labor relations and is aimed at investors, not the public good.[58] Whereas lean manufacturing was the new trademark of successful U.S. businesses, *IndustryWeek* titled its article about the latest Census of U.S. Manufacturers, "Lean Green and Low Cost." They found that 43.6 percent listed environmental management as lone of its strategic practices and 32.8 percent listed energy management, both much higher than in 2006.[59] Without knowing more about the details of the strategies and how they were lowering costs, at least awareness of green manufacturing has spread.

---

[56] Stuart Rosenfeld, *Just Clusters: Strategies that reach more people and places*, Carrboro, NC: Regional Technology Strategies, 2004.

[57] Michael Porter and Mark R. Kramer, "Strategy & Society," *Harvard Business Review*, December 2006.

[58] http://www.sustainability-index.com/07_htmle/sustainability/corpsustainability.html

[59] David Blanchard, "Lean Green and Low Cost," I*ndustryWeek*, October 2007.

Although not always complying out of altruism, companies are responding to stockholder and customer pressures. Some companies and some clusters score high on one dimension of TBL but low on others. Nestle won recent awards for conserving water but rates low on contaminating foods. The logistics cluster in northwest Arkansas anchored by WalMart and Tyson rates high on green issues but low on fair labor practices.

A. Clusters successful in addressing triple bottom line outcomes.

Certain characteristics of clusters have led them to pay attention to the triple bottom line (TBL) outcomes. The most common reasons clusters take on TBL outcomes appear to be due to at least one of the following.

- Defines the objectives of the cluster
- Cluster leadership sets the tone
- Adds an economic value or brand to cluster's products or services
- Assumes a moral responsibility on behalf of community and society
- Overcomes existing or potential shortage of resources or labor

Defines objectives of cluster: The most obvious reason for clusters to focus upon TBL outcomes is when social or environmental objectives define their products or services and generate positive economic outcomes. These clusters derive competitive advantage from how effective or efficient they are in achieving their goals. The clusters that are based on environmental industries—such as companies producing wind energy, providing holistic health, making fair-traded products, or cleaning up the environment—depend on achieving social and/or environmental outcomes. The renewable fuel cluster in northern Iowa and wind energy in various regions of Minnesota are budding clusters that embody, if not specifically articulate, TBL outcomes because their reliance on foreign-born labor requires a more inclusive labor market strategy and and very purpose of the cluster is the impact on the environment.

Cluster leadership sets the tone: Clusters dominated by locally owned businesses are also more likely to address TBL outcomes as a result of community goals and peer pressures. The Italian industrial districts populated by multi-generational family businesses have been more willing to trade off profits for social goods. The small locally owned cheese or wood products clusters in Vermont take environmental responsibilities seriously, as part of their branding.

Economic value of brand: Green and local are product descriptors that attract a certain growing segment of the population that is willing to pay a premium to improve social or environmental conditions. With growing public concern over energy and climate change, companies can get a competitive advantage from products that, for example, are verifiably green, locally sourced, fair-traded, or produced under stringently regulated working conditions. The carpet cluster in Georgia, hosiery clusters in North Carolina and Lombardia, Italy, and furniture in Lahti, Finland are all seeking a green brand that can meet customers' expectations and add value to products. Walla Walla, Washington's wine cluster combines efforts to market local wine and food, and art.

Existing or potential shortage of resources or labor: Other clusters have taken on social responsibilities because it's good business practice. The fisheries cluster in Nelson New Zealand and aquaculture in coastal Maine, both concerned about overfishing and polluted waters, want to be good stewards of the environment. North Carolina's hosiery cluster developed training programs combined with English as a second language, primarily to meet its labor needs from its immigrant Hmong population. The Renewable Energy Marketplace in Southwest Minnesota is developing training programs for Spanish-speaking workers for work in renewable energy clusters.

Moral responsibility to community and society: Finally, there are some businesses that have accepted a social responsibility, even if it does not produce short-term economic outcomes—although most believe that the strength of their improved reputations will ultimately strengthen their business position. What entices companies to put a broader dispersion of wealth or a healthier environment above the pure profit motive? Often it's part and parcel of a chosen lifestyle. The Vermont Environmental Consortium includes not just environmental companies but educational institutions and employers committed to conservation, such as Ben and Jerry's, Chelsea Green Publishing, and Precision Industrial Maintenance. As a result, "green" has permeated nearly all of Vermont's clusters.

The first two categories generally apply to a cluster as an economic entity. The last three may apply to some companies in the cluster but not all. The economic success or failures of the adopters can set the tone for others, leading to imitation or rejection.

Table XX: Characteristics of clusters that meet TBL outcomes

Condition	Examples	Place
Based on TBL sectors	Wind energy Local food chains	Western Texas Southeastern Ohio
Advantage from TBL	Artisan Cheese Furniture	Vermont Lahti, Finland
Strong local commitment	Hosiery Carpets	Central North Carolina Northern Georgia
Socially responsible business leaders	Electronics Aquaculture	Southern Denmark Maine Coast

Source: *Rural Cluster Compendium, 2008.*

Many other clusters have not yet been willing to incur the perceived costs necessary to become green or socially responsible. They still compete on the basis of lowest cost, which translates into keeping labor costs as low as possible and avoiding environmental regulations. For instance, catfish farming in Mississippi, offers jobs in areas of high poverty but also has been accused of taking advantage of low wages and poor working conditions to compete. The cluster now faces competition from Vietnam and is under even greater price pressure. New regulations for labeling country of origin, or for making a distinction between farm-raised or wild, may change buying habits. Similarly, a successful turkey producers cluster of small marginal farmers in Iowa, who in 1996 collectively purchased and now manage their own processing cooperative that today

produces more than 120 million pounds of meat a year, was assessed a penalty by the Environmental Protection Agency in 2001 for polluting the local water.[60]

The largest group of clusters, however, falls somewhere in between, with many clusters assuming responsibilities for TBL outcomes that easily translate into competitive advantage, such as energy conservation and waste reduction or higher wages to attract employees while others, feeling the cost pressures from overseas, cut corners wherever possible.

B. Cluster initiatives that achieve triple bottom line outcomes.

Having established that most cluster initiatives are either about organizing businesses or targeting resources and services, which ones have proven most effective in achieving greater sustainability and social inclusivity within rural economies?

Since no definitively quantitative assessments of the triple bottom line for clusters have been found, the answer is largely subjective, based on assumed or self-reported outcomes. It's difficult to identify economic outcomes that cannot be directly attributed to a specific intervention. Only a few studies have compared urban to rural outcomes, and those have only looked at outcomes at a highly aggregated level, not for specific places and clusters. The Harvard rural cluster study compared macro-outcomes of rural clusters and counties, finding that rural clusters had only 52 percent the average wage, 75 percent of the wage growth, 88 percent the establishment growth, and 35 percent the patents per employee as urban clusters.[61] Using the most basic definitions of clusters, studies in the U.S have shown that places where industries are concentrated perform better on economic outcomes that those that are more diversified.

It should be no surprise that the most successful interventions aimed at social or environmental outcomes have been either

- Initiatives that are supported and/or funded by organizations and agencies organized to address social or environmental issues or
- Clusters for which social or environmental outcomes are critical to their success.

The former includes private foundations and federal and state agencies that target distressed economies or certain marginalized or disadvantaged populations. Many of the interventions are work force training initiatives. These often are carried out by a nonprofit to prepare income and undereducated residents for jobs, often labeled sector strategies. Others are helping disadvantaged populations start new businesses related to the cluster that may be primary or secondary sources of income.

---

[60] Iowa Turkey Growers Cooperative, West Liberty Foods, U.S. Environmental Protection Agency. Docket No CWA-07-2001-0052, CERCLA-07-2002-0009, June 29, 2001.

[61] Christian Ketels, Kaia Miller, and Richard Bryden, *Competitiveness in Rural U.S. Regions: Learning and Research Agenda*, 2004.

The latter includes clusters with labor market shortages that need to expand their work forces, clusters whose products or services are social or environmental, or clusters whose reputation and brand depend on meeting their social and environmental responsibilities. Some of those most successful initiatives are listed below.

1. Organizational initiatives

Networking entrepreneurs: In Iowa, the Fairfield Entrepreneurs Association operates as a network to support the largely information technology related cluster. Formed in 1989, the association helped establish Fairfield as the "Entrepreneurial Capital of Iowa" and led to Fairfield's selection as the 2003 winner of the Grassroots Rural Entrepreneurship Award by the National Center for Small Communities (NCSC). The Entrepreneurial League System that operates in central Louisiana has created a network of entrepreneurs, many of them interdependent, and uses American baseball analogies to coach them and help them move towards the major leagues.

Collaborating on sustainability plans or hiring practices: More and more companies are beginning to hold themselves accountable for sustainability. Dow Jones reports that in 2007, 2,500 companies worldwide published sustainability reports, ten times as many as in 1995.[62] While this may be too difficult or costly for small companies, clusters have the potential for helping their member develop collective reports. Coastal Maine's aquaculture cluster, through the Maine Aquaculture Innovation Center, published a 14-point set of environmental principles for sustainable fisheries. These plans, however, are still exceptions and not common. They generally occur when there is pressure from community or customers to meet or raise standards, and they often rely on help from consultants or nonprofits.

Including nonprofits in the cluster: Nonprofits, in some instances, have been the catalyst for organizing clusters and promoting clustering, or networking. The food-processing cluster in Appalachian Ohio provides a case in point. ACENet, a local nonprofit, organized the growers and small food processing companies, taught entrepreneurial skills, started a kitchen incubator, and helped local people learn how to market their specialty food products as place-based goods that used labels and stories to add to their market value. Another local cluster initiative was started by Sohodojo, a nonprofit organization in Iowa. It organized the Chandler Guild for the scores of soybean wax candle makers and the farmers that raise the soybeans, and published a handbook to help businesses with business and marketing issues. In rural West Virginia, Appalachian by Design aggregated the production of a network of home knitters and provided training, marketing, and design support. Its ultimate goal was to reduce poverty and unemployment.

Changing relationships in value chains: Some interventions are designed to either increase local sourcing of goods or to change the nature of relationships along supply chains so that responsibilities and value added is more evenly shared. Sustainable

---

[62] *American Perspectives*, PricewaterhouseCoopers, 2008, pg. 62.

Food Laboratories in Vermont works in agricultural and food processing clusters to convert their value chains into collaborative entities that produce healthy, sustainable final products for market. Wales, one of the first regions to receive funding to develop a regional innovation strategy from the European Union's Social Fund, chose to develop supply chain associations to improve relationships and develop cooperative training programs.

Developing trails for place-based clusters that also have tourist appeal: The book *Craft Heritage Trails of Western North Carolina*, now in its third edition, maps and describes sources of handmade goods, galleries, and bed-and-breakfasts in western North Carolina. It not only has led to greater sales of local goods but also has increased tourism. Surveys have shown that 94 percent of those taking the recommended wayfinding routes make a purchase, and 70 percent spend more than $100 on craft. The success of the trails has led to a similar garden trail book and spawned imitators across the country in places with high concentrations of arts. The Blue Ridge Music Trail across parts of central Appalachia, Minnesota's Renewing the Countryside cultivated Green Routes, Vermont's marble trail, and Louisiana's Culinary Trail are other examples of path-defined clusters that cross community, and sometimes state, boundaries but operate as a single collective entity.

2. Allocation-based initiatives

Incentives for collaborative behaviors that serve the public interest: Most of the grants made by private foundations are directed to poor or economically distressed rural communities or people. Examples of foundation grants include grants to organize and support cooperation among small companies or self-employed people around food processing in low-income parts of Appalachian Ohio, wood products in the Upper Peninsula of Michigan, after its base closed, and apparel in rural West Virginia. Public sector funds have gone to wine clusters in North Carolina, apparel in the Highlands and Islands of Scotland, and furniture in western Denmark. Minnesota has a grants program called Framework for Integrated Regional Strategies (FIRST) that supports integrated and representative leadership based on cluster boundaries. Four FIRST grants have been for renewable energy in rural Minnesota.

Mining in Sudbury, Canada
Local smelting of the ore releases sulfur into the atmosphere where it combines with water vapor to form sulfuric acid and contributes to acid rain. As a result, Sudbury was for many years considered to be a wasteland. In parts of the city, vegetation was devastated both by acid rain and logging to provide fuel for early smelting techniques. In 1992, however, Sudbury was one of twelve world cities given the Local Government Honors Award at the United Nations Earth Summit for its community-based environmental reclamation strategies. More recently, the city has begun to rehabilitate slag heaps that surround the Copper Cliff smelter area with the planting of grass and trees.
Rural Compendium, p. 45.

Supporting targeted training programs: Given the importance of the labor force to clusters, it's not surprising that many of the interventions have involved educational institutions. Among the 50 rural clusters in the *Rural Cluster Compendium*, 39 are

involved in some type of education or training. Minnesota's State Colleges and Universities (MnSCU) are targeting the state's environmental clusters, developing specialized programs at both Minnesota West and Dakota State Community Colleges and Minnesota State University, under MnSCU's Initiative for Renewable Energy and the Environment. The training was boosted by a $5 million collaborative and industry-driven, multi-county grant from the U.S. Department of Labor's Workforce Investment in Regional Economic Development (WIRED) that targets biofuels and renewable energy. In December 2008, a Green Jobs Workforce and Training Sub-Committee of the state legislature recommended eight-to-twelve-week intensive training programs, dual track certification programs, and apprenticeships. In Oregon, the RV cluster received a grant for a training consortium from the Governor's set aside in the Workforce Investment Act.

Introducing environmental issues in community colleges: Green is quickly working its way into community college curricula and continuing education programs. These institutions are best able to achieve environmental and social outcomes, because they represent the principal path to employment for non-traditional, disadvantaged, immigrant, and unemployed learners, and because their overall mission is to serve the community. By definition, they have social goals and, increasingly, as a result of student and employer demand, environmental goals. Mount Wachusett Community College in Gardner, Massachusetts has a Forest and Wood Products Institute to help companies move to higher-value-added production and to use biomass as an energy source. The college now relies almost entirely on biomass for its energy.

Supporting programs for immigrant and low-income populations: Rural areas, which have had a disproportionate share of low-income populations, are also now attracting the immigrant populations that once migrated principally to America's large cities. Rural residents on average have lower levels of educational attainment than their urban counterparts. In addition, the vast majority (93 percent) of immigrants have no postsecondary education, and many have poor English language skills. The tourism cluster of casinos in Tunica, Mississippi provides opportunities for a very poor African American population, opening up new jobs and career paths. These populations generally need special efforts to help them acquire the skills and, where they are a new minority, become integrated into community life.

Providing capital: Rural clusters generally are underserved by financial markets, in part because of distance from the financial centers and venture capital but also because the type of industries that tend to cluster in rural areas are not in technology-based growth sectors. Local banks have been more apt to respond to needs of rural clusters and, in some places, consider themselves part of the cluster. A Hickory, North Carolina bank officer participates in the hosiery association events and knows the companies in a personal basis. Nonprofits and community development banks have been instrumental in getting capital to rural clusters. Shorebank Enterprise Cascadia provides operating and start-up loans to small businesses and enterprises in the forestry sector that help family-owned businesses stay afloat and help small enterprises develop new markets. Coastal Enterprises, a CDFI in Maine, provides loan products to support the seafood and aquaculture cluster. In its FISHTAG program, fisheries that receive loans must

send data to scientists who then help develop management strategies to insure the long-term health of the cluster.

C. Local circumstances and policies that address triple bottom line outcomes.

The political and social environment, community values, and economic development practices all have major impacts on the degree to which clusters can and do act responsibly toward their community and environment.

The social environment in the region, or degree and type of social capital, often holds the key to realizing TBL outcomes. Cynthia Duncan's study of three poor rural regions found that "lack of trust and cooperation in the community's social climate infects formal and informal relationships at all social levels...Nothing is based on merit, everything depends on whom you know and whom you owe…A clearer understanding of social capital will facilitate efforts to ameliorate persistent poverty and underdevelopment…" Some rural communities have developed a two-tier social system, with those that control the capital holding the power over others. In other places, the inmigration of people from other regions with different values, ideas, and customs have divided communities. Part of the task of a cluster organization is use a shared goal to help different factions reach a common understanding.

For example, economic developers that emphasize industrial recruitment are more likely to want to reduce regulations to make it as easy as possible for industry to operate at the lowest cost ands with fewest restrictions. In these situations, it will take a market demand for TBL outcomes—either from companies being recruited, from the talent they will need to operate, or from the recruitment of green industries.

Communities in which residents are more mobile and there is more churning are less likely to be concerned about long-term effects. Even though rural areas tend to be more stable, the loss of youth to the cities discourages long-term investments.

Politics also is a factor. The more conservative the community, the less likely local businesses may be to assume social responsibilities. In some places, fundamental religious conservatism rejects human responsibility for the environment and climate change. Rural communities, on average, are more politically conservative, although there are major exceptions, especially in amenity-rich areas such as the mountains, coastal areas, and college towns. Even though the more conservative rural communities reject too much government regulation, an increasing number—in some places led by progressive church leaders—will accept voluntary efforts toward sustainability and equity.

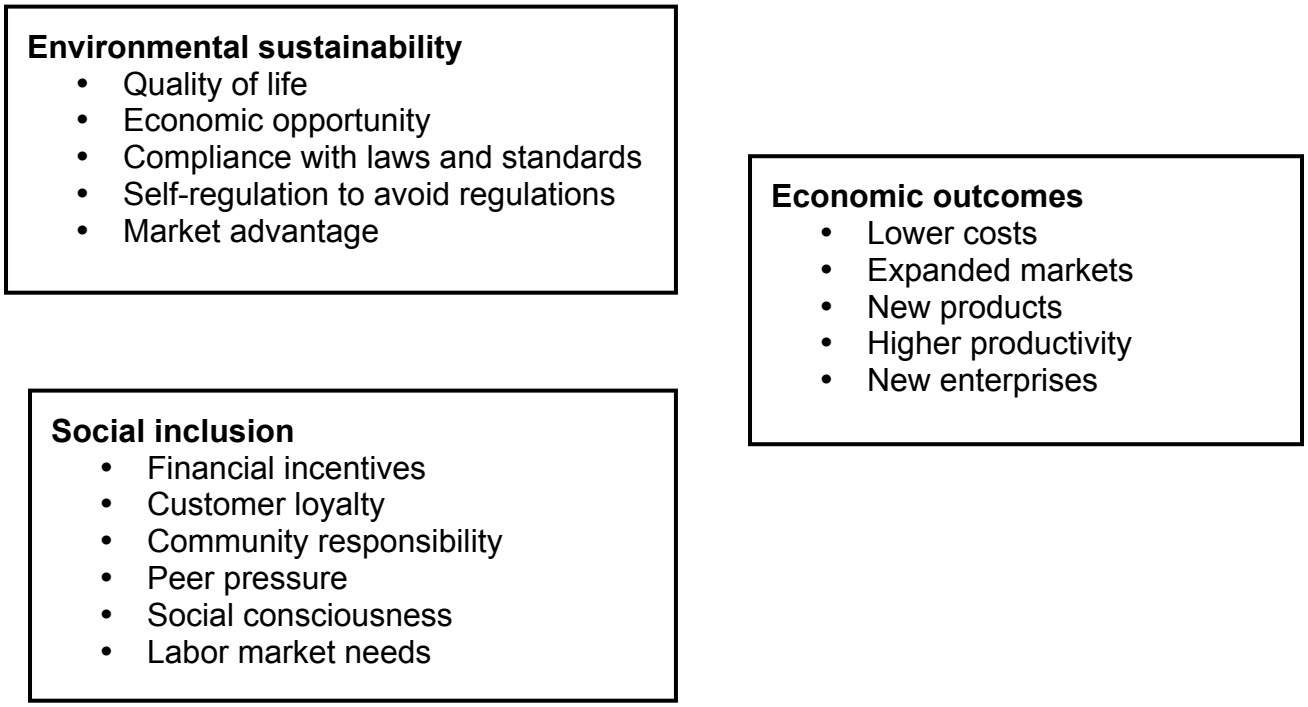
Clustering can raise local consciousness of the value of cooperating in social as well as economic activities. A cluster management organization may come to be seen as the 'honest broker' among firms and communities, distinct from the old, sometimes debilitating ties to established local institutions and organizations.

VII. Recognizing and measuring triple bottom line outcomes

Since clusters can represent a large number of enterprises that have a variety of needs, they often depend on resources and assistance from many different sources. This multiplicity of actions with a wide range of objectives confounds efforts to evaluate the independent impacts of specific interventions—usually retroactively. Moreover, it is even more difficult to gauge the collective impacts of the interventions. Measures of process are usually easier to obtain, such as people trained, investments leveraged, or business contact hours. The best measures of effectiveness usually are estimates that relate intent to very general observed, estimated, or documented outcomes.

Part of the difficulty of measuring the outcomes of cluster initiative is that they are intended either to inspire or offer incentives for other companies to alter their behavior, to act in ways they might not otherwise act in hopes that the value would make the behaviors become habit-forming and common practice. This is particularly true of initiatives to encourage clusters to pursue triple bottom line goals. Examples of outcomes of cluster initiatives that drive the three sets of TBL goals are shown in *Figure 1*. Initiatives that generate new products or lower costs, for example, produce economic outcomes. Those that create market advantage, lead companies to self-regulate, or improve quality of life for family and friends achieve environmental outcomes. Initiatives that offer financial incentives, increase customer loyalty, or address community interests result in social outcomes.

Figure 1: Examples of cluster initiatives that produce each TBL outcome.



In late 2008, FORA, a Danish research agency, produced a Green Paper on international best practices in cluster strategies for the European Union.[63] The report was based on a roundtable held in Copenhagen just days prior to our Burlington, Vermont rural cluster workshop. The resulting publication included a detailed classification of methods that was intended to standardize the cluster process enough to allow benchmarking among regions. These methods covered data collection and outcome analyses of clusters and cluster initiatives that were based on available data focusing on, for example, workforce, establishments, R&D spending, and patents. It also presented information that could be obtained from interviews and surveys of businesses about quality of life, the cultures of competition and collaboration, and government responsiveness–all factors that affect the economy and the business environment. To the extent that environment and inclusivity were considered, each was examined through the regulatory environment (which could have positive or negative effects on the environment), quality of life, and talent attraction.

A. Economic outcomes

Economic outcomes, as described in FORA's Green Paper have been the driving force for support of cluster initiatives by most public sector agencies. These interventions are expected to result in increases in jobs, businesses, investment, incomes, and sales. All of the goals in a survey of more than 250 clusters conducted for The Competitiveness Institute in 2003 were economic. Among the means to achieving those economic ends, however, networking, a social factor, ranked highest.[64] Michael Porter's book, *The Competitive Advantage of Nations,* defined clusters purely as a national or regional economic development strategy, and its progeny in the public sector and consulting world chiefly have focused on competitiveness issues. Porter's recent support for social responsibility frames it in terms of competitiveness and economic outcomes.

Among the three overarching TBL outcomes, economic goals are the most easily verified (with the exception of "jobs retained"), but these outcomes cannot be easily attributed to specific initiatives. Standard data allow the measurement of changes in employment, productivity, and wages for a cluster. Surveys, which are costly and rarely random, can reveal more detailed and nuanced information. But without knowing what might have occurred in the absence of the initiatives or control groups, interpretations of the survey and interview data are based just in what appears to work. The measures most commonly used are shown in Table 3.

---

[63] Emily Wise, Lotte Langkilde, and Marie Degn Bertelsen, *The Use of Data and Analysis as a Tool for Cluster Policy*, Copenhagen, FORA, November 2008. Emily Wise also participated in the Burlington rural cluster workshop.

[64] Örjan Sölvell, Gören Lindquist, and Christian Ketels. *The Cluster Initiative Greenbook.* Barcelona: The Competitiveness Institute, 2003.

Table 3: Measures of economic outcomes from data and/or surveys include:

- Changes in sales across cluster
- Changes in employment
- New investments
- New enterprises started
- Change in average wages
- Changes in aggregate profits
- Evidence of increased competitiveness
- New products
- New markets

B. Social Inclusion and expanded opportunity

Social capital has become a common cluster characteristic and a frequent metric of cluster vitality. Consequently, strategies that support social infrastructure as a means to build social capital, which typically is represented by some type of cluster-specific organization, are among the most popular initiatives. Of the 250 clusters surveyed in 2003, 89 percent included a person designated as "cluster facilitator" to connect the dots representing the members of the cluster. That person could be the key to ensuring that the social structure is inclusive and representative. Under the best of conditions, social capital increases trust and expectations of reciprocity and generally produces behaviors that increase economic efficiency.

Measuring social capital much less genuine inclusivity, however, has proven difficult. Robert Putnam, who popularized the concept of types of social capital in the 1990s,[65] has used 11 proxies that appear to favor smaller cities and older large cities, largely because the method omits informal forms of social capital that characterize younger populations and high tech industries. North and South Dakota, Montana, and Vermont rank highest on his state social capital indices while places that are growing the fastest rank low. Table 4 offers some ideas for measuring the effects of social capital on sustainability and equity.

Table 4
Potential measures of social outcomes include:

- Low income citizens and/or displaced workers trained and employed
- Abundance of jobs with good pay and benefits
- Inclusivity of and diversity within associations
- Accessibility of cluster leadership
- Business support for philanthropy and activities that benefit the community
- Increased networking and evidence of trust

---

[65] Robert Putnam, *Making Democracy Work*, Princeton: Princeton University Press 1994.

C. Environmental outcomes and sustainability

Environmental outcomes are the most recent additions to cluster interventions in the U.S. Until recently, most efforts to achieve sustainability have been informal, based largely on building awareness business by business, community by community, region by region. The arguments for taking action, however, have been mainly rooted in cost savings: reduced liability, reduced costs of materials and manufacturing, reduced waste, reduced energy costs, and fewer regulations. Up until the past few years the environmental movement was predominantly white, middle class, and activist. It was not taken seriously by corporate America and not particularly relevant to the needs and interests of low-income and minority populations.

As the evidence mounts pointing to the likely effects of global warming on future generations and public concern expands, climate change is very rapidly becoming a mainstream concern. Corporations are undertaking sustainability plans, governors are looking at the issue from an economic growth perspective, and marginalized communities are beginning to view "green" solutions as a new opportunity for better jobs.

Clusters provide an opportunity to reach and influence larger numbers of employers and people and to scale up environmental practice. They can use peer pressure in business associations to share responsibility for common problems and to agree on effective practices. Those with large numbers of suppliers can require them, as Wal-Mart has done, to reduce their energy consumption and packaging.

Sustainability also represents a potential to build of new clusters to address environmental problems, such as cleanup, new technologies, green materials, and alternative sources of energy (Table 5).

Table 5: Potential measures of environmental outcomes include:

- Reduction in energy use
- Reduced toxicity of inputs or waste
- Reduced and/or recyclable packaging
- Production of renewable energy for local consumption
- Land stewardship
- Systems thinking
- Reduction of "carbon footprints"
- Industrial ecology—recycling waste
- Firms producing renewables and clean technology for export
- Green institutions for advice, research, and skills

D. Results from the Compendium or Rural Clusters

Based on anecdotal evidence from the 50 rural clusters summarized and our best judgment (since no cluster actually measured non-economic outcomes), Table 6 shows what impacts the cluster or cluster interventions produced. The large number of positive outcomes for expanded opportunity and inclusivity were biased toward international clusters and U.S. clusters with foundation support. The positive environmental outcomes were influenced by cluster that branded themselves as green or local.

Table 6: Summary of outcomes

Type	Positive	Neutral or Unknown	Negative
Economic	50	0	0
Opportunity/Inclusivity	26	18	6
Environmental/sustainability	17	36	7

* This assessment is largely on anecdotal evidence.

VIII. The potential for rural clusters, communities, and people for prosperity and quality of life.

Given what we've learned from our own experiences and those documented and analyzed by others, how can cluster initiatives that, for the most part, have been driven mainly by economic gains, be modified so that they also support inclusivity and sustainability?

The very concept of clusters is at odds with the generally accepted proposition that successful businesses only make decisions that will maximize their profits. Clusters are based on collective and cooperative approaches that balance the interests of the single firm with the greater good of the cluster. Corporate balance sheets often assign a number to "goodwill" an intangible inserted to reflect the real but uncountable value of reputation, brand, and customer loyalty. And it's why so much attention recently has been paid by the business press to holistic measures such as a nation's "gross national happiness" and to various "happiness indices."

Even though companies, like individuals, take monetary gains into account in their business decisions, they rarely choose paths that exclusively maximize their financial gains. Attitudes and values also shape decisions. Most youth, for example, do not choose the educational path to careers that necessarily will earn them the most money, and businesses increasingly make choices about where, how, and with whom to do business that meet needs other than the financial bottom line.

For all these reasons, the time may be propitious to introduce to clusters, and have them taken seriously, outcomes that address social and environmental interests. Some will undoubtedly result in greater profits, but some actually may represent higher costs to the firm yet profit the larger community. We suggest that clusters in rural areas have certain assets upon which to build, liabilities to be overcome, and investment opportunities.

A. Assets

While urban areas seem to hold the right cards and the highest growth clusters, rural areas have decided advantages for certain clusters and people. Some people prefer the lifestyle and amenities associated with smaller cities, and some clusters require the resources or assets of, or simply prefer, a location in less populated areas. For these individuals and clusters, the nature of the experience tells the story. Some of the advantages to which rural clusters can aspire are as follows:

1. *Natural resources*: Rural areas, being more dependent on their natural resources, are more apt to want to preserve and sustain them. The most egregious depletion often occurs when such resources are not locally owned, a fact made obvious in the impact of strip-mining in Appalachia, clear-cutting forests for lumber, or over-fishing, all of which can result in long-term environmental degradation.

2. *Community colleges*: Community colleges have become critical resources for rural clusters. They are valued as accessible and affordable sources of postsecondary education, for their worker and management training and technical expertise, and as community centers. The colleges play crucial roles in many rural clusters, either as a response to business demand, as Itawamba Community college responded to Mississippi's furniture industry and Catawba Valley Community College responded to the hosiery cluster, or as a catalyst to help shape a cluster, as West Minnesota Community College is to the wind energy industry, Gadsden Community College's Advanced Manufacturing Centers is to Alabama's automotive cluster, and EUC-Syd is to Sønderborg's electronics cluster.

3. *Distinctiveness and sense of place*: Small communities, which lack the scale of amenities that cities can provide, have more reason to find a distinguishing brand that sets them apart from other places. In Galax, Virginia and in Mountain View, Arkansas, this distinctiveness derives from traditional music; in Fairfield, Iowa, it's transcendental meditation; and in Husavik, Iceland, it's whale watching. Each is a result of specialized assets that also represent a wellspring for a rural cluster.

4. *Closer relationship to land and environment*: Rural people are more apt to have some sort of direct relationship with the land, either because it's the source of their income or that of their relatives or friends, or because they simply are more aware of its inherent power. A direct relationship with the land provides obvious opportunities in traditional resource-based businesses, and this fact applies even with regard to new technologies. Wind farms, for example, seem to be more efficient as communities—or clusters—of small farm-based units, with several small installations making better use of wind power than one large installation.[66]

5. *Gemeinschaft*: Relationships are more important in rural communities, where individuals appear to be just as oriented to large associations as they are to their own self-interests. The long-time traditions of the Grange and cooperatives have established a community-based tradition of shared responsibility that still exists in many rural communities. That's chiefly why business network initiatives have been disproportionately applied to and successful in small cities and rural areas.

6. *Relationships to urban* areas: With expanding urbanization, more of rural America, or rural Europe, finds itself within an easy drive of a metropolitan area but with certain advantages in land availability, costs, and lifestyle. This could enable an urban cluster to develop a rural satellite, as did North Carolina's hosiery cluster in Randolph County, to employ people who may be able to work at a distance most of the week. Urban clusters also may extend their boundaries to include more distant firms.

---

[66] Joe Provey, "Building Wind Communities: Why Small Might be Better." *E Magazine*. 20 (January-February), 32:33.

7. *Lower costs*: When applied to the individual, lower costs can mean more value for the dollar; when applied to a cluster, it can mean low wages and poor benefits. Low costs have been used for decades to attract businesses to rural areas on the assumption that low-wage work is better than lower incomes and subsistence living, and clusters have formed around these labor markets. Wage growth has happened through entrepreneurship or through education and transition into higher skilled occupations and higher wage clusters.

8. *Increasing social responsibility*: There does appear to be a change in the mindset of a growing number of businesses, in part driven by the business press and some progressive CEOs. In 2005, a leading North Carolina business magazine, in an issue devoted to "green," wrote that "the integrated approach to sustainability has led to a new bottom line for business leaders to consider: The triple bottom line, which looks at business returns [and] shareholder value as well as the health of the environment and communities."[67] A set of business champions for triple bottom line goals may be able to influence clusters in ways that nonprofits and governments cannot.

B. Liabilities

The following conditions are generally liabilities to enabling clusters in less populated areas to achieve triple bottom line outcomes.

1. *Scale*: Less populated regions, even where industries cluster, have smaller numbers to offset fixed costs. It is more difficult to reach critical mass that attracts specialized services without significantly extending the cluster boundaries.

2. *Outmigration of youth*: The brain drain of young people from rural areas is nothing new and is unlikely to change, especially as levels of educational attainment rise and youth who feel their opportunities are limited locally increasingly are able to test other locations. Most rural places will have to concede the loss of large numbers of their brightest youth and concentrate on attracting them back as they begin to raise families. Rural communities also may need to find replacements among immigrants and dissatisfied urban dwellers.

3. *External ownership of resources*: The consequences of external or absentee ownership are well known in rural areas, visible in the obliterated mountaintops of West Virginia or the boarded-up manufacturing plants in South Carolina. It is difficult to create the same degree of responsibility toward the community and its environment from the absentee landlord as from the second- or third-generation local owner who attended the local schools.

---

[67] Thomas Beam,"Sustainability: Business Practices to Meet the Challenges of the 21st Century," *Business Leader, 17 (*November 2005).

4. *Distrust of newcomers*: The same more stable and homogeneous nature of rural communities that creates gemeinschaft, also makes it more difficult for outsiders to be accepted. Many rural communities experience some form of the "town and gown" divisions that often split college towns. Such strife worsened in the 1970s, when the counterculture migrated from cities to rural areas; in many locales, a residue of distrust from those conflicts still persists. In other places, it's the newer immigrants who must win the trust of earlier generations of immigrants who are now settled in as the resident population.

5. *Preoccupation with megapolitan regions*: The rise of the knowledge economy has been accompanied by a shift in attention from the public sector to large urban areas, perceived to be the sources of innovation, at least when measured by patents per capita, and magnets for talent. As traditional manufacturing continues to decline, attention to rural areas reverts to its natural resource and agricultural base.[68] The January 2009 special issue of *Newsweek*, authored by staff of the Brookings Institution's Metropolitan Program, highlights these urbanization patterns. States appear to be preoccupied with research-driven clusters, with the exception of renewable energy.

6. *Political conservatism*: Rural areas are more likely to be "red" and cities, "blue." Political conservatism, even where populist, has a basic distrust of big government and regulations as well as big business. Concern for the environment can be limited when it competes with earning a living, as in Oregon where loggers fought efforts to save the spotted owl,[69] and across the West, where the wood products industry opposed efforts to conserve old-growth forests.

7. *Regional insularity*: The most successful clusters include at least a few "lead" firms that are part of global networks and thus exposed to global market opportunities and best practices. These firms regularly benchmark themselves against the best practices anywhere, including those companies and clusters that are pursuing sustainability. Because knowledge comes from very diverse sources, the wider that communities cast the net, the more likely they will find good ideas. But poor regions and small companies all too often have limited access to these benchmark practices, innovations, and markets. Without wider access, companies are limited to learning only within their regional borders.

---

[68] Robert Lang and Dawn Dhavale, Beyond Megalopolis: *Exploring America's New "Megapolitan" Geography*, Metropolitan Institute Census Report, Blacksburg: Virginia Tech, 2005.

[69] Bill Bishop, *The Big Sort*," New York: Houghton Mifflin, 2008.

C. Investments that are needed

Although rural clusters can do much on their own initiative, external investments are often needed to bring about substantive changes in behavior and outcomes—especially in weak economies. Hosiery companies in western North Carolina and the Metalworking Connection in Arkansas both used the political clout they were able to muster through cooperation and building an association to acquire specialized services from their state legislatures that previously had been beyond their reach. The small and mid-sized enterprises and communities that dominate rural clusters need help if they are to be expected to take on new responsibilities that they may view as economic risks.

1. *Amenities*: In the competition for talent and growth industries amenities, as demonstrated in the research of David McGranahan and Tim Wojan, are more important than ever before. Communities are beginning to recognize that a historic and distinctive downtown is more important than a big box retailer to potential investors and residents. Sheridan, Wyoming has restored the architecture of its Main Street, proudly displaying fully restored version of the original Penny's Store, Mint Bar, saddle shops, Buffalo Bill's home, and art deco Wyo Theater. A few states, like Maine and Vermont, that have resisted the big box stores, are investing heavily in rural communities. Others, however, are just beginning to pay attention to the value of place.

2. *Education and Training*: The most obvious, and easiest investments to justify are for workforce skills development. Lack of education has always been seen as a reason for low incomes in rural areas, while more education has been viewed as the salvation for rural economies. The same holds for rural clusters. Virtually all clusters request some form of initiative aimed at the workforce, but most such efforts lack sufficient scale to have the desired effect. The need for additional education and training resources is greatest in places that have had a history of low educational attainment and with large immigrant populations. Community colleges and universities that offer effective education and training provide new opportunity while also addressing the need for a skilled workforce. In addition, despite decades of efforts to equalize educational expenditures, spending on rural children still lags behind spending in urban schools.

3. *Cluster initiatives directed at supporting triple bottom line outcomes*: Existing cluster-based services, where they exist, are quite traditional, focusing on technology, business, and training. Except in those instances where the cluster itself addresses the environment, there are few cluster initiatives that address either equity or environmental issues. In some places, it will be up to community-based organizations to fill the gap, but they'll need support to encourage businesses to take risks associated with new approaches to achieve TBL outcomes.

4. *Technical and business assistance*: Less populated areas are less likely to be served by the government or private services that depend on scale for their sustainability. They may get occasional visits by extension agents but do not yet

receive the same level of services that cities get. One of the most effective sources for clusters in rural areas is the community college, which in many states strive to offer cluster-specific services

5. *Venture and working capital*: If rural clusters are to grow, they will need ready access to start-up and operating capital. The availability of both types depends on the presence of financial institutions that are specifically geared towards serving the needs of lower-wealth regions. Community Development Financial Institutions (CDFIs) are able to offer smaller amounts of working capital loans that can have dramatic impacts on small businesses capacity to continue operations, but they lack the volume to serve the capital needs of rural areas that are necessary for a rural cluster to grow.

6. *Eco-services*: Climate change policy is raising the value of eco-services for preserving natural capital and ensuring the sustainable flows of services. It highlights how the lack of market price for these services presents a valuation challenge for implementing policy. Substantial progress has been made in developing methods to assign value to methods for allocating various tax credits, and conservation incentives for carbon sequestration, ecosystem investments for climate change mitigation, sustainable energy development, and other economic processes. Eco-services also are a potential cluster in rural areas, which are repositories for the natural systems from which the stocks and flows of vital ecological services reach the economy. In 1994, for example, an environmental technology cluster was born in Oak Ridge when networks of companies organized to clean up the formidable radioactive and other hazardous waste created by the Oak Ridge Laboratories. The cluster included the environmental technology companies, sources of capital, lawyers, and accountants.[70]

7. *Opportunities to benchmark and partner*: Rural communities need resources to overcome isolation barriers, to be able to observe benchmark companies and clusters, find new markets, hear about new ideas, observe how other place are addressing issues like the environment and social inclusion, and build working partnerships with other similar clusters. The practices of clusters that have had the opportunity to travel internationally have been dramatically affected. For example, Kentucky's equine cluster has been able to build connections to similar clusters in Scone, Australia and Newmarket, United Kingdom.

---

[70] Pat Dusenbury, "Beating Swords into Plowshares," *Firm Connections*, Regional Technology Strategies, 5 (No 1. 1997).

IX. What next?

This paper really addresses two questions. First, are industry clusters still relevant to the growth of rural economies in a global and digitally connected economy? Second, are clusters an effective medium for also addressing social and environmental issues?

The first question requires weighing the benefits of specialization against diversification and examining why people and companies choose rural areas. While most regions are able to find a compromise between specialization and diversification by claiming or establishing multiple clusters, the most successful clusters are those sufficiently dominant to establish a strong local or regional brand. The recent decline of strong recreational vehicle clusters in Indiana and southern Oregon demonstrates the danger of high degrees of specialization. These particular clusters, however, are dominated by a small number of large employers. Most rural clusters have more diversified markets with larger numbers of small firms that, if they have the foresight, are able to shift into new lines and markets.

The second reason for relevance is that rural areas still attract certain types of businesses. In the early 1980s, journalist and author Joel Garreau noticed in the Ozarks that even the "lack of progress was an enormous attraction to retirees, from the cities that ring the mountains, young people who, fancying themselves "homesteaders,' wished to apply their urban educations to the problems of going "back to the land," and light industries that could locate anywhere there was an interstate highway and a WATS line."[71] And that was long before the Internet vastly expanded business rural opportunities! The growth of the "experience economy also is accelerating interest in places that can provide special experiences.

While high-growth companies and clusters appear to favor cities—comparatively speaking, based on the raw numbers—an increasing number of small and mid-sized firms actually are leaving urban areas for lower costs and different lifestyles. The *Economist* called the exodus of high-tech companies to the central mountain states the "Californication of the Rockies." This trend contributed to the formation of a nucleus of Montana's biotechnology cluster, which may be small by national standards but it is very significant with respect to the state's economy. Those places with sufficient amenities—or with some special resource or well-established market niche—can and do attract businesses that find and value interdependencies. New residents also bring new ideas, connections, and sometimes renewed or different values to existing clusters.

Finally, clusters are still growth models but under different conditions. Communities and counties have to think—and organize—regionally but act globally. With much easier access to information and people, the balance of interdependencies shifts from traded

---

[71] Joel Garreau, *The Nine Nations of North America*, New Boston: Houghton-Mifflin, 1981.

to untraded transactions. The functions that unify clusters may be as abstract as common values, which are part of a common identity.[72]

The second question is more complicated because the desired outcomes—wealth, inclusivity and sustainability—do not always go hand-in-hand. Many of the most stable and economically successful rural clusters, whether mining, fisheries, or textiles, brought low-wage work and did little to improve skill levels and economic opportunities. Overdependence on natural resources, primary industries, and branch plants—all of which pay relatively low wages—has led to wealth being drained from rural communities and diverted either to others farther up the value chain or to external owners.

Even the new green clusters don't guarantee good jobs, significantly improved economic opportunities,[73] or the best use of farmland. Regarding wind power turbines dotting the landscape, the emergent cluster may not preserve scenic beauty. Where social and environmental outcomes do become integrated, it's usually due to a set of core overlapping values. Places concerned about the environment often are concerned about social issues and equity, and vice versa.

Both social and environmental policies can be driven by the private sector, through responsibility; by the public sector, through incentives; or non-profits, through support. The sector strategies supported by private foundations through non-profits have given disadvantaged populations entry into career paths in certain clusters. Inclusivity is most common where there are labor market shortages that can only be met by extending opportunities to new populations. Over the past decade, construction, landscaping, large-scale agriculture, and factories have depended on immigrant labor.

The fastest growing opportunities, however, are in clusters representing renewable energy, energy efficiency, and environmental clean-up opportunities. Nearly every state is looking to green businesses and jobs as major sources of new growth. One study—conducted for a professional industry organization—estimated that these industries represented almost four million jobs in 2007.[74] A large portion of the businesses will be in rural areas and, based on recent experiences, will certainly cluster. Clusters are developing around wind farms in parts of Texas, Colorado, Montana, and northern California; biofuels are booming in selected regions of Minnesota and Iowa; forestry-based biomass in central Massachusetts; and there is an emerging Solar Valley in Saxony-Anhalt, Germany. In Wyoming, there are eight wind associations—many of

---

[72] Michael Russo and Jennifer Irwin, *Sustainable Values and Behavior: Familiarity and Local Purchasing in the Portland Sustainability Cluste*r, Portland: The Competitiveness Institute annual conference paper, September 2007.

[73] Phillip Mattera, et al, *High Road or Low Road: Job Quality in the New Green Economy,* Washington, DC: Good Jobs First, February 2009.

[74] Roger Bezdek, *Green Collar Jobs in the U.S. and Colorado: Economic Drivers for the 21st Century*, American Solar Energy Society, www.ases.org, January 2009.

them cooperatives—that are nudging the ranching culture of independence and self-reliance toward ongoing collaboration.[75]

Most clusters are not yet thinking about triple bottom line outcomes. When that does happen, it's almost always the result of a market opportunity, not social responsibility. To move clusters in the direction of TBL outcomes, it will take information, assistance, incentives, and persuasion.

One of the keys to adapting to a changing world in less populated and accepting new challenges and responsibilities is the nation's community college systems. These institutions are close to their communities, accessible and open to new populations, and responsive to economic opportunities and social barriers. In the past, community colleges have played lead roles in rural development, particularly in networks, clusters, and industrial modernization and, based on evidence over the past few years, moving quickly into the environmental arena.

For most clusters, moving forward will be a balancing act, weighing their anticipated long-term against short-term income, individual versus community interests, sourcing local versus shopping lowest price, hiring workers who look alike or are different, and using renewable or consumable resources. Most clusters will take small steps, with guidance, in the right direction.

---

[75] Felicity Barringer, "A Land Rush in Wyoming Spurred by Wind Power," *New York Times*, November 28, 2008.