

A Compendium of Clusters in Less Populated Places

Circumstances, Interventions, and Outcomes



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Regional Technology Strategies, Inc.

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This project is part of a larger set of strategies for “Wealth Creation in Rural Communities”
With support from the Ford Foundation



**Wealth Creation in
Rural Communities**

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Clockwise from upper lefthand corner, heavy-lift helicopter cluster in southern Oregon, courtesy of Erikson Air-crane; wind turbine cluster in southeastern Minnesota, Dodge Center, courtesy of Burke Murphy; Walla Walla Community College's Center for Enology & Viticulture, courtesy of Walla Walla Community College; leather cluster in Sheridan Wyoming, King's Saddlery, courtesy of Stuart Roenfeld; hosiery cluster in Hickory, North Carolina, courtesy of the Manufacturing Solutions Center at Catawba Community College.

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Format for Cluster Summaries

Although the information used to compile this data set of rural cluster is drawn from a wide variety of sources over a long period of time, we have attempted to describe each in a roughly similar format. Efforts were made to update, using Internet searches and phone calls, those clusters that were based on older information.

Each vignette begins with a **description** of the approximate scope and scale of the cluster, focusing on the types and numbers of firms within the general cluster boundaries and along its local value chain.

The **origin** of each is traced to learn when and how it started and grew.

The **location** and general boundaries of the territory associated with the cluster.

If the cluster has a particular **associational infrastructure**, it is described in terms of its purpose, membership, and leadership.

The **development** of the cluster is based on the context and conditions that prompted or helped the clusters mature. For example, we investigated whether the cluster was part of a larger public sector, a specific local government strategy, a strategy of a foundation or other external source of funding, or purely business led. We also looked at special conditions that aided the development of the cluster, such as special investments in research or

recruitment, labor market skills, or pure serendipity. Based on best available knowledge, what **external interventions** or forms of support have been directed to the cluster and from what sources? This is presented in matrix form, with sources differentiated by regional or state government, national government, public education, foundations, or other sources. The types of services are those that have seemed to be most prevalent: Networking, education and training, business services including entrepreneurial services, R&D or technology diffusion, marketing and capital, and infrastructure.

Community engagement describes ways that communities are involved with clusters or can influence their practices. Since clusters are by definition private-sector-driven entities, community engagement must be by invitation or they have to bring certain resource to the table.

The **outcomes** represent the most ambitious piece of the story and represents an initial effort to determine if and why firms in a cluster aspire to or achieve the triple bottom lines—positive and substantial economic outcomes, expanded opportunities, and environmental impacts. Since almost no clusters began with a triple bottom line in mind, such outcomes likely developed over time in response to conditions, pressures, or incentives.

Sources of information are listed at the end.

Glossary of Terms Used

Associational Infrastructure: The economic, social, or civic organizations, institutions, and venues that enable employers, employees, or artisans to come together, build trust, develop relationships, learn from one another, and form networks or consortia.

Cluster: A geographically limited critical mass (i.e., sufficient to attract specialized services, resources, and suppliers) of companies that have some type of relationship to one another—generally complementary or similar products, processes, or resources.

Clustering: The act of companies with similar interests or needs in a geographic region establishing new or closer relationships and linkages.

Cluster Initiative or Intervention: An activity that addresses the specialized needs of a set of companies or the entire cluster designed to enhance the competitiveness of the cluster.

Cluster Associations: A membership-based organization that collectively represents the needs and interests of members, provides services, and/or serves as a vehicle for members to associate and network.

Community: A loose definition that is generally defined by political boundaries or shared interests but in this compendium refers to a single or set of municipal boundaries.

Development: In this report, development refers to any special conditions that may have prompted the formation and further development of the cluster and the larger political and economic environment of the cluster, as for example, a public sector or foundation strategy, an independent, grass roots effort, or purely an entrepreneurial outcome

Economies of Scale: Reductions in costs that result from increases in the scale of demand for valued services or resources. These economies are often discussed as "localization economies," which are the benefits that accrue to firms as a result of the clustering of similar firms, and "urbanization economies," which are benefits that are associated with population density.

Innovation: The transformation of knowledge into new products, processes, and services; the act of using something new. The innovation process consists of the steps through which something that is used moves from conceptualization to utilization.

Knowledge Clusters: Specialized networks of innovative interrelated firms that derive competitive advantages through accumulated, embedded, and imported knowledge among local actors about highly specific technologies, processes, and/or markets.

Location Quotient: The ratio of the relative concentration of establishments or employees in a cluster to total establishments or employees in the economy divided by the same relative concentration in the larger economy (state or nation). A location quotient of 1.0 represents average concentration, a quotient of greater than 1.0 a higher concentration, and a quotient of less than 1.0, a smaller concentration.

Network (formal): A contractual alliance or membership organization in which some number of firms agree to share resources, costs, or information. Some form of cooperation and some level of trust are required. Networks are often, but not necessarily, embedded in clusters.

Networking (informal): Informal interactions and relationships among firms and support organizations that are not contractual or membership based. They imply something more than simple proximity to like or related firms and deliver more than external economies.

Network Broker: An individual or organization that facilitates joint actions among groups of companies.

Region: A geographically bounded territory that has a common hub, labor market, or source of economic growth.

Sector Programs: Workforce development programs run by non-profit organizations that address the needs of workers and employers in specific groups of industries.

Social Capital: Stocks of social trust, norms and networks that people can draw upon to solve common problems. Networks of civic engagement, such as business and neighborhood associations and cooperatives are an essential form of social capital, and the denser these networks, the more likely it is that members of a cluster will cooperate for mutual benefit.

Soft Network: A group of companies that has some core competency, resource, or need in common that choose to form a local or regional association that enables them to share costs of services and information, interact, and/or influence policy.

Supply or Value Chains: All of the companies in the production stream that make the individual systems, parts, and services that eventually are incorporated into a final product purchased by an end customer or user.

Triple Bottom Line: Three sets of outcomes that are measured by (1) economic impacts, (2) expanded opportunity and (3) environmental impacts.

Summary of Cluster Characteristics

Based on the available information and, in some cases, inferences, the following characteristics appear to describe the 50 clusters.

A. Geography

Northeast	4	8%
Midwest	7	14%
South	13	26%
West	9	18%
International	17	34%

B. Geographic boundaries

Community	12	24%
County & immediately adjacent areas	18	36%
Region or multi-county area	20	40%

C. Industry type

Aquaculture/agriculture	7	14%
Creative	6	12%
Tourism/culture	3	6%
Energy/environment	5	10%
Wood products	7	14%
Durable goods	8	16%
Technology	5	10%
Textiles/apparel	5	10%
Transportation equipment	4	8%

D. Type of cluster

Distinction	18	36%
Competence	25	50%
Opportunity	7	14%

E. Origin of cluster A

Single firm	22	44%
Skill sets	14	28%
Natural resource	9	18%
Technology or innovation*	13	26%

* May overlap other categories

F. Origin of cluster B

Industrial recruitment	6	12%
Homegrown firms	40	80%
Government strategies	4	8%

G. Types of Interventions identified

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

H. Association

Formal association	22	44%
Informal/collaborative	24	48%
Mainly competitive	4	8%

I. 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 since no cluster actually measured non-economic outcomes.

AGRICULTURE/AQUACULTURE

1. Cheese Artisans in Vermont

Description

Vermont is renowned for its award-winning cheddar cheeses. A host of smaller, artisan cheese makers are today broadening Vermont’s reputation as a place for world-class, gourmet cheese, 35 featured on the Vermont Cheese Trail, a statewide wayfinding trail that promotes these producers and their 150 varieties of handcrafted cheeses to tourists. These producers make their cheeses from raw, unpasteurized milk, and some also use traditional techniques to age their cheeses. Many of them depend on networks of small farms. Vermont Butter and Cheese, for example, which produces 15,000 cheeses a week, supports about 20 family farms,

Origin

Vermont’s cheese production cluster, which consists almost entirely of local farmers and capital, has a long history in the state. Consider Bardwell opened the state’s first cheese factory as a cooperative in 1864 in West Pawlet. Crowley Farms, the oldest continuously operating cheese producer in the U.S., opened 18 years later about 25 miles away. Recently cheese has developed into a premier tourism attraction. Cabot Creamery, Crowley Cheese, and Grafton Village Cheese all are listed in *Watch It Made in the U.S.A.: A Visitor’s Guide to Companies that Make Your Favorite Products*.

Location

Cheese makers are distributed throughout the small state of Vermont, although nearly all of the produc-

ing farms are located in very rural areas, mostly in villages and small towns.

Associational Infrastructure

The Vermont Cheese Council formed in 1998 with a grant from the Vermont Sustainable Jobs Fund to preserve the tradition of cheese making in Vermont by promoting farmers and enhancing accessibility to markets, especially non-resident tourists. The Council supports artisan cheese producers, contributes to research and expertise related to dairy and cheese products, and encourages the sustainability of the small-farm culture. It serves as the liaison with national industry organizations like the American Cheese Society, and in 2007 hosted its annual meeting in Burlington.

Development

By the latter half of the 19th century, an increasing demand for milk products, advancements in transportation, and the growing presence of dairy farms propelled Vermont’s cheese making industry into one of the most productive in the union. Since then, however, cheese production has waned with consolidation and decline in the numbers of farms. Moreover, lower milk prices and rising fuel costs have prompted some farmers to turn to artisan cheese making as a “vehicle for the renewal of their community.” The Vermont Cheese Council helped create the statewide Cheese Trail to link tourism to the state’s cheese production cluster. Demand for artisan cheeses has grown substantially over the last

	State Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>	X				
<i>Training</i>					
<i>Services</i>		X			
<i>R&D/T</i>		X	X		
<i>Marketing</i>	X	X			X
<i>Capital</i>				X	X

decade, and the Council serves both to foster growth in this niche market and to promote indigenous products to non-local tourists.

Interventions

The Vermont Cheese Council assists small and large artisan cheese makers gain access to markets and build a strong reputation for their products. Many of these farmstead cheese makers take part in the organization's Vermont Cheese Trail, an emergent attraction that some compare to the "early years of winery tourism" in the Napa Valley. The number of participating farms increased from 20 in 2006 to 34 in 2008. Overall, Vermont's cheese makers produce about 70 million pounds of cheese per year, much of it artisan or handcrafted. The University of Vermont provides education, research, technical services, and public service through the Vermont Institute for Artisan Cheese and its Cooperative Extension. The Windham Foundation in Grafton helped restore Grafton Village Cheese Company, a coop that burned down in 1912.

Community Engagement

Shelburne Farms, featured on the Cheese Trail, is described online as a nonprofit environmental education center. It offers seasonal programs to people of all ages.

Outcomes

<i>Economic</i>	Economic outcomes are strong (some cheeses command \$30/pound).
<i>Opportunity</i>	No explicit policies but initiatives aimed at small, marginal dairy farms.
<i>Environmental</i>	Highlight humane treatment of animals and environmental education.

2. Catfish Farming in the Mississippi Delta

Description

Catfish is the leading aquaculture farming industry in the U.S., and the Mississippi Delta the most productive region. It's known as "the hub of the nation's catfish industry" and produces the highest quality fish. In 2003, it boasted one-half of the nation's annual production, approximately \$243 million. As recently as 2006, the Delta's catfish cluster encompassed over 144,000 acres of aquaculture ponds, with an average size of 10 to 20 acres. Farming operations in the region tend to be highly specialized and often are single-enterprise operations. In recent years, many catfish farmers, buffeted by foreign competition and soaring corn and soybean feed costs, have been draining their ponds. Some have switched to a cheaper corn-derivative feed to reduce costs. Others, making only 75 cents at market for each dollar invested in catfish, are going out-of-business.

Origin

Long a staple of the lore of the Deep South, catfish started out chiefly as a local delicacy. As farmers realized that catfish could be a marketable cash crop, they began to install artificial ponds on soils considered too dry for cotton. And when catfish proved the more lucrative crop, these ponds rapidly took over former cotton fields. J. B. Williamson dug his first catfish pond in 1965 in Humphreys County. By 1976 U. S. catfish production totaled 55,000 acres with Humphreys County leading the U.S. with 6,000 acres under cultivation. The county today has over 35,000 acres of catfish ponds, but the cluster has become severely distressed and pond acreage declining.

Location

The Delta region is a relatively well-defined geographical area of the Mississippi River alluvial valley in northwest Mississippi. This 17-county region is known both for soils that have a high clay content and large farms that average 430 acres in size.

Associational infrastructure

Cooperatives, trade organizations, institutes, and teaching farms represent all segments of the industry. The Catfish Farmers of America has represented farmers, processors, feed mills, researchers, and suppliers since 1968. This Mississippi-based trade organization funds conventions, publishes periodicals, and sponsors trade shows. The Delta Pride cooperative was founded in 1981 by a group of Mississippi catfish farmers to process and market their product. Lastly, the Catfish Institute was founded in 1986 by catfish feed mills and their producer members with the goal of raising consumer awareness about the benefits of U.S. farm-raised catfish.

Development

At the time the first catfish farm opened in the mid-1960s, many counties in the Delta region were economically depressed. This region has deep roots in agriculture, farming rice, soybeans and cotton. Local farmers, however, were looking to move away from traditional staple crops to a more profitable one. With assistance from the Mississippi Cooperative Extension Service and financial investors, the catfish farmers of Humphreys County were able to maintain the local agrarian economy

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>					
<i>Services/Entrepren.</i>	X				
<i>R&D/T</i>			X		
<i>Marketing</i>					X
<i>Capital</i>					

and establish themselves as leaders in an industry that quickly transformed the economy of the area.

Interventions/support

The Delta Council, an economic development organization representing the interests of 18 Delta and part-Delta counties in northwestern Mississippi, has worked with Congress and USDA officials to lobby on behalf farmers. The Council also works to persuade the U.S. Fish and Wildlife Association to confront the losses to production caused by invasive waterfowl. The Delta Center of Technology Transfer researches projects on aquaculture-related pathology, economics, fish behavior, nutrition, and water quality.

Community Engagement

None mentioned.

Outcomes

After expanding for a decade, the industry contracted in 2002 and 2003 due to competition from foreign imports driving commodity prices to record lows. The decline further accelerated in 2005 and 2006 as producers from Vietnam and China flooded the domestic market, putting an even lower low ceiling on prices. The current economic recession (2009), as it drags on, very well may spell disaster for even more farmers.

<i>Economic</i>	This is a poverty-persistent region, and raising catfish in artificial ponds has been one of the few economic mainstays.
<i>Opportunity</i>	Labor is mostly low-skill and also is low pay.
<i>Environmental</i>	As ponds become more crowded and require aeration, increased waste creates off-flavor fish. New EPA standards are being set.

3. Wine Cluster in Southern Washington

Description

The thriving wine cluster in the Walla Walla Valley, a very rural region of southern Washington, is home to nearly 90 wineries, with more new wineries starting up each year

Origin

The roots of the cluster can be traced to Italian immigrants who began growing grapes and making wine there in the early 1800s. By 1876, the Walla Walla Valley annually was producing about 2,500 gallons of wine. The region’s first post-prohibition winery was Blue Mountain Vineyards, which opened in 1950. In 1984 the Walla Walla Valley was federally recognized as a unique American Viticulture Area (AVA), the third area in the state to be so designated. Recent cluster growth has been explosive: In 1990 there were just six wineries in the Walla Walla Valley, but by 2004 there were 70 wineries. Today there are close to 90.

Location

The Walla Walla Valley of Washington is located on the state’s southeastern border with Oregon in the foothills of the Blue Mountains. The name “Walla Walla” is a Native American term for “many waters,” and it is the waters flowing down from the Blue Mountains that provide irrigation for the region’s 1600 acres of grapes under cultivation. The Walla Walla Valley extends across Walla Walla, Benton, and Franklin Counties.

Associational infrastructure

In 2000, the Walla Walla Valley Wine Alliance organized with 100 percent of the Valley’s wineries and 98 percent of the Valley’s planted grape acreage represented. But even before that time, dense social relationships had been developing. In fact, the growth of the cluster has been based on close social relationships. For example, Waterbrook and other wineries provided space, equipment, and help to fledgling wineries, which generated close, personal relationships throughout the local industry. Local growers and vintners also seek to be good stewards of the local environment. They work together through a local group called VINEA—The Winegrowers’ Sustainable Trust—to implement sustainable, organic, and biodynamic growing and winemaking processes.

Development

The wine cluster is an integral part of a regional and state economic development strategy based on wine, food, and art. In fact, the town of Walla Walla is prominently featured in author John Villani’s guidebook to the “100 Best Small Art Towns In America.” The climate, soil, history, and geographic isolation that long deterred industrial development in the local area all have contributed to the growth of the wine, culture, and tourism clusters.

Interventions/support

The Center for Enology and Viticulture at Walla Walla Community College is one of only two col-

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>	X	X	X	X	
<i>Services/Entrepren.</i>				X	
<i>R&D/T</i>			X		
<i>Marketing</i>	X				
<i>Capital</i>					

leges in the nation that directly produce wine for sale and the only such center directly connected to a culinary arts program. The wine cluster has been a regional development strategy; the Center was funded by a combination of state, federal (USDA), local funds and private donations from 409 donors, including dozens of foundations.

Community engagement

Nothing noted

Outcomes

The program has earned various superlatives, such as being named as one of 12 “Distinctive Destinations” by the National Trust for Historic Preservation. According to *Sunset Magazine*, Walla Walla has the “Best Main Street in the West.

Students in the Enology and Viticulture program at Walla Walla Community College tend to be older, better educated, and wealthier than typical community college students. Many seek a mid-career, change.

<i>Economic</i>	The wine cluster has created jobs directly and contributed to tourism and startups of six new wineries.
<i>Opportunity</i>	The program is allied with a strong culinary arts and hospitality program that attracts more lower-income students.
<i>Environmental</i>	These programs contribute to and encourage an emerging local foods movement.

4. Aquaculture along the coast of Maine

Description

This aquaculture industry cluster is recognized as a “major center of the industry in North America.” Maine’s fishing cluster comprises finfish, shellfish, and sea vegetable farms that employ over 1,200 people. These farms produce “top quality Atlantic salmon, steelhead trout, American oysters, and nori.” Firms range in size from small, family-owned shellfish farms to large, multinational salmon farms. Along the coast of Maine, there are about 100 farms and 14 hatcheries.

Origin

Commercial fishing has supported Maine’s coastal communities for hundreds of years, but commercial farms did not exist before the 1970s. The first finfish farms, Maine Salmon Farms and Fox Island Fisheries, opened in 1970 and 1973, respectively. Both companies suffered debilitating losses after persistently untenable weather (e.g. the so-called Superchill of 1976) depleted their fish stock, and they ultimately ceased operations. Shellfish farms opened around the same time, but they lacked capital, seed stock, and optimal sites. The aquaculture cluster did not grow significantly until farmers utilized techniques developed by local researchers. Once farmers adopted improved bottom-culture and pen-rearing techniques, smaller companies reached a sustainable level of production and some even grew into larger companies.

Location

Covers counties along the eastern coast of Maine.

Associational infrastructure

The Maine Aquaculture Association (MAA) represents all aquaculture farmers (freshwater, marine, shellfish, and finfish). The association is the oldest of its kind and is dedicated to growing the industry.

Development

This cluster is the result of a grassroots effort started by oyster growers along the Damariscotta River who founded the Maine Aquaculture Association in 1976. The association focuses upon improving the efficiency of production techniques, facilitating the diffusion of information throughout the cluster, and advocating on behalf of farmers.

Maine’s geographic advantage and existing infrastructure (e.g. value-added processing, research centers, and universities) has enabled the cluster to reach the critical point of sustainability. In addition, the federal government has designed national policy that encourages industry growth for the dual purpose of reducing the U.S. trade deficit and for replenishing depleted wild fish stocks.

Interventions/support

In 1988, the Maine State Legislature financed the creation of Maine Aquaculture Innovation Center (MAIC). MAIC plays an instrumental role in establishing industry-research partnerships and educating Maine’s leaders, entrepreneurs, and youth. In addition, MAIC’s 12-person board comprises representatives from industry, higher education, and government. It also serves as a clearinghouse for infor-

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					X
<i>Training</i>	X	X	X		
<i>Services/Entrepren.</i>			X		X
<i>R&D/T</i>	X	X	X	X	
<i>Marketing</i>					X
<i>Capital</i>					

mation and assists in the formulation of policies favorable to industry growth.

The University of Maine’s Advanced Technology Center and Washington County Technical College also have a role in spurring innovation and entrepreneurial activity. Local researchers have received funds from foundations such as the A.W. Mellon Foundation for their research programs.

Community engagement

As members of their local communities, fish farmers often are engaged with community activities.

Outcomes

The goal is to be “responsible stewards of the environment.”

<i>Economic</i>	Capital investment in infrastructure totals \$100 million. Salmon farmers produced \$78.9 million in 2000 and the value-added processing capabilities are growing.
<i>Opportunity</i>	None mentioned.
<i>Environmental</i>	Both MAA and MAIC are working with farmers to develop innovative and sustainable farming methods. MAA published a set of environmental guiding principles encouraged cooperative bay management, and developed a comprehensive code of practice.

5. Seafood in Nelson, New Zealand

Description

With more than 20 seafood operators, Nelson, New Zealand is the center of the country's seafood and fishing industry. Firms based in Nelson hold about 70 percent of New Zealand's fishing quota, and most of the country's aquaculture development is within a 60-mile radius of the city.

Origin

Fishing has been a staple of the regional economy for decades but only in the last 25 years has Nelson moved into fisheries management, marine sciences, and engineering, and processing. The Port of Nelson today offers full services 24 hours a day, seven days a week.

Location

Nelson, a city of just over 40,000, sits on the Tasman Bay at the northern tip of the South Island, just across the bay from Wellington. The larger Tasman district includes about 60,000 people. The area has many natural amenities, being situated close to beaches, mountains, and plains. It has been called a "creative paradise."

Associational infrastructure

The cluster had a formal cluster association and full-time facilitator but did not sustain. The Nelson Marlborough Seafood Cluster is an economic development agency tasked with creating a renowned facility for seafood education, research, and technology. Its director seeks to network New Zealand's best seafood educators and scientists with local

seafood companies and support industries to create sustainable commercial development. The Seafood Industry Training Organization brings together all education and training providers in the region. There also is a New Zealand Seafood Council headquartered in Nelson, as well as the Sealord Group, a consortia of the largest seafood companies in the South Pacific.

Development

The government's quota system for fishing, established in 1986, endowed Nelson with the lion's share of New Zealand's fishing rights. Further development of the cluster is part of a continuing national cluster strategy that has endured despite several changes in government. New Zealand began its cluster approach in the mid-1990s after the government contracted for studies and recommendations with consultant Michael Porter. The government's early interest in networks lent support and even government funding to public and private initiatives. The accidental death of the cluster's most charismatic research scientist was a setback for the collaborative research agenda.

Interventions/support

In 2002, the New Zealand government announced another modest program that has supported a cluster facilitator. Education and training have been instrumental in the growth and expansion of the industry. The polytechnic's specialization in fisheries and marine sciences also contributed immensely. The cluster task force initiated both an apprenticeship program and a Seafood Technology

	State Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>		X			
<i>Training</i>		X	X		X
<i>Services/Entrepren.</i>		X			
<i>R&D/T</i>		X			X
<i>Marketing</i>					
<i>Capital</i>					

Pathway program. The cluster facilitator acquired research grants for a network of three research institutions. A recent \$150,000 grant to analyze seafood industry training needs will help strengthen tertiary programs. Another \$150,000 matched by industry will be spent for research on adding value to the cluster.

Community engagement

Unreported, especially regarding to the Maori, the indigenous people of New Zealand.

Outcomes

Although marine industries represent a large cluster, the region is not totally dependent on it. The Nelson area also has strong cultural assets, including a large and growing arts and crafts community, wineries, and spectacular scenery that together attract large numbers of tourists. It is not clear how an energy crisis could affect shipping and tourism, given the geographic isolation of New Zealand.

<i>Economic</i>	The region appears to be thriving, both through this cluster and tourism. In 2006, Nelson had a slightly higher unemployment rate (4.2 percent) than the nation as a whole (3.8 percent).
<i>Opportunity</i>	The cluster offers good employment opportunities. One in eight residents are Maori, most of whom are employed as laborers. But the Sealord Group, an international fishing, processing, and marketing operation is predominantly Maori owned, the single largest Maori business in New Zealand.
<i>Environmental</i>	New Zealand is very concerned with sustainability and introduced the NZ Fisheries Quota Management System to limit harvests and conserve fish stocks.

6. Wine in North Carolina's Yadkin Valley

Description

Eighteen wineries in the Yadkin Valley, a rising wine-producing region, are spurring steady growth in supplies (Carolina Wine Supply in Yadkinville), wine bars, tourism (especially bed-and-breakfasts), and the food industry.

Origin

Winemaking has been part of North Carolina's culture since the earliest settlers. Before Prohibition, in fact, North Carolina was the nation's leading wine-producing state. The industry did not begin its resurgence, however, until the 1990s, when farmers began looking for alternatives to tobacco. State government organized a grape council in 1986; the award-winning Westbend Vineyards (near Lewisville) began growing grapes in 1972; and Shelton Vineyards (near Dobson and Mt. Airy) launched its operations in 1999. In February 2003, the Yadkin Valley earned its designation as an American Viticultural Area (AVA), the first such region in North Carolina. Today the Yadkin Valley has developed a strong regional brand that is attracting increasing numbers of tourists.

Location

The Yadkin Valley is a true river valley, covering over 1.4 million acres in northwestern North Carolina. It reaches from the base of the Blue Ridge Mountains to the eastern edge of the North Carolina Piedmont. The region's clay-loam soil and temperate climate are well-suited for growing European varieties, including, among whites,

Chardonnay, Viognier, and Pinot Grigio; among reds, Merlot, Cabernet Franc, and Syrah.

Associational infrastructure

The Yadkin Valley Winegrowers Association, located in Charlotte, was established to promote the region's wines and wineries. It assists them with a variety of business operations. The Old North State Winegrowers Cooperative in Mt. Airy has 38 members (not all wineries) and operates as a cooperative with a membership fees and a committee and social structure.

Development

This cluster is part of a deliberate state and regional strategy to develop the wine industry as a replacement for tobacco and manufacturing and to promote tourism. In 1986 the state began offering tax breaks to farmers to grow grapes, but the major stimulus was the search to find ways to replace tobacco. Subsequent grants from the Golden Leaf Foundation supported efforts to develop the wine cluster, including ongoing support for a wine industry association. The Appalachian Regional Commission and USDA also have provided support to the cluster.

Interventions/support

Supported by grants from the Golden Leaf Foundation, Surry Community College started offering courses in viticulture in 1999. Today it offers a two-year degree in viticulture and enology that enrolled xx students in 2007. The North

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>			X	X	
<i>Services/Entrepren.</i>		X			
<i>R&D/T</i>					
<i>Marketing</i>	X	X		X	
<i>Capital</i>	X			X	

Carolina Department of Tourism also helps to market the Yadkin Valley region at the airports, with publications, and on line as a increasingly popular wine trail. North Carolina State University's Cooperative Extension also offers technical and marketing assistance.

Community engagement

Wineries in the Yadkin Valley are mostly locally owned and thus integral to their respective communities.

Outcomes

With this region as its hub, the state is developing a strong reputation for wines. It's expanding economic opportunities and local markets.

<i>Economic</i>	Fast-growing part of the regional economy.
<i>Opportunity</i>	Requires capital for entry but offers good wages, abundant opportunities for learning about industry
<i>Environmental</i>	Encourages people to buy local rather than imported products. Also offers a reasonable (dollar value) substitute for waning tobacco revenues.

7. Food Processing Cluster, Southeastern Ohio

Description

The food processing cluster in southeastern Ohio is comprised of an eight-county region in Appalachia. It was part of an initiative to add value to the area’s agricultural assets; promote a sense of “place;” and support local entrepreneurs.

Origin

ACENet, the Appalachian Center for Economic Networks, was incorporated in 1985 as a means to build a healthy regional economy through the support of small business. Subsequently, a group of organizations – which included ACENet, Rural Action, the Foundation for Appalachian Ohio, the Ohio Arts Council, the Ohio University Voinovich Center, and People for Adams County Tomorrow – formed the Appalachian Ohio Regional Investment Coalition (AORIC) “to explore this shift from local entrepreneurship to a dynamic regional economy.” The resulting “Regional Flavor” strategy linked those in the food industry with artisans and entrepreneurs in tourism in the hopes they would collaborate and develop new ideas and enterprises. From the successes of this program, additional stakeholders began to expand opportunities in the artisan, wood, hospitality and tourism sectors.

Location

This cluster is located primarily across eight counties in southeastern Ohio, plus an additional 21 counties in the larger ACENet service area. The area is in the Appalachia region. ACENet also has

attracted entrepreneurs from throughout the state of Ohio, as well as Kentucky and West Virginia.

Associational infrastructure

ACENet actively promotes networking and collaboration, and expanding opportunity as paramount to the cluster’s mission. Several independent associations have spun out of the original cluster, and ACENet was able to organize farmers into a Community Supported Agriculture group. However, there has never been a formal association; self-organization and collaboration has always prevailed.

Development

The cluster grew from less than a dozen specialty food businesses to over 100, and several entrepreneurs have spun off several businesses. Its boundaries are “very fluid.” Additionally, businesses began to work together to promote the area, both to locals and tourists, and a regional brand has been established.

Interventions/support

The cluster facilitator was one of the early leaders in network development. One of the first early interventions was a foundation grant to form networks among the producers and farmers. With subsequent support from various agencies and foundations, ACENet developed a kitchen incubator and farmers market; increased access to markets for food and farm entrepreneurs; and created regional branding

	State Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>		X			X
<i>Training</i>		X	X	X	X
<i>Services/Entrepren.</i>		X		X	
<i>R&D/T</i>					
<i>Marketing</i>				X	X
<i>Capital</i>		X			X

programs for farm and processed products. ACEnet also designed the program Entrepreneurship in Action, funded by Appalachian Regional Commission, to foster entrepreneurship among youth and designed an on-line curriculum for the food and arts clusters.

Community engagement

ACEnet is a community-based organization that is fully engaged with the local communities. June Holley developed a method called “network weaving” to map and strengthen relationships within the region. The program is also part of the Central Appalachian Network, an association of non-profits dedicated to building community involvement.

Outcomes

As the food program became more creative in its packaging and marketing, the program expanded into the arts as well, developing arts and tourism to complement the artisan foods. In 2008, Nelsonville started a new incubator, that is already 60 percent occupied. As a result of numerous grants, ACEnet’s programs have been assessed repeatedly. The Aspen Institute found, for example, that in 2008 77 new clients were participating in the Food We Love program and that markets for food artisans had expanded significantly.

<i>Economic</i>	Supports value-added products that command a premium. Establishment of business incubator.
<i>Opportunity</i>	Appalachian entrepreneurs are targeted, particularly those who have a lower income. Segment of cluster works on food security issues.
<i>Environmental</i>	Focus on buying local.

CREATIVE ECONOMY

8. Leather and Related Crafts in Northeastern Wyoming

Description

This cluster includes about 25 to 30 firms and independent artisans who make or support leather goods. The cluster is well known internationally, sells by phone, mail order, and the Internet, and exports most of its products. Don King’s Saddlery in Sheridan, Wyoming is the cluster hub, largest employer, and home to an extensive leather and Western museum.

Origin

Leather craft in the western U.S. dates back to the 19th Century when it was a staple of Western and horse riding attire, equipment, and accessories, including shoes, belts, and holsters. The modern era began in the 1950s when Don King developed his own unique leather craft style, stamping complex patterns of wild roses into saddles. In what eventually became known as the Sheridan style, King used unusually deep stamping to achieve greater depth to the patterns. These saddles became collectors’ items, acquired by Queen Elizabeth, Ronald Reagan, and the Crown Prince of Saudi Arabia, as well as by various art museums. Many artisans who learned the Sheridan style later took off on their own and became independent leather crafters, suppliers, or tool makers

Location

The companies are clustered mainly in Sheridan and Johnson Counties in northeastern Wyoming.

Associational infrastructure

The social infrastructure of this cluster is predominantly informal, although each June Sheridan hosts the nation’s largest leather trade show, the Rocky Mountain Leather Show, where leather crafters from the larger Western region meet and network.

Development

The leather and related crafts cluster has been primarily driven by a desire to maintain local traditions and the area’s Western heritage. The leather-working skills are passed on informally through apprenticeships. There are no formal educational programs.

The conditions especially favoring the cluster’s development have been markets in the regional economy and for Western heritage, which includes a large number of ranches, rodeos, dude ranches that attract families, and tourists who are interested in Western attire and culture.

Interventions/support

There have been no known interventions or sources of external support, although there is a current recommendation that Sheridan College establish a new certificate program for leather crafts that includes entrepreneurial skills. In addition, since this is really part of a larger creative economy cluster in Sheridan and Johnson Counties, any support that draws people to western art benefits the leather makers as

	Regional Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					
<i>Training</i>					
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>					
<i>Capital</i>					

well. Sheridan College and a number of local organizations supported the research that led to the Creative economy study in 2008.

Community engagement

This cluster, other than the influence of Don King on tourism, retail shops and museum, is largely invisible to the local community; it has not been part of any national, state, or local economy data analyses.

Outcomes

<i>Economic</i>	No measures of revenues since most are self-employed; many firms and artisans operate on margins.
<i>Opportunity</i>	The cluster is theoretically open to anyone with the skills to do the craft. No formal education is deemed necessary. There is concern about the aging of crafters and ability to attract youth to learn the trade.
<i>Environmental</i>	Protection of the environment is necessary to keep ranges open.

9. Seagrove Potteries in North Carolina

Description

About 80 potters live and work in Seagrove, the “Pottery Capital of North Carolina,” located in the state’s clay-rich Piedmont area. While Seagrove is the identifiable hub, more than 100 potteries radiate out for 25 miles into unincorporated towns in Randolph, Moore, and Montgomery counties. Wares range from traditional face jugs and contemporary-style teapots to whimsical animals and elegant, custom-made jewelry.

Origin

Seagrove’s pottery dates back 300 years, when Colonial potters, mostly from Staffordshire, England, began crafting earthenware milk crocks, churns, bean pots, storage jars, and whiskey jugs for everyday use. For decades the pottery was fired from the region’s heavy red clay and sold from covered wagons rolling through North Carolina. Jacques and Juliana Busbee founded Jugtown Pottery in 1917 and transformed the area’s pottery-making into an art form. To market these products, Juliana set up the Village store in 1918 in Greenwich Village, New York. Many of today’s well established potters settled in Seagrove during the 1970s, while newcomers appear to be migrating to the area after graduating from college or working as an apprentice elsewhere.

Location

Seagrove is a small town with fewer than 300 inhabitants located 10 miles south of Asheboro, 14 miles

from the Uwharrie National Forest, and about 40 miles from Pinehurst, the state’s golfing capital.

Associational infrastructure

Although there are strong family ties among some of the oldest pottery companies, most of the potters are not networked. In fact, at least two different factions within the local and regional pottery communities often have been at odds with one another. Recent disputes have contended, for example, over guidelines governing the Seagrove brand and the type of work that can be displayed at the annual pottery festival, which in 2008 split into two competing exhibitions. A front-page article on the *Raleigh News & Observer* in June 2008 observed, “In a community known worldwide for throwing clay, there’s a lot of mud-slinging going on. A fracture has developed among Seagrove’s famed potters.”

Development

The cluster is part of a tourism effort rather than a specific effort to promote a pottery cluster. The state chiefly uses the cluster as a magnet to attract tourists to the region. Unlike the ceramic artists attracted to the North Carolina mountains because there is an opportunity to become part of a well established network of artists, the regional tourist market for ceramic goods has been the main draw for latest wave of new Seagrove potters. Seagrove’s reputation draws customers, which in turn draws more potters.

	Regional Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					
<i>Training</i>			X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>	X				
<i>Capital</i>					
<i>Infrastructure</i>	X				

Interventions/support

Montgomery Community College offers an associate's degree and a certificate in Professional Crafts with a specific emphasis upon clay. With continuing education and degree/certificate options, the 17-wheel program serves potters at all levels of expertise from Randolph, Moore, Lee, and Montgomery counties. The North Carolina Pottery Center in Seagrove offers exhibits and educational programming on North Carolina history and the technology of pottery making; has information on pottery shops both in Seagrove area and across the state; and preserves a collection of North Carolina pottery and related artifacts. There also is a competing Museum of North Carolina Traditional Pottery, and part of the struggle going on within the cluster concerns whether the cluster's pottery center ought to promote only the local traditional art of Seagrove or the broader scope of ceramics produced across the state.

Community engagement

The community is very engaged, but not always in a positive way. Two different groups are organized but often act at cross-purposes.

Outcomes

<i>Economic</i>	Successful businesses, strong brand, and well developed economy that attracts tourists and markets.
<i>Opportunity</i>	Split in the community between traditional and new, more experimental, potters needs to be healed. Few, if any Latino potters although there is a large Latino community.
<i>Environmental</i>	Unknown

10. Handmade crafts in North Carolina's Toe River Valley

Description

The core of the handmade crafts cluster, which is invisible on any state employment database, consists of about 400-500 artisans producing functional and decorative arts, supported by dozens of galleries, gift stores, suppliers, and educators. Most are self-employed, although a small number have employees.

Origin

The Appalachian Mountains have long been home to craft artisans and musicians, but the turning point was 1929, when the Penland School of Craft was established to teach weaving to local women. As the school diversified into other crafts and grew, it attracted more and more artisans from other regions to teach, as resident artists (beginning in 1963), and to learn (1,200 per year). Today the Penland School of Craft attracts about 14,000 visitors per year. Many of the students and teachers have remained in the area to work, either in private or shared studios.

Location

The Toe River Valley of the Black Mountains winds its way through Yancey (population 17,000) and Mitchell (pop. 14,000) Counties bordering Tennessee about 50 miles northeast of Asheville and connected to each other by State Highway 19E. The county seats are Burnsville (pop. 1,700) and Bakersville (pop. 800), respectively.

Associational infrastructure

The primary organization is the Toe River Arts Council (TRAC), which has offices in the two counties. TRAC has two galleries and shows artists' work, organizes semi-annual open studio tours, regular musical events, publishes a newsletter, is developing an e-commerce web site for members, and generally supports the communities. Other groups of artists operate collaboratively though, for example, the Glass Blowers of the Toe River, the Potters of the Roan Mountain, and the Celo Craft Cooperative. Penland is another central meeting place for the cluster.

Development

Two key trends led the Yancey and Mitchell Counties to pay more attention to handmade crafts and their related potential for tourism: 1) The rapid loss of manufacturing employment, once the staple of the regional economy, that began in the late 1990s; and 2) the lack of prospects for immediate employment for a displaced work force with low levels of educational attainment.

This handmade crafts cluster is part of a larger western North Carolina development strategy, led by the regional nonprofit HandMade in America, to supplement and replace manufacturing employment.

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>				X	
<i>Training</i>			X		
<i>Services/Entrepren.</i>	X	X		X	
<i>R&D/T</i>					
<i>Marketing</i>	X	X		X	
<i>Capital</i>	X	X			

Interventions/support

The region has received a number of grants that have resulted in the EnergyXchange, an incubator for glass studios, ceramics studios, and greenhouses powered by methane from the landfill; and the “Home of the Perfect Christmas Tree,” a retail site created to market and sell local crafts related to a popular children’s book. The Appalachian Regional Commission and Community Development Fund support the conversion of an historic high school building into the Mountain Heritage Center in Burnsville, studios and office spaces for local artists and arts organizations. Other supported efforts include exhibitions of handcrafted architectural products that encourage local builders and interior designers to use more locally crafted elements.

Community engagement

The cluster is heavily engaged in the local community, donating crafts to fund raising events, playing music at celebrations, participating on community committees and task forces, and joining together with other communities on economic development. There is, however, a political chasm between long-time residents, many of whom are conservative evangelical Baptists, and the cluster members, who tend to be liberal, well educated, and secular.

Outcomes

The number of artists has grown and sales increased, mainly through a very active local arts council. There remains a split between the “come heres” and the “been heres”, however, based on religion, politics, and attitudes toward protecting the environment between the non-local artists and many of the long-time residents.

<i>Economic</i>	Economic output is difficult to measure because of bartering, underreporting, and other sources of income.
<i>Opportunity</i>	The crafts community try to be open and welcoming regardless of class, race, ethnicity, and actively seeks and it values diversity.
<i>Environmental</i>	The cluster is environmentally responsible in conservation efforts but there are strong conservative opposing interests among those who make their living from hunting, logging, and mining stone.

11. Folk Art in San Luis Valley, Colorado

Description

The San Luis Valley, the poorest region in Colorado (based on reported wages), claims (without citation) to have the highest concentration of artists in the nation. According to a directory maintained by Monte Vista artists' group, there are more than 500 working artists, including several nationally recognized contemporary, folk, and functional craft artists. The folk art cluster thus would be almost as large as the region's manufacturing sector, which has 700 employed.

Origin

There is a long history of folk art in the region—particularly fiber art—but the genre was only rediscovered as a serious art form in the 1970s. The San Luis Valley also is widely considered to be one of America's most intriguing and mysterious geographic regions and an undeniable UFO hot spot, which also has led to an unusual art form (the crystal skull) and attracted a lot of tourists. Although some artists from other places have been drawn to settle in the area, most are natives who have developed their own talents over time.

Location

The San Luis Valley extends across the Rio Grande Rift at an average elevation of 7,500 feet. In Southern Colorado bordering New Mexico, it includes parts of six counties, and its hubs include the towns of Alamosa (pop. 15,000), Monte Vista (pop. 4,500), Antonito (pop. 900), and South Fork (pop. 600).

Associational infrastructure

A variety of organizations promote cooperation and sharing across the large geographic area. The Artes del Valle, a nonprofit started by and for Hispanic women in 1975, helps with training, marketing, and selling. The San Luis Artists' Cooperative, operating out of a historic convent, does the same for its members; it also operates a bed-and-breakfast.

Development

Economic development planners recognize the value of the art as a draw for tourism and thus support promotion, training, markets and marketing, and cooperatives. The Valley is also known for its music. The area has a number of major festivals and other events that promote both art and music.

The region has a strong tradition of entrepreneurship, and 30 percent of people are self-employed. Lack of employment opportunities also has driven people towards such self employment.

Interventions/support

One main source of support is Adams State College in Alamosa, which has a strong arts program. The Clyde Snook Gallery has two theaters and runs regular workshops on art topics. The Colorado Arts Council awards small grants to support local arts councils and events, such as the Creede Arts Council, Crest Music Festival, and "Preserving and Protecting our Cultural Heritage." The economic development agencies support the nonprofits that market the arts.

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>	X				
<i>Training</i>			X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>	X				
<i>Capital</i>					

Community engagement

The artists represent the community and thus are fully engaged.

Outcomes

<i>Economic</i>	Maintain a very rural economy without a significant manufacturing base.
<i>Opportunity</i>	Many of the folk artists are Native Americans and Hispanics.
<i>Environmental</i>	Unknown

12. Mata Ortiz Pottery in Northern Mexico

Description

Sold in galleries throughout Mexico and the U.S. Southwest, the pottery of Mata Ortiz has developed a solid reputation and well-known brand. More than 400 potters create original functional pottery that may rival and even surpass New Mexico's better-known Pueblo Pottery. It is considered as fine arts rather than craft because this work is not routinely produced with a repetitive style. The potters of Mata Ortiz combine both intellectual and aesthetic elements. Each artist has freely developed his or her own form of expression, his or her own language through which to communicate. The clays are from the valley floor or the nearby foothills of the Sierra Madre Mountains, and the paints are made from this clay or crushed manganese, also mined locally.

Origin

The original inhabitants of Mata Ortiz were part of the Casas Grandes civilization, a network of villages in Northern Mexico that thrived from the 11th Century until about 1350 A.D. Near the present-day site of Mata Ortiz stood the city of Paquimé, whose achievements included hand-built ceramics featuring maze-like motifs, animal figures, and stone-polished surfaces. The people of Paquimé mysteriously vanished around 1400, leaving behind a legacy of exquisite pottery. More than 40 years ago, Juan Quezada began making and painting pottery based on the shapes and designs of the prehistoric Indians that he had discovered in the nearby ruins of Paquimé in Casas Grandes. By 1976, he was selling the decorative earthenware to traders from El Paso.

Location

Mata Ortiz is a village of about 2,000 people in Chihuahua in northern Mexico about four hours south of El Paso. The closest city with tourist accommodations is Nuevo Casas Grandes (pop. 44,000), located about 27 miles away.

Associational infrastructure

The cluster is the community and is family-based. The Posada de las Ollas in Mata Ortiz provides accommodations that offer visitors the opportunity actually to live with the potters. It is located a block from the village center and surrounded by pottery families. The artists' children often display their parents' latest offerings.

Development

The pottery cluster has developed organically with skills passed down through families and friendships. Over time the artists' work has evolved from imitating traditional pre-Hispanic designs to embodying their own uniquely creative expressions. These artists are rarely satisfied to rest upon what they already have accomplished and are constantly searching for new languages, new natural pigments, new clay, and techniques, which will make them grow as artists. Many believe that Mata Ortiz has just now attained what will be viewed as its classic period.

Interventions/support

No special interventions mentioned in the literature. The region hosts a study abroad ceramics pro-

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>					
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>					
<i>Capital</i>					

gram for Paradise Valley Community College in Phoenix, Arizona.

Community engagement

The cluster is the community so there is no distinction between the two.

Outcomes

Much of the profit goes to distributors and galleries, but it provides a reasonable living and economic base for the community. The area was selected to host the 2007 Integrating Environmental Solutions for the U.S. Mexico Border because of its record of sustainability .

<i>Economic</i>	Some growth but still modest incomes.
<i>Opportunity</i>	Inclusive in this homogeneous community.
<i>Environmental</i>	Region selected by USAID as model of sustainability in 2007.

13. Visual Arts on Salt Spring Island, British Columbia

Description

Salt Spring Island, British Columbia is known as “the island of the arts.” More than 10 percent of its residents are involved with the arts in some capacity. Located in the center of the Salt Spring Island, Ganges (population 6000) is the island’s commercial center. Its downtown area is the location of the island’s popular Saturday Market. There also are many arts festivals throughout the year. Salt Spring Island prints its own alternative local currency, which is 100 percent backed by the Canadian national currency.

Origin

While Salt Spring Island has always been a haven for artists and those seeking an “alternative lifestyle,” it has become even more popular over the past 10 years. The local population and tourism have increased, and its artists’ studio tours have become “must attend” events.

Location

Salt Spring Island (pop. 13,000) is located just east of Vancouver Island, between Vancouver Island and mainland British Columbia. It is the largest (70 square miles) and most populated of the Canadian Gulf Islands. The village of Ganges is the largest on the Island and serves as its hub. The Island is accessible only by ferry or floatplane, both of which have regularly scheduled services. The ferry trip to Victoria takes about 30 minutes, and it takes about 90 minutes to Vancouver.

Associational infrastructure

The Salt Spring Arts Council provides “funding, material and organizational support to a broad range of groups and individuals” and “fosters a positive environment for visual and performing artists, artisans, writers and performers—enriching the lives of all Salt Spring Island residents.” A spinoff group, the Island Arts Centre Society, formed in 1989 with the mission to build and operate an arts center, which they have done successfully. In addition to these groups, there are a number of informal associations and groups, as well as several guilds. There also are several organized studio tours, with the oldest having run for 18 years. This particular tour began as a “loose group of individuals” but has evolved into an organization that prints and distributes 50,000 tour maps yearly. There are a variety of arts competitions and other events throughout the year.

Development

The visual arts cluster has developed organically, as new residents, including artists, move to the island. Most residents express a desire for a “simpler life.” They celebrate the entrepreneurial spirit of the area, as well as the ongoing network of support from their fellow artists. As the Island’s popularity has grown, more arts-related events have been established. Groups are established as a need is seen.

Interventions/support

The provincial and national governments, as well as several foundations, provide arts funding. There are

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					X
<i>Training</i>			X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>					
<i>Capital</i>					

a number of private donors who contribute to the local arts groups, and there also is some Olympic legacy funding beginning to come in.

Community engagement

The community seems to be close-knit, with its members sharing similar ideals. Robert Bateman, a well-known artist, founded ArtSpring, an 11,800-square-foot building that contains a 5,200-square-foot exhibition/multi-purpose area and a 6,600-square-foot, 259-seat theatre.

ArtSpring hosts many cultural events and is the only professional year-round presenter of concerts and other cultural performance events. The locally circulated Salt Spring Island Dollars expire after two years, at which time the “profit” is used to fund community projects. Local artists donate their work to appear on the currency.

Outcomes

This is a socially and environmentally conscious cluster and open but it is also self-selective, with members being financially able and willing to live in that political environment.

<i>Economic</i>	The area is growing ever more popular in terms of people moving there and visitors attracted. Artists are finding a larger commercial venue for their works.
<i>Opportunity</i>	The cluster is open to anyone and provides a supportive environment.
<i>Environmental</i>	There is concern for the environment, which is what attracts and retains the talent-based businesses.

TOURISM & CULTURE

14. Music-Based Tourism in Branson, Missouri

Description

The music-based tourism cluster consists of a concentration of predominantly country music venues that attract visitors from around the world. *60 Minutes* calls Branson “the country music capital of the universe.” Others have dubbed it “the live music capital of the nation.” Visitors can attend a wide variety of music venues: country, pop, gospel, bluegrass, western, rock, classical jazz, and Broadway. The town has 53 theaters, and many of them offer two or three shows each day. Approximately 8.4 million people visited in 2007 and spent about \$1.8 billion. Nearby lakes, 13 golf courses, a theme park, and shopping centers lure visiting tourists.

Origin

Branson incorporated in 1881 and began to welcome tourists soon after Harold Bell Wright published his best-selling novel *The Shepherd of the Hills*, based on his earlier visits in 1907. After construction of the town’s first live performance theater in 1952, tourism-related entrepreneurial activity increased substantially. Most of these early theaters were family-run and showcased local talent. Also around this time, country legend Red Foley moved to Springfield to host the “Ozark Jubilee.” The Presley family, often called Branson’s First Family of Entertainment, built the first theater in 1967 along Highway 76, now known as “The Strip”.

Location

Branson (pop. 7,453) is located on the southwest corner of Missouri, near the borders of Oklahoma and Arkansas. The majority of its theaters are located along Highway 76. The town also is surrounded by three prize-winning fishing lakes, Taneycomo, Table Rock, and Bull Shoals. Today, historic downtown Branson is a center for community activity, shopping and hosts a variety of events year round.

Associational infrastructure

The Branson Lakes Area Chamber of Commerce represents numerous multinational companies and locally owned businesses and theaters in the town.

Development

The Chamber has been an instrumental force in fostering local economic development, bringing together the music performance businesses and helping to market the cluster.

In the 1950s, local talent and support from local businesses, citizens, and government officials helped the cluster grow. The most important factors that fueled the cluster’s growth, however, have accessibility and marketing. About one-quarter of the nation’s population lives less than one day’s drive from Branson. Moreover, a recent survey of tourists revealed that 60 percent of visitors live beyond a

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					X
<i>Training</i>					
<i>Services/Entrepren.</i>	X				X
<i>R&D/T</i>					
<i>Marketing</i>	X				X
<i>Capital</i>	X	X			

300-mile radius of the town. Ever since *Time* magazine and *60 Minutes* both did feature stories on Branson in 1991, the number of attractions in the town have more than doubled.

Interventions/support

The town’s economic development department supports the cluster by recruiting new businesses, advocating for improvements for the town’s infrastructure, and expanding capital investment for projects like the new Convention Center. The Downtown Branson Main Street Association, Inc. (DBMA) leads revitalization efforts for Branson’s historic business district. DBMA has strong working relationships with the City of Branson, the State of Missouri Department of Economic Development, the Missouri Division of Tourism, and the Lakes-Area-Not-for-Profit Council.

Community engagement

There is a high amount of community participation in the town’s annual festivals and parades. The Branson Veteran’s Task Force provides a number of festivities including the Veterans Homecoming held during Veterans Week in November, the town’s Independence Day celebration, and Memorial Day ceremonies.

Outcomes

<i>Economic</i>	Local government officials expect employment, investments in local attractions, tourism spending, and number of visitors to increase substantially..
<i>Opportunity</i>	Unknown
<i>Environmental</i>	During the last decade, town government spent millions of dollars to improve roads, expand highways, and develop along lake front property.

15. Casino Gambling in Tunica County, Mississippi

Description

Tunica County, Mississippi is known as “The South’s Casino Capital” and can boast about hosting the third-largest gaming destination in the nation. The casinos are arrayed as dockside gambling resorts moored on floating barges. Overall, the gambling cluster made the top 10 list for annual gross revenues in 2007 for bringing in the \$1.24 billion. Nine local casinos employ over 15,000 people, while other local industries employ 7,000 people. The casinos draw more than 10 million visitors annually.

Origin

This is a young cluster that emerged soon after Mississippi’s state legislature legalized gambling in 1990. Splash Casino opened in 1992 in Mhoon Landing, a picturesque park located on the Mississippi River about four miles west of the town Tunica. In 1993, three more casinos opened in the same town and established the first gaming cluster in the state. Since that time, several casinos have ceased operations or relocated to other towns in the county. Currently, nine casinos, numerous hotels, and three championship golf courses are concentrated in the northern part of Tunica County. The cluster’s growth is directly attributable to \$3 billion of gaming and resort-oriented investments.

Location

The cluster is located in the northeastern region of Mississippi in Tunica County. The county is 72 per-

cent African American, 24 percent of the population living below the poverty line, and only 9 percent holding a baccalaureate degree. All of casinos are situated along the Mississippi River in Tunica Resorts Robbinsville. The gaming establishments are a short 45-minute drive from Memphis, Tennessee and even closer to Interstate 55, a major North-South thoroughfare.

Associational infrastructure

The executive director of Tunica Chamber of Commerce lobbied the county government and the state legislature to create the Tunica Convention and Visitors Bureau in 1997. This organization was specifically created to “put all tourism entities together” and increase visitation by marketing the area’s attractions.

Development

The development of the cluster has been part of a local economic development sector strategy to develop a formerly economically distressed area once known as “America’s Ethiopia.” In 1990, the per capita annual income per resident was only \$5,500 and the unemployment rate was 13.1 percent. The Mississippi state legislature picked Tunica County as the location for the state’s first casino in order to inject revenue, growth, and income into the impoverished former cotton-raising county.

The opening of the Visitor’s Bureau in 1997 was part of a larger public strategy to capitalize on the

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>			X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>	X				
<i>Capital</i>	X				

success of cluster and further develop the area as a tourist destination spot.

Interventions/support

The state's schools added a casino-oriented training class in 1996, with the goal of providing trained workers for the casinos. Most, if not all, of these workers were former welfare recipients. The state further provided incentives and infrastructure to attract and retain the casinos and markets them as part of its tourism strategy.

Community engagement

None mentioned in the literature, but community residents have participated in job-training programs.

Outcomes

The cluster has had a major economic impact on this very poor predominantly minority, very poor region. Before casinos, federal assistance supported an estimated half of the local population. After the casinos opened, per capita income tripled and the unemployment rate decreased to half to previous rate. Tourist visits also increased after Hurricane Katrina.

<i>Economic</i>	The presence of casinos has “stimulated the regional economy but with uneven effects on the population.”
<i>Opportunity</i>	The cluster has provided much better jobs to an impoverished region, the number of crimes has almost doubled, and other sectors have not grown as predicted.
<i>Environmental</i>	With no countywide sewer and water authority, developers invested millions to upgrade public infrastructure, restore the lake, and preserve housing for the elderly.

16. Montolieu, France, village of living books

Description

Book towns and villages, modeled upon the first book town in Hay on Wye, Wales, are tourist attractions centered around book culture. Montolieu, France, is one such book town that seeks to extend the idea of book culture to the creation of a town that is a “living book.” Montolieu markets itself as a comprehensive book village, encompassing all elements of writing and graphic arts.

Origin

At one time, Montolieu was a textile center with a population of 2,500. Mill closures, however, resulted in a shrinking population and unstable economy. In 1989, Michel Braibant, a bookbinder from a nearby region, retired to Montolieu with the intent of creating a book village. Braibant established the Conservatoire Européen des Métiers et des Arts Graphiques, (Academy of the Trades and Arts.) The academy was established to be a cultural center, tourist attraction and tool for the creation of jobs. In subsequent years, Braibant solicited support from writers, merchants, local government officials and citizens to firmly establish Montolieu as a book town. Montolieu now boasts fifteen book shops, a gallery of 100,000 titles, a museum, craft shops, and bed and breakfasts.

Location

With a permanent population of around 800, Montolieu attracts bibliophiles from around the world. Nestled between two rivers and close in proximity to larger cities and a regional airport, the aesthetic quality of Montolieu played a significant

role in site selection. The village is located 17 km north west of Carcassonne, 90 km from Toulouse, 70 km from the Mediterranean Sea and 100 km from the Pyrenees. In the village, tourists can readily walk between bookshops, eateries, the Museum and lodging in the small town. The paper mill, located 7 kilometers away, is accessible by bike or train.

Associational Infrastructure

One of the first investments was the rehabilitation of a paper mill located near Montolieu. Other associational infrastructure included Le Musée des Arts et Métiers du Livre. In addition to its function as a museum, Le Musée des Arts et Métiers du Livre is an educational resource, providing classes and workshops in writing, printmaking, paper making and book binding. Finally, the Book Association Workshop, designed for both children and adults, teaches “book manufacturing,” from idea to final binding.

Development

Braibant invited Richard Booth, the father of Hay on Wye, to Montolieu to help support his proposal. Recognizing the potential of Montolieu, Booth purchased two properties, one that became the first bookshop, the other that became the Café de Livre, the center of the fledging book village. While community officials were initially reticent to support the effort, success rapidly earned governmental support. Prior to the book town effort, Montolieu was struggling to maintain services and the local grocery and school were on the verge of closure.

	Regional Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					
<i>Training</i>			X		X
<i>Services/Entrepren.</i>	X				
<i>R&D/T</i>					
<i>Marketing</i>	X	X			
<i>Capital</i>					X

Interventions

After the death of Braibant in 1992, Montolieu established a steering committee that merged the book village efforts. This steering committee worked to develop educational opportunities at the museum, market Montolieu on a national and international level and created a book fair on the third Sunday of every month. The Department of Tourism is responsible for marketing efforts.

Community Engagement

While explicit numbers are not given, Atelier du Livre (The Book Workshop) offers financing for needy students from a variety of community partners including the City Council, PTA and the Federation of Parents.

Outcomes

Economic Community experienced significant economic revitalization.

Opportunity Residents were able to remain in Montolieu year-round, instead of following work to other regions of France.

Environmental None explicitly mentioned.

<i>Economic</i>	Community experienced significant economic revitalization.
<i>Opportunity</i>	Residents were able to remain in Montolieu year-round, instead of following work to other regions of France.
<i>Environmental</i>	None explicitly mentioned..

ENERGY & ENVIRONMENT

17. Mining in Sudbury, Ontario, Canada

Description

Sudbury’s mining cluster has 14 producing mines and two major smelters, 270 mining supply and service firms, specialized service sector firms including environmental services, lawyers, accountants, and consultants who understand the industry, and mining research institutions. Employment in the mining itself, 27,000 workers in the 1970s, has been reduced by automation to 6,000 in 2004, but at the same time use of local suppliers has increased.

Origin

Sudbury sprang into existence in the 1880s as a small railroad junction, and timber was the main local industry. Copper and nickel were discovered during railway construction in 1883, and prospectors flooded in from all over the world. The first copper smelter opened in the 1880s. The Sudbury Basin, geologically formed by a fallen meteor, provides about 16 percent of the world’s nickel, as well as significant amounts of copper and platinum metals.

Location

Though a relatively large “small” city (pop. 93,000) in northern Ontario, this cluster is included because Sudbury only recently grew to its present size and still has a small town atmosphere. In 2001 Greater Sudbury formed when several outlying towns and villages consolidated with the city, but most of the added population remains classified as rural. The city has 330 lakes within its borders. A branch of

the Trans-Canada highway connects the region to other major cities in Ontario.

Associational infrastructure

Firms interviewed in 2003 were not aware that they were part of a “cluster” in part because there were no strong associations or leaders. The formal structure the does exist tends to serve individuals, not companies. The region is home to Canada’s largest branch of the Canadian Institute for Mining Metallurgy and an active branch of Professional Engineers.

Development

The ready availability of critical industry resources—chiefly copper and nickel—caused the mining cluster to form and grow. Sudbury relied only upon mining for its economy until the 1970s, when consultants concerned about over-specialization recommended diversification. The mining sector had grown organically because of the available natural resource base, but public sector looked for alternatives. The mining cluster continued to grow despite the lack of public sector attention.

Interventions/support

Investments in research and development (R&D) have contributed significantly to the cluster’s growth. The move of the Ontario Geological Survey to Sudbury further gave the cluster a boost by attracting exploration companies. The Province of Ontario also started the first PhD program in

	Regional Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>		X			
<i>Training</i>			X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>		X			X
<i>Marketing</i>	X				
<i>Capital</i>					

Precambrian and mineral geology in Sudbury. Just recognizing the industry as a cluster also has strengthened it.

Community engagement

The community has been engaged informally, first when the environmental impacts became known and then more recently after the national government funded the cluster analysis.

Outcomes

Local smelting of mining 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 intensive logging that provided fuel for early smelting techniques. In 1992, however, Sudbury was one of 12 cities worldwide that received the Local Government Honors Award at the United Nations Earth Summit. The city was honored for its community-based environmental reclamation strategies. More recently, Sudbury has begun to plant grass and trees around the slag heaps that surround the Copper Cliff smelter area. Skilled labor is a continuing issue and problem for the cluster despite a high unemployment rate, suggesting either a gap in education and training or low interest in the work.

<i>Economic</i>	Mining continues to be the driving force of the region's economy.
<i>Opportunity</i>	Large mines control much of cluster but the scale and quality of opportunities for the working class are unknown.
<i>Environmental</i>	Recognition of environmental effects has led to new measures and an emerging environmental services sector.

18. Wind Farms in West Texas

Description

This cluster is composed of wind farms. Only four foreign countries produce more wind energy than does west Texas. In fact, the region supplies more than 25 percent of U.S. wind energy production. FPL Energy, a subsidiary of the FPL Group, Incorporated, is a leading clean energy proponent with several 200-plus megawatt (MW) wind farms.

Origin

This emerging cluster was founded in 1994 when the first wind farms, Wind Power Partners and Buffalo Gap II, went online.

Location

West Texas includes 22 counties in the Northern Chihuahuah Desert that have more in common geographically with the American Southwest than the rest of the state.

Associational infrastructure

The West Texas Wind Energy Consortium coordinates joint action to maximize economic benefits of wind energy. It works with regional wind energy coalitions in the Texas Panhandle, Rolling Plains, Permian Basin, and Texas Mountains regions. This Consortium distributes a monthly newsletter, holds regular monthly meetings, coordinates advocacy services, and organizes trade fairs. Texas State Technical College-West Texas helps organize the Consortium and coalitions. Consortium members include public and private sector leaders, as well as individual and nonprofit supporters of the regional wind energy sector.

Development

The wind energy cluster did not grow significantly until the Texas legislature designed a Renewable Portfolio Standard (RPS) that mandated construction of specified amounts of renewable energy. This legislation prompted the wind energy industry to rapidly accelerate production in Texas and required electricity companies to support renewable energy generation. The RPS also ensured that the public benefits of renewable energy, including wind and solar, will continue to be recognized as electricity markets become more competitive. The Texas state government estimates that more megawatts of renewable energy have come online as a result of the RPS program than had been generated in the previous 100 years. After the RPS was implemented, Texas wind corporations and utilities invested \$1 billion in wind power.

Interventions/support

T. Bone Pickens, billionaire oilman, is investing between \$6 and \$10 billion in building the world's largest wind farm by installing large wind turbines in parts of four Texas Panhandle counties. He forecasts that such projects will not only reduce demand for oil but will create thousands of jobs. When completed, the wind farm will generate more than five times the 735 megawatts produced at the existing largest such U.S. farm according to the American Wind Energy Association. In 2007, Pickens' firm, Mesa Power, announced that it had filed with the state of Texas to add 4,000 megawatts of electricity to the state grid. Mesa Power projects that the project will be completed in 2011. Texas

	State Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					X
<i>Training</i>			X		
<i>Services/Entrepren.</i>					X
<i>R&D/T</i>					
<i>Marketing</i>					
<i>Capital</i>		X			X

regulators have approved a \$4.93 billion wind-power transmission project, providing a major lift to the development of wind energy in the state. Texas State Technical Community College West Texas offers two certificates and one AAS degree in Wind Energy Technology (but does not yet offer a degree) to meet hiring demands.

Community engagement

Some communities are divided over whether the wind energy farms are a boon or bane. Some farmers say the low-frequency noise from the wind turbines makes them feel ill. Others say that if tax subsidies for the industry end, the communities will be left with thousands of unsightly “monsters.”

Outcomes

Texas already is the largest producer of wind power in the nation, with the aggregate power capacity exceeding 5,300 installed megawatts. Ranchers earn extra revenue leasing land to power companies.

<i>Economic</i>	Average industry pay is two to three times higher than the local average. County governments are seeing substantial increases in tax revenues.
<i>Opportunity</i>	Community college degrees are focused on developing skills among people displaced by farming or other failing industries. Very few locals have prior wind energy experience.
<i>Environmental</i>	Each turbine can power up to 500 homes.

19. Coal Methane in Gillette, Wyoming

Description

The City of Gillette’s official seal promotes the municipality as the “Energy Capital of the Nation.” Never before studied as a “cluster,” Campbell County boasts of producing more than a third of all the nation’s coal-based electricity. Coal-bed methane (CBM), which involves the extraction of natural gas from coal, is the fastest growing segment of this cluster. The cluster consists of 16 mining companies, 11 mining equipment and supply companies, five mining consulting companies, 10 trucking/transportation companies, and some 240 companies without employees (self-employed). In all, the cluster employs about 6,000 people.

Origin

Early homesteaders scrounged for coal so they could heat their homes. Starting in 1909, they build small mines at various locations around the county. Campbell County’s first major coal mine was Wyodak, the first surface mine in the West and still operating today with an annual production of about three million tons. In the 1970s coal companies built large surface mines in Campbell County, shipping the output by train to coal-fired power plants in the Midwest. In 1999, Campbell County produced 95 percent of Wyoming’s coal. Production of coal-bed methane began in the late 1990s.

Location

Gillette is a small city (pop. 20,000) in Campbell County, Wyoming. Set in the northeast quadrant of America’s least populated state, its closest neighbor

cities are more than 100 miles away, and none are much larger than Gillette.

Associational infrastructure

The Western Fuels Association and the Northeast Wyoming Contractors Association are two business associations. The rest of Gillette’s associational infrastructure is informal and dominated by industry.

Development

The state of Wyoming’s economy is heavily dependent on energy production. Thus the state is committed to developing its natural resources, which is tantamount to a “cluster” strategy without applying the label.

Factors that have spurred the growth of the cluster include the energy crisis of the 1970s, the emergence of coal-bed methane technology, and a largely unregulated, very business-friendly political environment. In fact, billions of tons of sub-bituminous coal as yet lie undeveloped in Campbell County. Future expansion of the mining industry likely will come from exploiting the area’s existing coalmines as well as through gas exploration and development.

Interventions/support

Cluster development has been industry-led, although supported by research at the University of Wyoming. With growing labor shortages, the major public sector interventions are workforce-related.

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>		X	X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>			X		
<i>Marketing</i>					
<i>Capital</i>					

Wyoming economic development officials and company representatives aggressively recruit autoworkers from Michigan to meet mining cluster labor needs. Several hundred have moved to the state. Project Lead the Way is a pre-engineering program at the high school in Gillette that strives to get local youth into the technical career pipeline. Students use the laboratories at Gillette County campus of Sheridan College in some of their courses. The University of Wyoming assists with technology transfer and commercialization in new energy technologies.

Community engagement

Industry is firmly in control and broad-based community involvement minimal.

Outcomes

CBM product water has a moderately high salinity hazard and often a very high sodium hazard, based on standards used for irrigation suitability. Irrigation with water of CBM product water quality on range or croplands should be done with great care and managed closely. With time, salts from the product water can accumulate in the soil's root zone to concentrations that will adversely affect plant growth.

<i>Economic</i>	Currently booming economy with lots of job opportunities, but dominated by small number of large companies.
<i>Opportunity</i>	Hires immigrant workers but Wyoming is a right-to-work state.
<i>Environmental</i>	Harmful to environment but increasing pressure for regulatory controls.

20. Wind Energy in Minnesota

Description

This is a small opportunity cluster scattered across southern Minnesota. At present there are a small number of companies and suppliers with strong public sector support for growth and a ready market. The cluster has not yet establishing a strong brand identity, but it hopes to do so.

Origin

The wind energy cluster in Minnesota is relatively new. Xcel Energy, the largest producer of wind energy in the U.S., likely will anchor the emergent cluster. The firm has 19 wind turbines in Pipestone (pop. 9,400) and Dodge (pop. 19,800) Counties and is planning a 100-megawatt wind farm in Mower County (pop. 38,700). Five other companies manufacture wind turbines, four install them, and still others repair them. Suzlon Rotor Corporation in Pipestone, for example, began making wind turbine blades in 2006.

Location

Although the wind energy cluster is statewide, most of the manufacturing is in southern Minnesota.

Associational infrastructure

The social infrastructure for wind energy extends statewide although it tends to be headquartered in large cities. There are a number of wind energy industry-related trade associations and nonprofits, such as Wind on the Wires and the Minnesota Renewable Energy Society in St. Paul and Community-Based Energy Development in Minneapolis.

Development

The vitality of the cluster draws upon the fact that global wind energy production has more than quadrupled in the past seven years, and Minnesota, with its close ties to Scandinavia (where much of the cutting-edge research is taking place) and its government support, is well positioned to seize a competitive advantage.

The state of Minnesota has a long history of being out in front on social responsibility and wind farms are a natural outgrowth of its farm economy.

Interventions/support

Minnesota has a large grant from the U.S. Dept. of Labor (WIRED) that includes research and training for the wind power cluster. The state is working toward a relationship with Vestas Wind Systems in Denmark, the world's largest producer of wind turbines. Agricultural cooperatives, including Southwest Minnesota Renewable Energy Marketplace, advocate and support renewable energy. West Minnesota Community College offers a wind energy mechanic diploma, wind energy technician associate degree, and a windsmith certificate.

Community engagement

Engagement is mainly through environmental groups that support renewable energy efforts.

Outcomes

This is part of a statewide plan to develop the renewable energy sectors as clusters and is likely to

	State Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					
<i>Training</i>	X	X	X		
<i>Services/Entrepren.</i>		X			
<i>R&D/T</i>		X			
<i>Marketing</i>		X			
<i>Capital</i>					X

grow, especially with the stimulus for energy in the new federal legislation.

<i>Economic</i>	It is too soon to judge outcomes, but to succeed the cluster will have to meet sustainable economic goals (or be subsidized).
<i>Opportunity</i>	Likely to be placed on private land, affect the landscape and be under public scrutiny
<i>Environmental</i>	By definition, the cluster's goals aim to decrease reliance on fossil and other fuels

21. Renewable Fuel in Northern Iowa

Description

This cluster focuses on companies that manufacture and distribute renewable fuels, chiefly ethanol and biodiesel. Twenty-nine ethanol plants in Iowa produce a total of more 2.5 billion gallons of ethanol per year. Ethanol is a renewable alternative energy source made from Iowa corn. It has been used as an alternative to gasoline since the Ford Model T, which was built to run on both fuels. In early 2008, there were 14 operating biodiesel plants in the state. Biodiesel is alternative fuel derived from biomass material such as crops, crop wastes, trees, wood waste and animal waste. Examples of biomass include wood chips, corn, corn stalks, soybeans, switchgrass, straw, animal waste and food-processing by-products.

Origin

The first biodiesel processing plant opened in 1996 in Ralston, Iowa.

Location

Although the cluster is defined as operating statewide, most of the current plants are concentrated in the northern part of Iowa.

Associational infrastructure

The Iowa Renewable Fuels Association (IRFA) brings together Iowa ethanol and biodiesel producers to foster the development and growth of the state's renewable fuels industry through education, promotion and infrastructure development. IRFA is committed to making Iowa a leader in renewable fuels and value-added co-products.

Development

Clean-burning and produced from domestically produced corn, the federal government instituted a series of tax breaks to encourage ethanol production. Ethanol and biodiesel production are part of a national effort to reduce dependence on foreign oil by shifting to alternative fuel sources. Iowa, as one of the nation's largest agricultural states, especially as producers of corn and hogs, is well positioned to convert the corn and hog waste. In 2007, Iowa farmers planted the largest corn crop ever grown in the state, anticipating a record demand for corn that would be converted to ethanol. By late 2008, however, a drop in price for corn, crude oil, and ethanol had reduced expected revenues, prompting three ethanol refineries to file for bankruptcy. The ethanol industry has overbuilt, according to the IRFA, and more closures were expected. Meanwhile, the troubled U.S. biodiesel industry was seeking to counter the high cost of soybean oil and other feedstocks by exporting its product to Europe, subsidized by a weaker dollar and a \$1 per gallon tax credit. The U.S. shipped 300 million gallons of biodiesel to Europe in 2007, an amount 10 times greater than that shipped in 2006.

Interventions/support

Iowa's state government launched a Renewable Fuels Infrastructure Grants Program in 2006 that pledged to invest \$13 million over three years. The Iowa Energy Center leads the state in providing accurate, usable information on renewable energy such as wind, solar, and biomass energy. This renewable energy data is used by a broad range of Iowans including utilities, farmers, manufacturers,

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>	X				
<i>Training</i>			X		
<i>Services/Entrepren.</i>	X				
<i>R&D/T</i>	X				
<i>Marketing</i>	X				
<i>Capital</i>					

municipalities, school districts, and even neighboring states and the national energy laboratories. The Energy Center’s record of delivering valuable research and baseline information on Iowa’s renewable energy has resulted in the Iowa State Legislature choosing the Energy Center to manage the its Alternate Energy Revolving Loan Program.

Community engagement

No information.

Outcomes

The future of ethanol production depends upon U.S. energy policy and the economics of ethanol. Policy has been friendly to ethanol production, but there is a movement to eliminate subsidies because of its energy inefficiency and impact on food prices. Second is the economics of ethanol production itself. With corn at \$2 per bushel and crude oil at \$70 a barrel, ethanol was very profitable. With corn around \$4 and oil prices fluctuating, the outlook can look a great deal different. The use of corn to ethanol is now being blamed for raising food prices.

<i>Economic</i>	Ethanol lowers dependence on foreign oil, creates jobs for Iowans, attracted over \$3 billion in investments in Iowa. But the balance between price, energy independence, and food has been shifting.
<i>Opportunity</i>	Accused by raising food prices making it hard for low-income families to subsist.
<i>Environmental</i>	Ethanol lowers harmful carbon monoxide (CO) emissions by 30 percent and reduces carbon dioxide (CO2) emissions by 27 percent. It is rapidly biodegraded in all environments. The U.S. Environmental Protection Agency credits gasoline mixed with ethanol as reducing and controlling hazardous emissions. Ethanol production actually accounts for 15 percent of Iowa’s greenhouse gas emissions, more than from burning natural gas or coal. It takes almost as much energy to produce ethanol as it saves.

WOOD PRODUCTS

22. Chairs in Udine, Italy

Description

This is a very well known cluster that until just a few years ago (prior to the onset of direct competition from China) made a third of all the wooden chairs sold worldwide. In 2002, the 1,200 small companies in the Province of Udine’s industrial district produced half of all chairs sold in Europe. As testament to that remarkable legacy, a seven-story chair weighing 23 tons sits in the heart of the small town of Manzano. The cluster comprises many very small highly specialized companies—e.g., varnishing, leather upholstery—that operate as networks to produce final products. Ninety percent of the firms have fewer than 20 employees. In recent years, these firms have begun to outsource some operations to Eastern Europe to meet Chinese competition.

Origin

Furniture production skills in Udine Province date back to the Eighth Century when the town manufactured altars, with large-scale chair production beginning in the 1800s. Mass production arrived after World War II, when distributors began buying in bulk. In 1927 there were 96 companies; in 1951, 127; and in 2002, 1,200.

Location

The cluster is centered in the town of Manzano (population 7,000) and about 10 surrounding towns in the Friuli Venezia Giulia Region of north-eastern Italy near the Slovenian border. The cluster also includes two other towns in what is known as the “Chair Triangle.”

Associational infrastructure

The social infrastructure is informal. All companies are locally owned with long-term familial and social relationships. The various production networks form another type of social infrastructure.

Development

The Italian Industrial Chair District, which had existed for decades, officially became a “cluster” under Regional Law n. 27 that in 1999 established Industrial Districts. A District Committee representing the 11 municipalities organizes and coordinates both projects and the social and political forces. The District has experienced gradual development of its skills base, markets, networks and reputation over long period of time. A huge increase in demand in the 1980s, however, and the shift from large to very small, interrelated, highly specialized companies clearly contributed to the cluster’s fast growth.

Interventions/support

Business associations with government subsidies/matching provide real services such as marketing, training, capital, business advice, and technical assistance. Current support is helping the district find ways to brand itself and distinguish its products from Chinese imports.

Community engagement

The cluster is the community in Northern Italy; there is little separation of economic and social life.

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>	X				
<i>Training</i>			X		
<i>Services/Entrepren.</i>	X				
<i>R&D/T</i>	X				
<i>Marketing</i>	X				
<i>Capital</i>					

Outcomes

The cluster still faces stiff competition from China. It has lost about 30 percent of its firms over last few years, down to about 900 companies producing fewer and fewer chairs. Most of the products are easily imitated. Some remaining companies subcontract more of their work to Eastern Europe.

<i>Economic</i>	The cluster's future is still unclear and may depend upon the District's ability to produce higher-end goods at higher prices, but even those companies are outsourcing more functions. It's not clear yet where the economy of the cluster will level out.
<i>Opportunity</i>	One reasons for reorganizing the cluster into smaller firms in the 1980s was to reduce employee protection offered by larger companies. The biggest economic opportunities have been entrepreneurial, not promotions up career ladders.
<i>Environmental</i>	Sustainability is not an explicit goal. However, because the production occurs in the communities where the owners have lived for many generations, they make more effort to avoid pollution and degradation of the environment.

23. Furniture in Lahti Region, Finland

Description

This furniture cluster comprises more than 100 companies, 90 of which have fewer than 20 employees. These firms represent about half of Finland's furniture industry and employ about 3,000 people. Another 2,300 work in related wood industries in the value chain—e.g., sawmills, plywood factories, paper, and loggers.

Origin

Since the 1920s, the Lahti region has been Finland's leading producer of furniture, largely because of the abundant supply of high-quality birch in the nearby Lake Paiijanne area, skilled carpenters, the tradition of strong craft education, and good transportation. The two largest companies are ASKO Furniture, started in 1918, and ISKU, started in 1928. Decades earlier, the region was a major exporter of wood bobbins, and the carpentry and furniture industries developed from that earlier cluster.

Location

The cluster is located in the region surrounding the city of Lahti (pop. 98,000) in southern Finland.

Associational infrastructure

Pro Puu is an association of carpenters, designers, and architects organized to link craftsmen and designers; improve craftsmanship, quality control and networking among professionals; preserve traditional woodworking techniques and craftsmanship; and promote the use of Finnish wood in furniture, interiors, and buildings. In 2001, the Finnish

Association of Designers named Pro Puu “Designer of the Year.” In the late 1990s, the Finnish government launched efforts to encourage networking among businesses.

Development

The growth of the cluster primarily has been driven by employees and managers of the two largest firms finding niche markets, but there also has been strong support from the chamber of commerce and regional government. Since the cluster is characterized by low investment in R&D, it depends heavily on external public sector support for much of its technological innovation. In the 1990s, the cluster became less competitive because it lacked indigenous design resources, effective cluster organization, and the legacy of a bilateral trade agreement with the former USSR. Unemployment in the region was up to 25 percent. The cluster responded with more intensive design and greater cooperation among firms, training to increase productivity, developing an image of sustainability through its careful harvesting of lumber, and exploration of new export markets.

Interventions/support

In 1996, a year after Finland became a member of the European Union (EU), the EU Social Fund supported, through the chamber of commerce, the Lahti Furniture Technology and Design Project. This project enabled 55 companies to identify training needs, develop a training plan and train 700 employees, and promote lifelong learning. It also aimed to increase cooperation among the networks

	Regional Gov.	National Gov.	Public Education	Foundations	EU
<i>Networking</i>					
<i>Training</i>			X		X
<i>Services/Entrepren.</i>			X		X
<i>R&D/T</i>			X		X
<i>Marketing</i>					
<i>Capital</i>					

of suppliers, logistics firms, and manufacturers, as well as to highlight the environmental and quality aspects of the cluster. The Lahti Institute of Design educates furniture designers, while the Lahti Polytechnic educates engineers for the furniture cluster and has a unit that does furniture testing and approval. Higher-level education occurs at the Lahti Center of Helsinki University. Salpaus Further Education and Training (FET) trains carpenters, artisans, and builders of wooden houses in wood processing, surface finishing, and upholstery. The faculty of the Polytechnic, through the TUPAS program of Tekes (the National Technology Agency of Finland), provide research in the wood processing automation for small and medium-sized enterprises.

Community engagement

With wood enjoying a robust craft tradition in the region, the community has a strong interest in the cluster.

Outcomes

<i>Economic</i>	Provides employment but in a cluster that likely will see further contraction and outsourcing to Eastern Europe before leveling off in design-intensive firms.
<i>Opportunity</i>	The education and training efforts are aimed at the lowest achieving population.
<i>Environmental</i>	Cluster looking to establish a brand associated with sustainability and environmental responsibility.

24. Motion Furniture in Northeastern Mississippi

Description

This cluster comprises more than 200 manufacturers specializing in recliners and incliners, plus many of their suppliers of springs, hardware, fabrics, stuffing, and finishing.

Origin

The birth of the cluster took place in 1948, when Chicagoan Morris Futorian chose New Albany (pop. 7,600) as the site for a plant to mass-produce upholstered furniture. That one factory spawned dozens of imitators and suppliers, which in turn spawned dozens more (called the graduates of “Futorian University”). The concentration of these firms then began attracting manufacturers of springs, filling, and fabrics.

Location

The firms cover a multi-county area in Northeastern Mississippi, with the highest concentrations of companies in Pontotoc, Chickasaw, Lee, Tippah, and Prentiss Counties.

Associational infrastructure

The social infrastructure is informal, with most of the companies owned by friends and neighbors. Most firms belong to the American Furniture Manufacturers Association, but this organization is not very active locally.

Development

This has been a regional strategy that no longer receives attention or support, as the region seeks to diversify into health care and, more recently, automotive manufacturing with the successful recruitment of Honda assembly plant that will undoubtedly offer higher wages than furniture.

Mississippi was the first state to offer tax relief to attract manufacturing, thereby acquiring Futorian. Proximity to lumber sources and low-cost surplus labor has been a major factor. A very aggressive and world-renowned nonprofit Community Development Foundation helped attract suppliers.

Interventions/support

Large employers and equipment manufacturers jointly established the Advanced Technology Center for Furniture Upholstery in 1984. The Center closed in about 2004 due to lack of demand for graduates with associate degrees. Other cooperative efforts include joint showrooms in Tupelo and annual furniture fairs. Mississippi State University’s Furniture Research Unit provides technical advice.

Community engagement

The companies and employees are the community, and most of the socialization is through churches and civic organizations.

	Regional Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					
<i>Training</i>			X		
<i>Services/Entrepren.</i>				X	
<i>R&D/T</i>			X		
<i>Marketing</i>				X	X
<i>Capital</i>					

Outcomes

The cluster faces increased competition from low-wage areas. It currently imports parts but assembles on site because of bulk and difficulty with easily packaging. Even if this obstacle is overcome with new packaging technology, however, the outlook is bleak. Competition for labor is keen, and companies often poach each other's workers for small salary increases.

<i>Economic</i>	The future is uncertain for this low-end non-innovative cluster that has competed chiefly on the basis of low cost. It already imports parts from China and only the bulkiness of the final products has kept assembly in Mississippi.
<i>Opportunity</i>	The cluster has brought wages above the rest of state, but wages are still low compared to national averages. The cluster does offer employment to those with low educational levels, but their main chance for advancement is as an entrepreneur.
<i>Environmental</i>	The cluster uses lumber in large quantities, increasing imports from China and thus adding to its carbon footprint.

25. Log Homes in Montana’s Bitterroot Valley

Description

The cluster manufactures log homes in an area well known for this industry and sometimes called “Log Home Alley.” From 1988 to 1998, 37 new companies started up. In Ravalli County, despite reductions in logging activity on national forest land, 75 percent of all manufacturing employment is in lumber and wood products.

Origin

In the 1930s, the Civilian Conservation Corps operated in the Rocky Mountain forests. In 1938 when the program wound down, a few entrepreneurial corpsmen discovered a market for log homes. In 1946, National Log Construction established a milled log home company that generated new markets and businesses and ultimately expanded in size. Prior to that time, firms had produced log cabins but not family-size homes. Proximity to the lodgepole pine forests and logging, plus the growing interest in mountain homes, contributed to the industry’s growth.

Location

The cluster mainly runs along Highway I-93 through Ravalli County in what is called southwestern Montana’s Bitterroot Valley. Some companies, however, are located as far as 100 miles north on the Flathead region and 100 miles east near Bozeman.

Associational infrastructure

In this close-knit community, there is no formal cluster association. “Everybody knows everybody”

in the industry. As one company owner describes it, “We used to think we were all enemies...now the best thing about our organizations is in learning what someone else is doing and what may be beneficial to you. [We] still compete, but [we] understand the value of cooperation.” Sawmills develop long-term network-type relationships with loggers, loggers with haulers, and log homebuilders with design and engineering firms. Much of the networking occurs when the local development agency organizes workshops, through chamber of commerce events or in association-sponsored events. For example, a “leads” group of business people meets semi-monthly to exchange business leads and information and look for opportunities to collaborate.

Development

This cluster developed as a result of private sector investment decisions, not public policy interventions to intentionally create a cluster. It was “discovered” during a cluster analysis for the Montana Governor’s Office in 2002.

The easy availability of lumber and the opportunity to add significant value to it created the business climate that spawned the cluster. Availability of capital—and local banks that understand the industry and participate in its associations—have met most of cluster’s demands for venture and working capital.

Interventions/support

There was no systematic overall cluster-targeted

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>					
<i>Services/Entrepren.</i>					
<i>R&D/T</i>		X	X		
<i>Marketing</i>					
<i>Capital</i>					

“program” until 2004, although results from certain cluster-specific interventions that developed in response to demand and an emerging strategy to strengthen the cluster can be described. The Montana Manufacturing Extension Center, the Agricultural Extension Service, and the University of Montana Business School have all helped individual companies in various ways—the first with direct assistance to companies, the last with research and information about markets and the industry, and the agriculture extension service with some of both.

Community engagement

The industry is the community in this dense cluster.

Outcomes

Generally, this is a thriving industry with little foreign competition. But there is an ongoing struggle between environmentalists and loggers over how much old growth forest should be removed.

<i>Economic</i>	Increase in sales, with a growing market for homes.
<i>Opportunity</i>	Although there are no explicit social goals, the low educational levels needed to work in the industry allow easy access to the cluster for ambitious entrepreneurs.
<i>Environmental</i>	Mainly negative outcomes due to the energy consumed getting the logs to the manufacturing site and shipping the homes out (prefabricating homes on site, disassembling, and then shipping to locations at what was about \$1 per mile when gas costs were half what they are now). When the Canadian dollar is weak, many companies bring logs from Canada, adding significant energy consumption

26. Paper Products in Wisconsin's Fox River Valley

Description

The Fox River Valley in Wisconsin is home to the world's largest concentration of paper mills and is the number one paper-producing region in the nation. In fact, the region has been called the "toilet paper" capital of the world. Local firms employing some 46,000 people contribute to the state's overall production of 5.3 million tons of paper each year. The cluster offers the highest paid occupations in manufacturing in the state—about 60 percent above the state average.

Origin

The region's papermaking tradition began in 1853 in Appleton (pop. 70,217) with a rag-paper manufacturing mill. Two decades later, Colonel H.A. Frambach, a Civil War veteran, revolutionized the industry by utilizing Germany's Keller ground-wood process, a procedure that allowed paper to be made from wood pulp. Frambach and his brother opened their first mill, Eagle Mill Flour and Paper, in Kaukauna (pop. 12,983) in 1872. This mill acted as a catalyst for the cluster's growth, and it still exists today. After undergoing numerous rounds of technology upgrades and product diversification, contemporary firms produce high value-added products like tissue, specialty paper, paperboard, printing paper, and writing paper.

Location

The Fox River Valley lies along the eastern and central portion of Wisconsin just south of Green Bay.

Eight mills are located along the Lower Fox River, the portion that connects Lake Winnebago to Green Bay, and 12 are located along the Upper Fox River.

Associational infrastructure

In 1950, the Wisconsin Paper Council was established as a trade association to represent the state's pulp, paper, and allied industry in public affairs and government relations. The council also has a role in disseminating information and acting as a center for the exchange of ideas. Appleton's Institute for Paper Chemistry (later called Institute for Paper Science) was founded in 1933 as a center for pulp and paper research. The Institute was a strong regional asset until it was recruited in 1988 (with incentives from the state) to Georgia Tech University.

Development

The region is ideal for the manufacture of paper products due to its abundance of trees, fresh water, and hydrological power. These geographic features—in addition to the region's proximity to printing and publishing industries and the ready supply of skilled labor—allowed papermaking companies to thrive and increase their strategic advantage over international competitors.

The creation of the Institute for Paper Science was the industry's response to environmental problems created by sulfide byproducts.

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					X
<i>Training</i>			X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					X
<i>Marketing</i>					
<i>Capital</i>					

Interventions/support

Paper is one of 10 clusters that the state of Wisconsin identified in 2003, but the state offered no additional funding, just the promise of setting priorities for existing programs. The state Department of Commerce appointed a cluster coordinator to facilitate communications among companies and serve as a liaison with the government. The University of Wisconsin-Stevens Point offers undergraduates a bachelor's of science in its Paper Sciences program. Historically, about half of the program's graduates work in the state's industry.

Community engagement

None mentioned.

Outcomes

Firm consolidation and mergers have resulted from a number of economic challenges, i.e. increased competition from foreign competitors, outdated technology, economic recession, and dampened demand.

<i>Economic</i>	Some firms are cutting back on high-wage (\$17/hour) jobs. Industry experts expect firms to reclaim the regional market as energy prices drive up transportation costs.
<i>Opportunity</i>	The workforce is highly skilled, although most jobs do not require college degrees.
<i>Environmental</i>	The use of recycled materials is growing, and firms are working with the government to reduce the amount of pollutants in the Fox River. The local community has advocated for the reduction in contaminated sediments like PCBs dumped in the river.

27. Houseboat Manufacturers on Lake Cumberland, Kentucky

Description:

The cluster builds high-end luxury houseboats and has about four-fifths of the national market. Eleven firms build “full aluminum hull” houseboats with many “home-like amenities.” Most firms are moving towards building larger, customized, and more luxurious houseboats. The cluster is thought of as “the most significant for the industry,” since it has the largest agglomeration of firms. The cluster also includes firms making high-end wood furnishings and cabinetry and precision metal working for repairs.

Origin:

The cluster began in 1953 with Somerset Houseboats and developed as a homegrown cluster almost entirely dependent on local entrepreneurs and local capital. Before that, the economy was mainly agricultural. After Somerset closed temporarily, a former employee and several partners started their own firm, Stardust, which has spun-off several additional start-ups.

Location

The cluster is located in a very poor four-county area—Clinton, Pulaski, Russell, and Wayne—in southcentral Kentucky. The region is situated on the western edge of the Appalachian Mountains and on the banks of Lake Cumberland, one of the 10 largest lakes in the U.S. The total four-county population was 105,072 in 2000.

Associational infrastructure

Although all of the firms are locally owned there are no networks or associations due primarily to the fact that competition among owners has created a highly competitive environment (for employees and markets) with no room for collaborations. In fact, the biggest impediment for the cluster has been lack of trust and strained relations between firms. Litigation among firms is common.

Development

As the cluster gains visibility, economic developers are increasing efforts to foster more collaborative projects amongst firms and support entrepreneurial ventures.

The firm’s location near Lake Cumberland (which fueled demand), familial relationships, and work-force skills acquired on the job spurred the cluster’s growth.

Interventions/support:

When the state of Kentucky was supporting manufacturing networks, it created a program at the Center for Rural Development at Somerset Community College to encourage collaboration in training among companies. Although the educational alliance did not develop as hoped, houseboat firms employ graduates from local welding and industrial maintenance programs. The National Marine Manufacturers Association started a houseboat committee to focus manufacturers on issues of

	State Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>	X				X
<i>Training</i>	X		X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>					
<i>Capital</i>		X			

mutual concern (i.e., participating in a cooperative/apprenticeship training program, exploring joint purchasing, and developing a shared/collective vision for the cluster). In addition, the federal government designated Empowerment Zones within the counties, an action that has made subsidized loans from venture capital funds and federal tax credits (\$3,000 each) accessible to a limited number of firms.

The Bluegrass State Skills Corporation has played a key role in funding worker-training programs, and Somerset Community College offers continuing education classes to houseboat firm employees.

Community engagement

The only temporary engagement has been through the Rural Development Center at the Community College, which had state funding to work with the companies collectively.

Outcomes

Although the cluster had been very successful for many years, the recession was particularly bad for the luxury boat market. According to one owner, it was “like someone turned off the fountain.” Orders were down and they were laying off employees. Their recovery may depend on their ability to find new products and markets.

<i>Economic</i>	The goals of this cluster are purely economic. It is dependent upon continued growth of highest end markets.
<i>Opportunity</i>	Wages are relatively low for the skills required.
<i>Environmental</i>	Only if demand for “green” boats develops. Both shipping the boats to their final delivery sites and operating them consumes considerable fuel.

28. Pencil Manufacturing in Middle Tennessee

Description

In the 1950s, Governor Buford Ellington declared Shelbyville, “Pencil City, U.S.A.” Lewisburg, located about 20 miles west of Shelbyville, is widely recognized as the “Pencil capital of the world.” Local pencil makers manufacture a diverse assortment of high-end art pencils, designer pencils and writing instruments that are used for schools, offices, and specialty advertising. The cluster employs more than 3,000 people and is capable of producing lead filler, imprinting advertisements, and packaging the final product.

Origin

During the late 1800s, pencil manufacturers in northern states identified middle Tennessee as a place to open wood mills to gain access to the Eastern red cedar market. In the 1894, the American Lead Pencil Company opened the first mill in Lewisburg, Tennessee. Colonel James Musgrave opened the first mill in Shelbyville 20 years later. Both companies served as anchors for the pencil manufacturing industry in their respective cities, but Musgrave put forth considerable effort to establish a cluster in the region. After enduring years of prohibitions for imported German lead filler during World War I, Musgrave set his sights on developing the industry to the point that the entire wood-cased pencil production could take place in Shelbyville. During his tenure as head of Musgrave Pencil Company, Musgrave nurtured the establishment of other local pencil manufacturers and the specialty advertising imprinting industry.

Location

Lewisburg (pop. 10,698) is located in Marshall County and Shelbyville (pop. 16,105) is located in Bedford County. Both cities are located in the southernmost portion of middle Tennessee, and both are manufacturing hubs in the cluster. The towns are less than 100 miles from Chattanooga and less than 40 miles from the Tennessee-Alabama state border.

Associational infrastructure

There are no formal networks, but the establishment of a strong value chain in Shelbyville has allowed local firms to develop strong informal ties.

Development

While establishing the cluster, Col. Musgrave, the founder of the Musgrave Pencil Company, sought to establish and nurture close-knit relations among manufacturers.

Middle Tennessee was an ideal choice for pencil manufacturers in the early 1900s due to the abundance of red cedar forests, the growing manufacturing industry, and the Louisville & Nashville Railroad. In the early 20th Century, both domestic and international pencil makers preferred the “aromatic, splinter-resistant” red cedar wood for quality pencil casing. Around the same time, Shelbyville and Lewisburg were considered important stops on the Louisville & Nashville Railroad line.

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					X
<i>Training</i>					
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>		X			X
<i>Capital</i>					

Interventions/support

Although some of the firms are locally owned, nearly all manufacturers rely on the national government and national trade associations to promote their interests.

Community engagement

None mentioned in articles or websites.

Outcomes

The cluster has substantially decreased in size since the early 1990s due to strong competition from low-priced imports produced in China and Thailand. In addition, manufacturers nearly exhausted the local supply of Tennessee red cedars by the 1930's. Thus, local firms have turned to Californian forests to procure incense cedar, identified as a "fast-growing, plentiful, and renewable substitute" for pencil casing.

<i>Economic</i>	Most manufacturers either closed or consolidated during the early and mid-1990s. The Newell Company, a large, diversified manufacturer of home and office products, acquired three pencil companies with firms in the area.
<i>Opportunity</i>	Unknown
<i>Environmental</i>	Colonel Musgrave devised one of the most successful recycling strategies when Musgrove Pencil Company first opened, making pencils from recycled cedar fence posts. Other notable recycling schemes included the invention of pencils created from reprocessed newspaper and cardboard boxes in 1992 and "sustainable yield" wood in 1993.

DURABLE GOODS MANUFACTURING

29. Metal Manufacturers in Western Minnesota

Description

The cluster is composed of about 110 manufacturers, most of who specialize in some form of metal fabrication or assembly.

Origin

The origin of the metals cluster was a need to find something to replace the gradual but steady loss of agriculture. No information is available about the first companies, but they most likely were companies that provided parts and supplies for agriculture or farmers with strong mechanical skills. The group of metal companies self-identified as a cluster in the late 1980s when a half dozen manufacturers recognized a need to have a forum to discuss common problems and opportunities and decided to organize an association.

Location

The cluster covers an area that has about a 75-mile radius in western Minnesota, with Fergus Falls near the center and extending across the border into North and South Dakota. Distance is not a barrier for these companies, whose owners are willing to drive long distances to meet.

Associational infrastructure

The Tri-State Manufacturers Association (TSMA) was formed in 1989 with a small grant FROM the West Central Initiative Fund (WCIF). The organiza-

tion grew from 55 members, when it first received its grant, to more than 200. It hired a full-time director and assistant, who set out to identify new markets and products but after the grant expired, decided not to support a full-time director. It is still active, however, twenty years later. TSMA, headquartered in Elbowlake (pop. 1194) holds social events, conducts plant tours, and offers workshops.

Development

The growth of the organization was part of a systematic foundation effort to support networking and cooperation among rural SMEs within the larger goal of strengthening rural economies and creating opportunities for youth.

The companies were too far from the Twin Cities, the center of the state's economic power, to develop the relationships and find the assistance they needed. Their isolation was the main reason for organizing. When they received their WCIF grant, a survey of members about the value of the association placed learning from one another first, above joint activities like finding new markets and developing new products.

Interventions/support

Following a startup grant, the TSMA received a \$300,00 three-year grant from the Northwest Area Foundation to support the association and encourage more networking among members.

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>				X	
<i>Training</i>			X	X	
<i>Services/Entrepren.</i>				X	
<i>R&D/T</i>					
<i>Marketing</i>				X	
<i>Capital</i>					

Community engagement

The association meetings are public meetings, originally held at the Elks Club, attracting people from across the community.

<i>Economic</i>	The TSMA led to a number of collaborative activities, including the development of new products, joint marketing at trade shows, a purchasing network, and joint ISO 9000 and other technology training at Alexandria Technical College.
<i>Opportunity</i>	The only social outcome has been the indirect strengthening of isolated towns with high unemployment rates and outmigration of young people. TSMA is a leader in the national “Dream It, Do It” campaign to increase youth employment opportunities. There have been no measures, however, of the long-term effects on unemployment and outmigration.
<i>Environmental</i>	In the 1990s, when the available research was conducted, sustainability was not a concern for these firms.

30. Toys in Ibi, Spain

Description

The cluster consists of about 85 manufacturers of mostly plastic children’s toys. Its major competition in Spain comes from the Basque region.

Origin

Around 1900, when the population of Ibi was only 3,000 people, the original company in the cluster, Paya Hermanos, was a small tinsmithy firm that made toy dolls and supplied ice cream companies. In 1910, it produced the first toy with a spring mechanism. Two years later, when the firm produced a successful tin toy horse and cart, it turned to manufacturing a range of miniature products for children and soon expanded to employ 100 workers. That first toy cart today is commemorated by a statue in the town, along with a separate statue commemorating the early ice cream makers of Ibi. A second toy company, Rico S.A., soon followed, and the cluster grew as employees in turn founded new companies to produce different types of toys. During these early years, the toy firms traveled to Germany to buy toys that they could imitate and then adapt for sale to Spanish markets. During the Spanish Civil War, the companies were socialized and temporarily turned to making military products. After World War II, a shortage of metals caused the firms to convert to plastic materials and manufacturing technologies.

Location

The city of Ibi (pop. 22,000) is located in the mountainous Province of L’Alcoia in the central part of the region of Valencia in southeastern Spain.

Associational infrastructure

Ibi is home to an office of AEFJ, the Spanish Association of Toy Manufacturers. The Toy Technology Center also brings businesses together for collaborative projects. The city also supports an Entrepreneurs Association that includes other sectors but gives new and prospective toy companies a chance to learn from one another. In addition, the local culture supports a high degree of informal socialization.

Development

The cluster grew on its own accord, largely as a substitute for poor agricultural performance. Over the past two decades, government programs have been enacted to strengthen Valencia’s clusters, particularly with regard to technology adoption and training. The Office for Economic Promotion works to attract additional companies to the cluster. The city, which is known as “Spain’s Toy City and is home to a famous toy museum, often uses the cluster to promote tourism.

The initial impetus for the cluster was to convert an existing competence, tinsmithing, to a new set of products and different markets. The cluster had to overcome its distance from raw materials, poor communications (there was no post office until 1925), and very low levels of education.

Interventions/support

In 1986, the regional development agency IMPIVA (Institute for Small and Medium Valencian Industries) supported a Toy Technology Center

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>	X				
<i>Training</i>	X		X		
<i>Services/Entrepren.</i>	X				
<i>R&D/T</i>	X				
<i>Marketing</i>					
<i>Capital</i>					

(AIJU) as part of a larger program to support technology centers and networking for industrial districts similar to those in Emilia Romagna. The government- and member-supported Center provides training, technical assistance, technology diffusion and a toy-testing laboratory. It also publishes a catalog of the city's toy products. In Valencia a board of 10-13 regional entrepreneurs, plus representatives of IMPIVA and the regional or national government, govern such Centers. In 1992, local consultants were trained to facilitate networks among toy manufacturers, and a subsequent evaluation by IMPIVA showed that six networks had formed and were awarded grants for joint activities. Because of the intensely competitive nature of the industry, firms must continually innovate and develop new toy designs.

Community engagement

As in Italy, the economy and community are intertwined and the economy represents the community.

<i>Economic</i>	The cluster has been successful, but with increased competition, production and the number of firms have decreased. As a result, the city is seeking ways to diversify its economy. Although the initial success of the cluster was based on cheap female and child labor, work is now more technical and wages relatively high
<i>Opportunity</i>	The city is still quite homogeneous. The apprenticeship program is a pathway for those with little formal education.
<i>Environmental</i>	No information.

31. Ceramic Tiles in Sassuolo, Italy

Description

The cluster is the world's leading producer of ceramic tiles, with 114 firms employing some 20,000 workers. These firms produce about 80 percent of the tiles made in Italy, 75 percent of which are exported. The cluster includes the final tile producers, glazers, design companies and decorators, and engineering companies. The cluster was highlighted as a benchmark in Michael Porter's landmark 1988 study, *The Competitive Advantage of Nations*. Marazzi, the largest company, is part of a consortium of large producers that exerts considerable control on smaller firms and markets.

Origin

The ceramic tile cluster can trace its roots back two centuries to the Rubbiani firm, but it expanded significantly in 1924 when a new firm, Industria Cermica Veggia, introduced a less expensive glazing technology and then replaced that with an even more effective zircon glaze called "Sassuolo White." The firm also introduced a new production process that used pouring rather than pressing. The single-fire process for floor tiles, developed in the 1970s, was another important innovation. Growth most often has resulted from employees being able to buy their own new equipment and start new businesses.

Location

The cluster is centered in the cities of Sassuolo (pop. 20,000) and Fiorano (pop. 15,000) in the Province of Modena in the region of Emilio Romagna in Italy.

Associational infrastructure

The social structure is mainly informal although, it is supported by two important associations: the National Confederation of Artisans, which provides business services, training, and capital, and Assopiastrelle, the cluster's main membership organization, which provides a wide range of services and promotes and markets the companies collectively. Networking is common both among producers and firms in the supply chain to meet large orders. Assocargo is a consortium that coordinates transportation for groups of companies. The cluster is highly secretive about its innovations, however—which protects strategic advantage but cuts off access to other forms of intelligence.

Development

The cluster developed independently of any intentional policy, but when Italy formed regions in 1972, it was the first industrial district to be recognized and supported. This is a communist-governed region that has developed one of the world's leading (and free) childhood education programs. The ready availability of superb red clay was the prime reason for the cluster's early growth. More recently, the robust entrepreneurial climate and the development of automated equipment by engineering firms, particularly the company System, have given the area its competitive edge. System's automated equipment is now used worldwide.

Interventions/support

The regional government supported the cluster through a number of Regional Laws that funded

	Regional Gov.	National Gov.	Public Education	Foundations	Assoc.
<i>Networking</i>					X
<i>Training</i>			X		X
<i>Services/Entrepren.</i>	X				X
<i>R&D/T</i>	X				
<i>Marketing</i>					X
<i>Capital</i>					X

collaborative activities, including the Centro Ceramica Bologna, which is the Ceramic Tile Research and Testing center at the University of Bologna supported by ERVET, the region's economic development agency. Assopiastrelle hosts the largest ceramic tile trade show, Cersaie, which attracts more than 100,000 visitors. Between 1980 and 1987, Assopiastrelle spent \$8 million to promote the cluster's tiles in the U.S. *Tile Italia*, which translates in English as *Ceramic World Review*, is published in Sassuolo (pop. 41,746). Assopiastrelle also provides education and training, technical standards, statistics, and handles labor relations.

Community engagement

The district is the community, and the companies are fully integrated into community life and community politics. All companies are family-owned, mostly by families with deep roots in the community.

Outcomes

The industry today is more concentrated than in the past, with around 30 cases of mergers and acquisitions of large firms into powerful consortia during the past decade. In 1996, 39 firms collectively owned 102 plants. By 1999, the five largest groups in the cluster accounted for about 55 percent of total production. The main foreign competitor for tiles had been Spain. but more recently it is China.

<i>Economic</i>	The cluster faces increased competition from Spain and China, but is still holding on due to branding and early new technologies.
<i>Opportunity</i>	Wages are higher than average in the district. In recent years, however, there has been increasing discrimination against immigrants, which may be adversely affecting the cluster.
<i>Environmental</i>	No information.

32. Plastics in the Berkshires of Western Massachusetts

Description

The diversified plastics cluster in the Berkshires consists of more than 40 companies that produce or support the plastics industries. At its peak, the cluster employed about 3,000 people and generated \$180 million in annual revenue.

Origin

General Electric (GE) has operated in Pittsfield, Massachusetts since the early 1930s, initially manufacturing Bakelite parts for its appliances. Bakelite is a plastic first licensed in 1909, although the first plastics companies in the Berkshires date back to the 19th Century. The cluster's expansion largely was due to entrepreneurial efforts of former employees. Many were employees of GE's Plastics plant in Pittsfield who were downsized in the 1940s and 1950s after the company eliminated mold making and processing from its operations. The new firms both supported the needs of GE divisions in the region (transformer, military, chemical) and served growing new markets.

Location

The cluster is located in the Berkshires, a multi-county region of Western Massachusetts, extending slightly south over the Connecticut border. Pittsfield, MA (pop. 45,793) is the cluster's hub.

Associational infrastructure

In 1986, 43 independent plastics companies (97 percent of the plastics companies in the region)

formed the Berkshire Plastics Network (BPN), which became a widely cited and studied national benchmark for other efforts to develop manufacturing networks. In fact, BPN more closely resembles an industry association than a network, and it also has been studied as a model "cluster." In 1999, BPN members contributed more than 2,000 unpaid hours to supporting the cluster.

Development

The cluster initially emerged through a grassroots industry-driven effort of a handful of companies (Association of Plastics Industries) to address their labor shortage problems by creating an apprenticeship program. This initiative quickly became integrated into the state's official policy to form manufacturing networks and, later, its cluster strategy. Opportunities surrounding GE's plastics division provided the original stimulus, but labor market shortages led to the organization of the companies in the cluster.

Interventions/support

The main intervention was support of the BPN, allowing the plastic firms to determine what kinds of support they needed. Results have included additional trade programs in the schools, seminars for members, a brochure and common web site with a matrix that displays all the members' individual capabilities, and assistance with accessing benefits. The BPN received continuing support from the state's network program plus individual grants, such as \$200,000 from the Commonwealth of

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>	X				
<i>Training</i>	X		X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>	X				
<i>Capital</i>					

Massachusetts in 1992 to attend trade and design shows in order to promote regional development.

Community engagement

The only documented community involvement was through the K-12 school system and close association with the chamber of commerce.

Outcomes

<i>Economic</i>	The cluster has had ups and downs. Today it is smaller in number of companies (about 30 now), but many of these firms are growing. GE auctioned off its plastics unit to a Saudi company, and the implications of that sale are not yet known.
<i>Social</i>	The network, never fully self-sufficient, became overly dependent on grants and disbanded in 2001 when their \$65,000 in state funding was cut in half.
<i>Environmental</i>	No indication of environmental impacts—although personal experience in the past was that the industry can be quite polluting if not carefully controlled (GE’s resins polluted one lake so badly this author never dared to put a hand into it.)

33. Plastics in the Montachusett Region of Massachusetts

Description

This is one of the oldest and most concentrated plastics clusters in the U.S., the site of the origin of celluloid plastics. Leominster (pop. 11,000) was dubbed “Pioneer Plastics City” and “Comb City” in the early part of the 20th Century. In 1930, the Montachusett region also was the center of the first injection molding manufacturing. Massachusetts today has the fourth largest plastics industry in the U.S., with much of this manufacturing located in the Montachusett Region and in the Berkshires. In 2003, the region featured 103 plastics companies employing about 6,700 mold makers, packaging, printing, and other suppliers. This total is significantly less than 150 companies that operated there a decade earlier, but it is still large.

Origin

The plastics cluster originated with the manufacturing of combs in Leominster, originally out of tortoise shell. In the early 1900s, the city began shifting to celluloid and soon became the national center of celluloid manufactured products, especially high fashion design products like jeweled combs. It also became the center for plastic presses, molds, and fixtures. Within this very strong entrepreneurial culture of Italian immigrants, most of the companies were spawned by Foster Grant and Dupont. The cluster quadrupled in size during the 10-year period following World War II. About 95 percent of companies surveyed in the late 1990s indicated that they originated in the Montachusett region.

Location

Montachusett is a 500-square-mile area of North Central Massachusetts. It is sometimes referred to as “The North Region.”

Associational infrastructure

There are no formal associations representing the cluster, but because so many companies are locally owned and the cultural heritage so strong, trust is high and informal networking common.

Development

This cluster is purely industry-driven and has not been a part of any intentional regional or state strategy other than generic development policies. It is, however, part of a tourism strategy centered on the cluster’s rich history. Since 1972, Leominster has been home to the National Plastics Center and Museum, which displays local products including pink lawn flamingos, the Styrofoam cup, and Saranwrap, all invented in Leominster.

Local innovations have driven the growth of this cluster. Examples of such innovation have been the celluloid process, then a patented one-operation die for producing multiple combs, and then injection molding.

Interventions/support

A study undertaken for Massachusetts Governor Weld in 1993 recognized the cluster, but it led to no substantive action. There have been virtually no

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>					
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>					
<i>Capital</i>					

government-supported programs targeted to the needs of this cluster, and, despite the cluster's significant employment, its firms have been largely ignored even by regional technical schools and universities. The large companies do their own training and research, which eventually filters down to the smaller companies.

Community engagement

The cluster is a community, since it represents the community's cultural heritage. Most companies are family-owned and passed down from generation to generation. Company owners and managers are integrated into the larger community.

Outcomes

<i>Economic</i>	The workforce is aging with few new entrants, and the cluster is struggling to compete against lower cost areas.
<i>Opportunity</i>	Unknown
<i>Environmental</i>	Unknown

34. Ceramics in the Salzkammergut, Austria

Description

This ceramics industry cluster includes three industries that produce dishes, china, and ceramics (ornamental). The cluster is best described as a “final-market industry cluster” with design-protected niches. Its products compete in “medium quality/medium price” markets. Firms are known to produce average-quality earthenware dishes with individual traditional designs. These “Grüngeflamtes” display painting techniques that date back to the 17th Century.

It should be noted that regional ceramics companies also produce sanitary fixtures, but those companies do not have strong linkages to the aforementioned firms. Moreover, they rely on completely different production technologies and end markets (i.e. high quality/high price markets).] Most of the china and dishware are sold through established foreign distribution channels, while the ornamental ceramics and sanitary fixtures are exported to regional/selective markets.

Origin

Ornamental ceramics tradition dates back to the 16th Century. As of 1991, only 12 firms that make up the entire traditional industry (established in the early 20th Century or before) still remained in the area. The premier firms in the ceramics industry developed in Gmunden (pop. 13,336) due to the area’s abundance of clay and plethora of salt mines. After approximately 200 years, this fortuitous location allowed for firms to import salts and export products.

Location

The Salzkammergut (pop. 57,000) is a resort area located in Austria. The region includes seven towns: Gmunden (capital of ornamental ceramics), Ebensee, Bad Ischl, Bad Goisern, Bad Aussee, Altaussee, Hallstatt, and numerous other municipalities that are located along Route 145 and on/within close proximity to the Traun River. According to Wikipedia, “the name Salzkammergut means ‘Estate of the Salt Chamber’ and derives from the Imperial Salt Chamber, the authority charged with running the precious salt mines in the Habsburg Empire.”

Associational infrastructure

There are no associations, clubs, or networks, but about 120 firms and artists participate in the annual ceramics market to help maintain Gmunden’s position as the “heart of the Austrian ceramic industry.”

Development

The main strategy involves promoting the industry’s products to tourists and identifying strategies that will allow firms to stay competitive. In addition, Upper Austria has taken a very active role in promoting clusters and has tried to brand itself in its industrial literature as “Clusterland.” The cluster grew as ceramic firms collocated in and around Gmunden. The area’s artisans, natural resources (i.e., clay and salt), and close proximity to the Traun River (which connects to the Danube River) has allowed the firms to prosper for hundreds of years. The area also is a tourist destination.

	Regional Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>	X				X
<i>Training</i>			X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>	X				X
<i>Capital</i>					

Interventions/support

The city council and cultural office in Gmunden work to strengthen connections between firms, promote the industry to tourists, and provide financial resources for collaborative projects. The local museum and educational institutions also serve to educate the public about the history of the industry. Kammerhofmuseum exhibits the history of ceramics in Gmunden, and local tourist offices design tours that feature ceramic businesses. Upper Austria publishes and circulates promotional materials for the ceramics industry. Various educational institutions partner with local artists with primary schools and offer ceramics classes for local residents. The Gmunden City Council funds and promotes projects initiated by the largest firm, Gmunder Keramik, and the Gmunden cultural office organizes the annual ceramics market.

Community engagement

Unknown.

Outcomes

<i>Economic</i>	The cluster must compete against lower-cost areas protected by regional branding.
<i>Opportunity</i>	Open entry to cluster.
<i>Environmental</i>	Unknown

35. Cutlery in Maniago, Italy

Description

Maniago is an industrial district specializing in the production of knives. Approximately 200 enterprises employ 1,000 people and produce 50 percent of all knives made in Italy, with 60 percent exported. Almost half of the companies are artisan firms with only one or two employees, and only six percent of firms have more than 20 employees. About half are final producers, 16 percent components, and 30 percent contractors. In 1999, Maniago was designated an industrial district according to Italian Law n. 27. Half the firms produce finished products; the rest supply or support those firms.

Origin

The region, known for its metalworking capabilities, began producing scythes and axes, and butcher knives in the Middle Ages. In 1435, an artisan began making knives, hooks, and sickles and future generations followed in his footsteps. In the 18th Century, the metalworking shifted to more refined cutting tools like penknives, scissors, dinner knives, and surgical knives. Just before World War I, a German entrepreneur, Albert Marx, built the first industrial factory to produce knives, and it became the model for future factories. The growth in the cluster came from spin-offs by entrepreneurial employees.

Location

Maniago is a district and town (pop. 12,000) located in the foothills of the Province of Pordenone in the Friuli region of Northeastern Italy. It is not easily accessible by any major highway system or near an airport.

Associational infrastructure

The Consorzio Coltellianai Maniago (Maniago Cutlery Consortium) supports the cluster and provides a collective voice for companies and promotes its brand. The regional trade associations also provide a framework for cooperation. Most associational activity, however, is informal, taking place at social and civic events and other gatherings.

Development

The district developed spontaneously, although access to waterpower was an important asset. The district has, however, been included in a national policy to recognize industrial districts as sources of culture and productive relationships and to brand their products as official Italian goods. The town is home to a Cutlery museum displaying and explaining the history of the cluster. The metalworking skills of the local population led to the production of superior cutting instruments, somewhat accidentally. The expertise and experience of residents in the cluster developed over centuries. The town views itself as Italy's "Cutlery City."

Interventions/support

The National Institute for the Promotion of Foreign Trade assists the cluster with finding export markets and marketing. A local technical school provides specialized training in the metal industries for cluster employees and technical staff. The Maniago District Committee plans for the cluster and submits proposals to the Regional Government.

	Local Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>	X				
<i>Training</i>					X
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>	X	X			
<i>Capital</i>					

Community engagement

As in other Italian industrial districts, the businesses and their families comprise the community, and firms and residences are intermingled. Businesses are fundamentally engaged.

Outcomes

The cluster is under increasing pressures, but brand identity and design (using designers from across Europe) have helped the cluster to maintain its competitive position.

<i>Economic</i>	The cluster appears to be holding its own despite increased competition.
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<i>Opportunity</i>	The cluster is openly accessible for employees and entrepreneurs.
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<i>Environmental</i>	Unknown
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36. Eyeglasses in Belluno, Italy

Description

This is one of Italy's best-known clusters, with 606 enterprises employing almost 12,000 people producing eyeglasses or parts for them, including 479 small artisan firms. It includes some of the world's most prestigious manufacturers, including Ray-Ban, Luxottica (which acquired Ray-Ban), Safilo, Marcolin, and LensCrafters. These firms produce major name brands such as Gucci, Ferrari, Ralph Lauren, Christian Dior, and Burberry as well as their own name brands. The cluster exports more than 80 percent of its aggregate product.

Origin

The cluster dates back to the 14th Century. In 1878, local artisans built the region's first eyeglass factory. The area did not become a major fashion center, however, until the 1980s when eyeglasses and sunglasses became major fashion statements.

Location

Belluno is a small city (pop. 35,000) located in the Veneto region of Northeastern Italy very close to the Alps and the National Park of the Dolomites. The Piave River provides waterpower.

Associational infrastructure

Much of the associational behavior has been informal, but the system of interfirm networks for smaller firms appears to be in trouble. Most of these firms still use older technologies and share information about their manufacturing methods, but they lack access to the research data needed to compete globally. The cluster is becoming more hierarchical.

Development

There was no special strategy at first, although the cluster is now part of the Italian national system of industrial districts, which protects its brands from European Union imitators.

Competencies in making spectacles that developed over centuries were the main driver for the cluster's rise, but for the most part there were no special circumstances that caused this region to specialize as it did.

Interventions/support

The government created a technical school associated with Padua University, a certification institute, a technology and information center, a research observatory to monitor trends, and an industrial museum to draw attention to the regions preeminence. In 1993, a local Committee of Action composed of private and public sector leaders decided to transform and brand the northern Italian town of Belluno as the world leader for spectacle production.

Community engagement

The cluster is well integrated into the community informally, but there are no special civic relationships.

Outcomes

Although the number of companies has decreased due to outsourcing and competition, this is still a vibrant cluster and it has seemed to stabilize for now. Even so, there is a dichotomy developing

	Local Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>	X				
<i>Training</i>					X
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>	X	X			
<i>Capital</i>					

between the lead and smaller firms that is seen by researchers as unhealthy. The four lead firms account for 70 percent of the revenues, and there is a danger that they will choke off or absorb some of the smaller firms. Some of these larger firms have their own sales outlets, while others have struck distribution arrangements with Sunglass Hut or LensCrafters. Chinese employment in eyeglass manufacturing has grown to 90,000 workers, but the Asian competition targets the low end of the market. Italy still dominates high-end fashion eyeglass production.

<i>Economic</i>	Strong support exists for innovation and growth
<i>Opportunity</i>	Unknown.
<i>Environmental</i>	Ongoing research in nanotechnology may help make production processes greener and products more disposable.

TECHNOLOGY-BASE

37. Wireless Technology in Southeast Minnesota

Description

This cluster comprises electronic component manufacturers, wireless telephone service providers, and regional wireless service providers. The region has a “strong base of engineers and technicians with experience and expertise,” and local firms are cultivating new and creative niches.

Origin

E.F. Johnson, a manufacturer of two-way radio systems, launched his business in 1923 and recruited engineers and technicians who specialized in radio frequency technologies. Eventually these employees branched out with their own firms.

Location

The cluster is located in the southeastern region of Minnesota, centered in the small city of Mankato (pop. 35,000), which is about 70 miles from the Minneapolis/St. Paul metropolitan area.

Associational infrastructure

Informal institutions like the radio club have been important in facilitating networking and social capital among individuals knowledgeable in wireless technologies. In 1992, the Wireless and Communications Technology Alliance formed in order to provide leadership and organizational capacity, but it does not appear to exist any longer.

Development

Although efforts have been made to provide a strong educational infrastructure to foster the growth of the cluster by educating engineers and technicians with an inclination for wireless and communication technologies, there really have been no interventions specifically targeted to this cluster.

Even so, since the first firm opened, the region has managed to cultivate its base of highly skilled engineers and technicians. Firms like Midwest Wireless (founded in 1990) and HickoryTech (founded in 1998 and headquartered in Mankato) started out as independent telephone operators and evolved to become telecommunications specialty firms.

Interventions/support

New alliances and the educational infrastructure have worked to foster the region’s specialized skills base by providing leadership, organizational capacity, producing engineers, and technicians. Local universities and technical colleges have provided the major share of public sector support. Minnesota State University and South Central Technical College provide basic and advanced informational training about wireless technology at the Institute for Wireless Education. The Wireless and Communications Technology Alliance provides leadership and organizational capacity to the cluster.

	Local Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					
<i>Training</i>			X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>					
<i>Capital</i>					

Community engagement
No information is available.

Outcomes

<i>Economic</i>	Evidence for particular economic outcomes attributable to the cluster has not been documented.
<i>Opportunity</i>	Increased social capital may be one outcome of the cluster's development.
<i>Environmental</i>	Unknown.

38. BioScience in Bozeman, Montana

Description

Montana has a diverse and growing life sciences sector. Although without a medical school, Montana has a strong infrastructure that includes several medical/bioscience research institutes, hospitals with research and clinical trials capacity, and a very strong life sciences and related engineering presence within its two major universities. The state also is home to a number of successful start-up and spin-off companies, notably LigoCyte in Bozeman.

Origin

Perhaps the largest influence on the cluster has been the presence of the National Institute of Allergy and Infectious Diseases' Rocky Mountain Laboratories (RML). Completed in 1928, RML has focused on vector-borne diseases such as Rocky Mountain spotted fever and Lyme disease. Now a Biosafety Level 4 research facility, it spawned a spin-off firm that later was acquired by GlaxoSmithKline (GSK).

Location

Bioscience firms are located throughout the state, although most are concentrated in the areas around the major universities. Bozeman (pop. 35,061) is home to Montana State University, while Missoula (pop. 64,081) hosts The University of Montana.

Associational infrastructure

Founded in 2004, the Montana BioScience Alliance serves as a hub for the state's bioscience companies and workers. The Alliance acts as an information clearinghouse and produces a quarterly newsletter,

hosts a variety of networking events and conferences, and acts as an advocacy group for its members. It also acts as the state affiliate for the Biotechnology Industry Organization (BIO). The BIO has grown steadily in the years since its inception and has members throughout the state, although there are also members from the western United States. The Alliance is funded largely by an Economic Development Administration grant, with additional funding by the Governor's Office.

Development

The cluster is bolstered by the Montana BioScience Alliance and also is supported by the Governor's Office. Intensive state support for the cluster began in 2004 as part of a new strategy to pursue cluster-based economic development. Many of the bioscience firms in Bozeman and Missoula are spin-offs from research completed at the universities.

Interventions/support

State government support for the bioscience cluster resulted from a cluster analysis conducted by Regional Technology Strategies, Inc. (RTS) for the governor's Office of Economic Opportunity 2002-2003 that focused on six clusters including bioscience. RTS has provided ongoing support for the cluster since 2004, including assisting with its website, meetings, and publications. The state received a \$15 million grant from the U.S. Department of Labor to support the training needs of the bioscience cluster by creating cluster hubs at technical colleges, but the grant focuses on the more rural eastern region of the state.

	Local Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					
<i>Training</i>					
<i>Services/Entrepren.</i>					
<i>R&D/T</i>			X		
<i>Marketing</i>					
<i>Capital</i>	X	X			

Community engagement

Alliance-sponsored events generally are open to the public, and close ties exist with the post-secondary public education system. Alliance members tend to be relatively active in their communities. One of the goals of the Alliance is to improve and enhance networking in the bioscience community.

Outcomes

<i>Economic</i>	The cluster is growing; the opening of GSK facility may spur other global companies to establish a presence. New, large venture capital funding of a local firm took place in 2008.
<i>Opportunity</i>	Firms face significant barriers to participating in the market. However, they are anxious to attract new employees and offer employment opportunities to native Montanans.
<i>Environmental</i>	Unknown.

39. Mobile Communications in North Jutland, Denmark

Description

The cluster comprises about 35 firms focused upon maritime and mobile communications equipment and employing about 3,900 people. The region developed a strong position as a hub developing software and hardware for mobile phones and maritime equipment. Two local firms were among the first to introduce Global System for Mobile communication (GSM) phones, which is the most popular standard for mobile phones in the world. Numerous multinational companies (i.e., Motorola, Nokia, Siemens, Flextronics, and Ericsson) also have a stake in the region after moving in and acquiring incumbent firms that have struggled with declining markets and limited capital.

Origin

This is a regional cluster that dates back to 1948. SP Radio (now called EuroCon Industries) was the first firm to begin developing maritime radio equipment, because its owner was an active yachtsman. In the 1970s and 1980s, engineers from SP Radio who wanted to start their own maritime communications companies founded numerous spin-off firms. Some eventually branched out into new and growing field of mobile communications and quickly jumped to the forefront of development on the first- and second-generation mobile phones.

Location

Most of the mobile communications companies today are located within a 10-mile radius of Aalborg

(pop. 121,818). The oldest firm, SP Radio, was founded in Aalborg when the population was only about half of its present size. Since 1989, the local science park (NOVI) has been the home for both new start-up companies and the subsidiaries of foreign multinational companies.

Associational infrastructure

In 1997, wireless communication firms came together and partnered with knowledge institutions like Aalborg University (AAU) to establish a formal network called Norcom. Norcom has numerous goals. The most important involve improving business conditions within the industry, fostering cooperative and networking opportunities among managers and specialists, and facilitating industrial growth, business development, and innovation. This association of wireless and mobile industries addresses two distinct fields: Mobile communications equipment/components and maritime communications equipment/components. As multinationals (that rely more exclusively upon their own internal expertise) have entered the cluster, however, cooperation has diminished and networking has lagged.

Development

Many firms have formed extensive partnerships and strong informal ties without the help of formal networks. It appears that the presence of formal associations are a part of a grassroots effort intended to boost horizontal networking. An important compo-

	Regional Gov.	National Gov.	Public Education	Foundations	EU
<i>Networking</i>		X			
<i>Training</i>			X		
<i>Services/Entrepren.</i>	X		X		X
<i>R&D/T</i>	X				X
<i>Marketing</i>					
<i>Capital</i>					

ment of the cluster's growth can be attributed to the spin-offs that were established as a result of management disagreements with parent companies. In fact, the first three firms founded after the opening of SP Radio were spin-offs. In the 1980s, however, a European Union study of the potential of the industry led Aalborg University to target research to it. Expansion in the 1990s came mostly through new investment by foreign multinational companies. As a result of the change in the ownership structure, much of the decision-making power for research and development activities shifted outside of the region, and some of the largest employers now are moving to lower-cost regions.

Interventions/support

The mainstay of support comes from the Aalborg University (AAU), founded in 1972 to provide post-secondary education to the area. Although the area has several technically oriented knowledge institutions, AAU is the most significant contributor to the supply of specialized labor and basic research. Through Norcom, the University has developed courses with help from firms and participated in joint initiatives for promoting the cluster politically. In 1988, the region received a grant from the EU's social fund (NordTek) targeted to lower-income regions to develop an incubator and science park (NOVI) that serves the cluster. In 1989, the region participated in the Danish Network program. Aalborg Technical College trains many mid-skilled technical employees.

Community engagement

No mention of community involvement.

Outcomes

<i>Economic</i>	The region has a small local labor force and high wages when compared to other telecommunications clusters. At present, the cluster is rebounding from the movement of multinationals to lower-cost regions.
<i>Opportunity</i>	The cluster has created opportunities in what was once an economically depressed region of Denmark.
<i>Environmental</i>	No information on cluster-focused environmental outcomes, but Denmark overall has some of Europe's strongest environmental policies.

40. Defense Contractors in Florida's Panhandle

Description

The cluster consists mainly of metals, plastics, and electronics companies that serve the needs and draw upon the technologies of Eglin Air Force Base, Pensacola Naval Station, and various federal labs. The precise number of cluster-related firms and organizations is unknown, but more than 30 have organized into an association.

Age and origin

The origin mainly derives from former military officers who became entrepreneurial defense contractors and consultants in the 1970s and 1980s.

Location

The firms are in and around Fort Walton Beach (pop. 20,000) and Okaloosa County (pop. 182,172) in northwestern Florida.

Associational infrastructure

The Technology Coast Manufacturing and Engineering Network (TeCMEN), formed in 1990, has become the forum for companies to share ideas and develop partnerships for writing proposals. It genuinely serves as a cluster association. Networking forms are distributed at meetings to encourage firms to act collaboratively. Okaloosa-Walton Community College is the other significant component of the cluster's social infrastructure, hosting TeCMEN and regional economic development offices, as well as staging activities that attract cluster members. The college hosts monthly TeCMEN meetings.

Development

TeCMEN arose out of a local effort led by the Economic Development Council and a partner educational institution. Public sector funding opportunities chiefly have driven the development of this cluster, but private enterprises also have been very important.

Cluster development has depended on government contracts and a robust military budget. The real stimulus for collaboration was a major cut in the defense budget in 1991, leading firms to realize they had to work harder to compete

Interventions/support

The primary intervention on behalf of the cluster occurred through Okaloosa-Walton Community College, the main provider of new employees and workforce training for the cluster. In 1990, the college hosted a conference on networks and industrial districts organized by the Consortium for Manufacturing Competitiveness (a project of the Southern Growth Policies Board). Speakers from Italy and Denmark explained the basic concepts underlying successful networking, and the private sector participation at the conference led to the formation of TeCMEN. A resourceful dean was able to obtain funds from the Florida state legislature (its speaker happened to be an employee of the college) as well as a grant from Regional Technology Strategies, Inc. (from the Alfred P. Sloan Foundation) to develop the association's networking activities"

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>	X			X	
<i>Training</i>		X	X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>	X			X	
<i>Marketing</i>					
<i>Capital</i>					

Community engagement

There was no community engagement other than working with the community college—which is a community-based but publicly supported institution.

Outcomes

The cluster experienced a number of economic outcomes as a result of its collective relationships with the federal labs (new products and contracts) and joint marketing and it convinced the community college to offer its first four-year program for the cluster. Social and environmental outcomes have not been evident as issues discussed at cluster events or as goals.

<i>Economic</i>	Through working together collectively, cluster members have been able to leverage each other's strengths to get new contracts, bid cooperatively, design new products together (e.g., a swamp boat), and access the technologies of the federal lab collectively.
<i>Opportunity</i>	The fact that the community college creates a pipeline for a lower-income work force to find jobs is the major social outcome. Networking has become a way of life for the cluster.
<i>Environmental</i>	None known.

41. Electronics in Sønderborg, Denmark

Description

This cluster comprises more than 30 companies plus suppliers (including a dozen software companies), which amounts to approximately three-fourths of the manufacturing base of this small city in southern Jutland. The largest company, Danfoss, employs about 8,000 workers in the region.

Origin

Danfoss, one of Denmark's first, and now largest, electronics firms opened in the region in 1933 and seeded the cluster. Most subsequent start-up firms have been started by the Danfoss' managers and engineers.

Location

Sønderborg (pop. 30,000) is located about 120 miles south of Århus (pop. 302,618) in a region that until 1920 was part of Germany.

Associational infrastructure

Most interfirm association occurs through supply chain relationships, the technical colleges, and informal friendships in a cluster where most companies and managers are local.

Development

The cluster developed on its own, with support the Danish Technological Institute and research centers that was available to all Danish firms. In about

2003, however, Danfoss, which was beginning to outsource more production, contributed about \$4 million to contract with Michael Porter for a cluster study and, ultimately, to plan for diversification into other clusters. One of the results of this project has been the formation of a regional competitiveness council.

Due to the high costs of doing business in Denmark and its relatively small domestic market, companies must compete upon the basis of very advanced skills and continual innovation. They also must operate internationally. This cluster produces high-quality, high-end products and depends upon a very highly skilled labor force.

Interventions/support

EUC-Syd, the local community college worked hand in hand with the cluster to provide training, with students doing their paid apprenticeship periods in the firms in the cluster. In 2005, the region, with support from the largest company Danfos, contracted with Michael Porter for a cluster study, which resulted in the formation of a competitiveness council

Community engagement

The primary engagement is through the associations formed around the new cluster strategies.

	Regional Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>		X			X
<i>Training</i>			X		X
<i>Services/Entrepren.</i>		X			
<i>R&D/T</i>					
<i>Marketing</i>					X
<i>Capital</i>					

Outcomes

<i>Economic</i>	This cluster today is experiencing some decline due to increased outsourcing to lower-cost regions.
<i>Opportunity</i>	National policies ensure access to education and employment.
<i>Environmental</i>	National policies and a very environmentally conscious regional government contribute to positive environmental outcomes.

TEXTILES/APPAREL

42. Carpets in Dalton, Georgia

Description

Often referred to as the “Carpet Capital of the World,” Dalton, Georgia is home to 150 carpet plants and about 100 carpet outlet stores. The local cluster produces about 80 percent of the carpets made in the U.S. and employs more than 30,000 people in the Whitfield County area.

Origin

The carpet industry in Dalton can be traced back to a tufted bedspread given in 1895 as a wedding gift by a teenage girl, Catherine Evans Whitener, to her brother. Five years later, Whitener sold her first bedspread for the sum of \$2.50. By the 1930s, however, domestic demand for these tufted bedspreads had become so great that local women entrepreneurs hired “haulers” to deliver component materials—stamped sheeting and yarns—to front porch workers who manufactured the finished product. Nearly 10,000 such cottage “tufters,” including men, women, and children, were involved in the Dalton area. Income generated by the bedspreads was instrumental in helping many local families survive the Great Depression. Chenille bedspreads became very popular all over the U.S. and provided Dalton with a new nickname: The Bedspread Capital of the World.

Location

Dalton is a small city (pop. 30,000) located in Whitfield County in the Appalachian region of northern Georgia.

Associational infrastructure

The Carpet and Rug Institute, a national organization, is based in Dalton. It offers regular training programs and events. The Institute began as a community effort and still operates collectively, making available a commonly shared website for all the cluster-related firms in the area.

Development

The carpet cluster evolved organically over time from a small-scale, home-based industry to a much larger-scale, automated, mass-production industry. After World War II, Dalton became the center of the new mechanized industry, chiefly due to the fact that mass production still required specialized tufting skills and the city had a ready pool of experienced workers with those skills.

Mechanization ultimately pulled workers from home-based work into the tufting mills. Tufting chenille eventually gave rise to making mats and rugs. Synthetic fibers and more advanced tufting machines allowed Dalton’s mills to mass-produce rugs and carpet comparable in quality to and cheaper than the woven-wool products produced in the Northeast, where factories generally used less efficient and more expensive production techniques. Over time, the Georgia-based cluster has become increasingly automated.

Interventions/support

Dalton State College provides workforce education

	State Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					
<i>Training</i>			X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>	X	X	X		
<i>Marketing</i>					
<i>Capital</i>					

and training, but there have been few targeted interventions. In fact, interventions have been limited to general statewide services available to all manufacturers, independent of their production orientation, such as the services the Georgia Manufacturing Extension Service.

Community engagement

The carpet cluster grew out of a community-based, home-based industry.

Outcomes

The industry today offers a Green Label testing program for carpets and adhesive products to meet criteria for low chemical emissions and help improve indoor air quality. An influx of Hispanic workers that started in the early 1990s has remedied some of the labor shortages.

<i>Economic</i>	Since 1997, cluster employment has risen from about 32,000 to more than 40,000 workers. The cluster also attracts tourists to the outlet stores, creating jobs in that sector as well.
<i>Opportunity</i>	More than half of the students in Dalton's public schools are Hispanic, and Mexico's University of Monterrey brought Spanish-speaking teachers to Dalton to help in the schools and sent Dalton teachers to Mexico to learn Spanish. One firm, however, has been fighting a lawsuit alleging they sought to suppress local wages by hiring illegal aliens.
<i>Environmental</i>	In cooperation with California's Sustainable Building Task Force and Department of Health Services, Indoor Air Quality section, the cluster has voluntarily enhanced its Green Label program for carpet and adhesives.

43. Lace in Lustenau, Austria

Description

The regional textile cluster represents 35 percent of Austria’s textile firms and employees. Almost all of Austria’s embroidery producers—and a sizeable portion of clothing and textile producers—are located in the state. The firms do spinning, weaving and dyeing of textile fibers; they also manufacture knitted and crocheted articles and embroideries. These products all compete in high-quality, high-price markets. The cluster exports about 80 percent of its total textile production, with nearly two-thirds of goods sent to European Union markets. The region is considered a high-wage location. Leading textile firms have worked together to create a cluster trademark, “Made in Vorarlberg,” and high-quality producers of embroidery also use the label “Austrian Embroideries.”

Origin

Textile traditions in Lustenau date back to the 13th Century. The 19th Century saw the introduction of the industry’s first mechanical spinning mills. By the early 20th Century, textile families like Getzner, Hammerle, Rhomberg, and Ulmer modernized the industry.

Location

Vorarlberg is a Bundesland (state) in the very west of Austria. It borders Germany, Switzerland, and Liechtenstein. About half of the firms are located in Lustenau, a small city (pop. 20,500) on the Rhine River. The town is located about four miles west of Dornbirn (pop. 8,150,835), the largest city in

Vorarlberg and the tenth largest city in Austria, and about three hours away by car from Milan.

Associational infrastructure

The cluster does not have a formal club or association. In Austria, however, the chambers of commerce, which require membership, serve that purpose. In fact, the textile cluster has a subgroup of the Vorarlberg Chamber of Commerce called the Stickereiverband. Firms have increased the amount of collaborative endeavors during the last decade. For example, embroidery firms have committed to partner together in shared product presentations, and textile firms contract out production capacity to their competitor firms.

Development

The main strategy involves fostering the textile industry’s creativity, innovation, and rationalization, as well as collaborative efforts among firms. Due to intense international competition from low-wage producers, strict EU regulations, and the lack of support from the state, firms have reorganized and increased collaborative efforts.

Interventions/support

State government support diminished as the cluster declined during the 1980s and 1990s. The local Chamber of Commerce responded by launching small projects to increase cooperation between firms that were undergoing restructuring. The Chamber’s Stickereiverband has helped to increase the competitiveness of the embroidery industry by

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>	X				
<i>Training</i>	X		X		
<i>Services/Entrepren.</i>	X				
<i>R&D/T</i>	X		X		
<i>Marketing</i>	X				
<i>Capital</i>					

uniting high-quality producers of embroidery under the label “Austrian Embroideries” and representing both clients and firms on the international level. In addition, firms joined together to start a textile school initiative (HTL Textil Dornbirn) that offers students grants and workplace guarantee. In addition, the Chamber of Labor organizes workshops on innovation; the Technology Transfer Center Vorarlberg supports research & technology diffusion; the Vorarlberg Institute for Economic Development supplies technical assistance and training; and the Innovative Management Concept Incorporation advises firms on financial aid programs.

Community engagement

Engagement with the community takes place through the Chamber, which operates as a community organization.

Outcomes

<i>Economic</i>	The cluster is still competitive, although declining.
<i>Opportunity</i>	In a relatively homogeneous region, the textile cluster does provide opportunity for small enterprises and part-time employment; wages are high.
<i>Environmental</i>	Unknown.

44. Hosiery in North Carolina's Catawba Valley

Description

About three-fifths of all men's hose made in the U.S. comes from within a 60-mile radius of Hickory. The hosiery cluster is organized as grieger (whites), finishing, and integrated mills, plus many of the suppliers of yarns, needles, and services. Well over 100 companies produce men's socks, from low-end for discount stores to high fashion.

Origin

In the 1930s and 1940s, North Carolina recruited textile and apparel plants to move from the Northeast to take advantage of cheap labor and right-to-work laws. Hosiery plants settled along the Catawba River, including Fruit of the Loom and Sara Lee, which subsequently moved out. Employees of the original branch manufacturing plants started many firms that today are among the roster of locally owned companies.

Location

The Catawba Valley is in the foothills of the Appalachians, on the western edge of the Piedmont. Hickory (pop. 25,000) is the central city in this region of small cities and towns. It lies along Interstate-40, a major east-west highway, and is close to Interstate-81, a major north-south thoroughfare.

Associational infrastructure

The Catawba Valley Hosiery Association formed in 1959 to provide a forum for discussing common

problems, identifying new markets, branding, and training. In 1988, the members were able to lobby the state legislature for support of a Hosiery Technology Center (HTC) at Catawba Valley Community College (even though they did not have the support of the community college system). The HTC also facilitated networking among association members. In 1990, after learning about the success of networks in Italy, they explored networks as a theme for their annual meeting and made marketing and production networks a strategic goal. Such networking also gives companies more leverage with their larger customers. In about 2002, the association renamed itself the North Carolina Hosiery Association to gain political strength and to recognize members from outside the Valley.

Development

This cluster began as an industry effort, but once its success was evident, the state government and community college system recognized it as a replicable model for cluster and workforce development centers. State subsidies, cheap unorganized labor, and access to power were the original reasons for the formation of the cluster. It also was part of a larger textile apparel cluster that was recruited into the Carolinas, Alabama, and Georgia.

Interventions/support

The most important support in the clusters evolution was that which materialized for the establishment of the HTC at Catawba Valley Community College, for both training and demonstrating new

	State Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>	X			X	X
<i>Training</i>		X	X		
<i>Services/Entrepren.</i>	X				
<i>R&D/T</i>	X	X	X	X	X
<i>Marketing</i>	X				
<i>Capital</i>					X

technologies to small and medium-sized manufacturers (SMEs). In 2007, the state legislature finally authorized continuing support for the hosiery center. It received grants from the state to form a network and develop a strategic plan. In 1996, a grant from the German Marshall Fund allowed 15 owners and others to travel to Castel Goffredo and Carpi in Italy to observe industrial districts, which resulted in the redesign of the HTC to include a testing lab, quality standards, design capabilities, and new connections to the Italian machine builders. The state industrial extension program provided an engineer assigned to the cluster. A U.S. Department of Labor grant helped train immigrant workers.

Community engagement

The cluster engages with the community and takes its civic responsibility seriously. The association has social events and invites others to the meetings. One key to its success is its familiarity with the community, which helps firms secure loans from local banks.

Outcomes

The cluster has been hit hard by pressures from big box retail outlets to cut prices and take back unsold goods. It has must now compete against new foreign competition from Chinese clusters, where a single city, Datang, produces nine billion pairs of socks a year. North Carolina’s industry response has been to move upscale and develop niche products, such as Thurlo’s action socks or the colorfully mismatched socks marketed in collaboration with the “Sock Lady” of South Stafford, Vermont.

<i>Economic</i>	Cluster members work together to meet challenges and hold own against foreign competition, but there has been some attrition and consolidation. Anticipating the decline in textiles, the HTC became a more general technology center.
<i>Opportunity</i>	The cluster educates and employs immigrant workers, striving to help them to find career paths.
<i>Environmental</i>	The clusters tests and certifies its products as free of formaldehyde, which is used in the manufacture of most imported socks.

45. Hosiery in Castel Goffredo, Italy

Description

Castel Goffredo, Italy is the center of Europe's largest women's hosiery (calza) cluster. More than 200 companies produce about 70 percent of all women's hosiery sold in Italy and 40 percent all such products sold in Europe. However, foreign competition has cut into the cluster's markets. In the larger region of Mantova (pop. 46,372), about 400 firms (half in Castel Goffredo) employ 6,000 workers in all phases of production (knitting, dyeing, packaging, marketing) and turn over 932 million Euros per year in addition to the supply chains. The equipment producers, a key competitive advantage, also were nearby, in Brescia. The region has its own brand, or mark and is well known for its high fashion hosiery

Origin

The area was agricultural in the early 1900s but near the silkworm industries of Mantova. In 1927 Noemi, a German firm, moved to Castel Goffredo to make hosiery. By 1930 it employed 300 people. In the economic crisis after World War II, residents were able to buy cheap equipment from the now struggling machine builders. Many of them, aided by a Rural Cooperative Bank and local farmers, started their own companies and undercut Noemi's prices. After Noemi went out of business in 1962, employees bought the equipment and started even more companies.

Location

Castel Goffredo (pop. less than 8,000) is located in the Province of Mantova in Lombardia, Northern

Italy. The nearest "big" city is Castiglione (pop. 15,000), and it is not located near any transportation hubs or major highways.

Associational infrastructure

The cluster has a tight but informal social structure, as many of the owners' are former classmates and even relatives. Owners joined together in 1985, for example, to conduct a joint needs assessment that led to the creation of a new technology center.

Development

The cluster's rise has been almost entirely entrepreneurially driven, taking advantage of local skills, access to technology in Brescia, and emerging market opportunities.

Proximity to the silkworm cluster, the investment and subsequent closure by a German hosiery manufacturer, and an economic crisis all contributed to the development of the cluster. The cluster's big break, however, was the new miniskirt styles in the 1960s, which created a very large new market for pantyhose and stylistic stockings.

Interventions/support

Regional policies boosted the cluster by providing infrastructure, promoting the reuse of old buildings, and a government-supported Center for Education, Innovation, and Training that provides short 200-hour courses and longer 600-hour courses for graduates of secondary schools. In 1985, business leaders recognized the need for cluster-wide

	Regional Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					X
<i>Training</i>	X		X		
<i>Services/Entrepren.</i>					X
<i>R&D/T</i>	X				X
<i>Marketing</i>					
<i>Capital</i>	X				

standards and a local Rural Cooperative Bank built a new Centro Servizi Calza (Center for Services for Hosiery) for the cluster to conduct tests, set quality standards, certify products, and support fashion design and information. The regional government purchased the equipment, and trade associations paid membership fees. One of the largest firms, Golden Lady, has become a major player in North Carolina's hosiery cluster.

Community engagement

Because this cluster is so dominant, it in effect represents the community. There is some hierarchal class structure, however, and immigrants are not represented.

Outcomes

The major competition previously from Turkey and South Korea, but now China has entered the picture. Even so, the cluster views China as a market opportunity with 100 million potential affluent buyers and already has set up a Lombard hosiery district in Shanghai.

<i>Economic</i>	The cluster depends on its technology, fashion, and style, with the capacity to make rapid changes in its product line.
<i>Opportunity</i>	The unions in Montova and Milan have claimed that young local women and immigrants are being recruited into low-wage, dangerous, repetitive jobs. However, organizing efforts have failed.
<i>Environmental</i>	New firms are encouraged to reuse old buildings. Centre Sevizi Sheath verifies the perfluorooctane sulfonates (PFOS) content of manufacturing materials

46. Shoes in Sinos Valley, Brazil

Description

In 1995, there were 1,800 firms employing about 150,000 workers in the footwear cluster of the Sinos Valley, which is located in the southernmost Brazilian state of Rio Grande de Sul. The cluster includes aspects of the value chain from the tanners, chemicals, truckers, equipment manufacturers, and designers to the distributors. In the mid-1990s, the cluster annually exported about \$1 billion of shoes.

Origin

Between 1940 and 1950, the number of shoe companies in the area doubled and, in the 1960s, some grew large enough to become major exporters. It was a very poor region with limited capital, but some of the largest companies formed partnerships with entrepreneurs. Much of its growth has been the result of cooperation and trust, with established companies helping new start-ups (often relatives and friends). These larger firms freely shared their knowledge and resources to help build up the cluster

Location

The small towns of the Sinos Valley, located within about a 35-mile radius of Novo Hamburgo (pop. 250,800), constitute the heart of the cluster.

Associational infrastructure

The Sinos Valley is home to six industry associations—shoe producers, tanners, machinery suppliers, export agents, component manufacturers, and

general businesses—and two professional associations that support the cluster. The informal social structure among the German-Brazilian population that allowed free exchange of knowledge in the earlier period became more structured with growth.

Development

The cluster's origins derive from a private sector initiative but scaling up its size was part of a national and regional strategy that built the support infrastructure which eventually allowed the cluster to react favorably to customer pressures for lower costs and Chinese competition.

The formation in the Sinos Valley of an industrial community promulgated mainly by German immigrants drove the growth of the cluster. By the 1960s, the community was aware both that it was creating a powerful economic sector and that the companies were mutually interdependent, so that any tendencies toward intra-cluster competition were tempered by the shared desire for collective growth.

Interventions/support

The government played a major role, starting the SENAI School of Shoe Design and Manufacturing in 1947, a shoe fair (FENAC) in 1963, a tannery school in 1965, a technical school in 1966, and a Technology Center for Leather, Shoes, and Related Industries in 1966.

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>		X			
<i>Services/Entrepren.</i>		X			
<i>R&D/T</i>		X			
<i>Marketing</i>		X			
<i>Capital</i>					

Community engagement

There is no evidence of cluster engagement with the wider community. The roots of the cluster came from German immigrants who never fully integrated into the Brazilian culture. The strongest community involvement came from the immigrant community.

Outcomes

In the early 1990s, tariff reductions and the market entry of Chinese footwear reduced regional investments and the number of tanneries, component producers, and machinery and equipment manufacturers. While firms were going bankrupt, exporting agents left the Sinos Valley. Once the initial impact of the crisis had passed, the Sinos Valley rebounded through market diversification and a change in business culture. Businesses turned to the Latin American and Brazilian domestic market. They also invested in product development, constructed their own identity (brand), and made logistical improvements. Increased managerial training and trade promotion, more participation at selected international trade fairs, and a permanent footwear showroom in Miami in April 2001 all helped. The machinery, equipment and component manufacturers also have invested in marketing and promotion and recently launched the brand “By Brazil.” At last notice, the tanneries were thinking about introducing a quality seal. A supply chain program for the leather and footwear industry in operation since 1999 now has 167 firms.

<i>Economic</i>	The cluster enjoys a new level of stability after responding effectively to foreign competition
<i>Opportunity</i>	The cluster still offers opportunities for entrepreneurs, but it is not known how the native population is faring.
<i>Environmental</i>	No evidence.

TRANSPORTATION EQUIPMENT

47. Heavy Lift Helicopters in Southern Oregon

Description

Oregon produces about 90 percent of the nation’s heavy lift helicopters, an industry that has become a \$1 billion industry for the state. The cluster employs about 3,000 workers. About 75 percent of its revenues come from out-of-state.

Origin

The heavy lift helicopter cluster began in the early 1970s as a response to the needs of the wood products industry—specifically, to lift logs out of forests in difficult terrain. These helicopters specialize in their ability to lift 5,000 or more pounds. Operating and maintaining them require highly specialized skills.

Location

Although the cluster exists statewide, most of the actual manufacturing is found in southern Oregon. Three large companies are located in the Willamette Valley, four others in Jackson and Josephine Counties—in Central Point (pop. 16,000), White City (pop. 5,000), Grants Pass (pop. 29,000), Aurora (pop. 8,984), Corvallis (pop. 49,000), and McMinnville (pop. 30,000).

Associational infrastructure

A Heavy Lift Helicopter Consortium organized with state support has led to many cooperative practices,

including firms sharing vendors for common needs like fuel and addressing regulations.

Development

Cluster growth undoubtedly is connected to the Northwest’s large wood products industry and its need to move large quantities of lumber out of difficult terrain. However, the cluster is having difficulty with recruiting employees to rural areas. Partly as a consequence, firms are looking to the state for support. A few companies are beginning to move some operational functions to Dallas, Texas, a city viewed as having a more supportive business climate with less regulation. The helicopter manufacturing cluster also faces growing competition from China.

Interventions/support

The major intervention has been special education and training programs at Rogue Community College in Grants Pass and Medford—specifically, a 30-month apprenticeship program for airframe and power plant technicians. The program includes job shadowing in the companies, a workforce development need identified by and implemented as an industry consortium, not individual firms. It is supported by a grant from the Governor’s set aside of the Workforce Investment Act. The Consortium markets itself as an industry, not as individual firms.

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>	X	X			
<i>Training</i>		X	X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>					
<i>Capital</i>					

Community engagement

There is little direct community engagement, other than realizing the reliance of the community on this cluster.

Outcomes

The heart of this cluster is not the small, locally owned company and its industry leaders are not wedded to the region. This, it's future depends on the ability of the region to provide the workforce and business climate it needs in an increasingly competitive industry.

<i>Economic</i>	The cluster's economic outcomes continue to be strong but facing increased competition.
<i>Opportunity</i>	To the extent that regional workforce boards are working to upgrade the skills of the local work force, the companies pay very good wages.
<i>Environmental</i>	There is no indication of any consideration of sustainability or environmental concerns. Most members want fewer regulations, the cluster needs large volumes of fuel, and the market depends on increased logging.

48. Recreational Vehicles in Lane County, Oregon

Description

This is a small cluster of companies manufacturing recreational motor vehicles (RVs). In fact, Lane County, Oregon (pop. 343,591) has the second-largest concentration of RV manufacturers in the nation, and all of its manufacturers build world-class luxury motor coaches. In its peak in 2005, the cluster employed almost 5,000.

Origin

This mini-cluster began in 1968 when three men in Junction City, Oregon pooled their wealth and founded Monaco Coach. They originally named their new firm “Caribou Coach,” and it started as a pick-up camper manufacturer. Country Couch was founded five years later, after Bob Lee broke with his original two partners from Monaco Coach. Other new spin-off firms soon followed, despite relatively high start-up costs.

Location

Lane County, Oregon is a metropolitan county because it contains Eugene (pop. 137,893) and Springfield (pop. 52,864), but 90 percent of the county is forested. All three major firms are located within 10 miles of one another, close to Interstate-5. Country Coach is headquartered in Junction City (pop. 4,721), while Marathon Coach and Monaco Coach are located about 10 miles away in Coburg (pop. 959).

Associational infrastructure

The RV consortium—which includes three motor coach manufacturing companies, the Lane Workforce Partnership, and Lane Community College—was established in 2005. Although the main goal of the consortium is to promote workforce development projects, other goals include building trust amongst firms, allocating grant funds from the Governor’s office, identifying common needs and interests, facilitating talks between public partners and the RV firms, and organizing joint projects like career fairs.

Development

When the Governor used his discretionary set-aside Workforce Investment Act (WIA) funds to retain Country Coach, he stipulated that the RV manufacturers had to join an industry-training consortium in order to receive the grant monies. At the time, no mechanism or inherent trust existed that would allow the manufacturing firms to work together collaboratively. Moreover, all of the companies had been struggling to recruit and retain workers.

The Governor’s grant served as the impetus for the development of the consortium, but the industry’s struggles with staffing challenges (i.e., recruiting and retaining workers) and workforce challenges (i.e., changing technologies and demographics, globalization) also were strong motivating factors.

	State Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>	X	X	X		
<i>Services/Entrepren.</i>					
<i>R&D/T</i>					
<i>Marketing</i>					
<i>Capital</i>					

Interventions/support

After the Governor committed part of a \$500,000 grant to the development of a consortium, the Oregon Economic and Community Development Department and the Lane Workforce Partnership met to lay the groundwork for the RV consortium. They designed consortium to focus on numerous issues, but its primary focus concerned the industry's workforce needs, as that was needed to prevent other RV manufacturers from leaving. The Governor's office has funded the RV industry consortium; Lane Community College hosts career fairs and offers expertise in business development; and the Lane Workforce Partnership serves as fiscal agent and convener.

Community engagement

The founder of Country Coach plans to open "Country Coach University," where employees, dealers and customers will be able to learn more about how to build, sell, and service RVs.

Outcomes

The alliance has "created a unified voice to address workforce and training needs," "lower training costs due to bulk buying power, resource sharing, and the sharing of collaborative information," "increased public awareness and visibility," "stronger partnerships and increased collaboration" (i.e., faculty, counselors, students, career centers, high schools, community colleges), and has changed perceptions about manufacturing jobs. The high fuel prices and then the recession, however, have hit this cluster very hard and it is now struggling to survive.

<i>Economic</i>	The cluster had been very successful until the recent economic downturn. The cluster is expecting support from the 2009 economic stimulus package
<i>Opportunity</i>	The local workforce and economic development agencies have been working to train disadvantaged workers for employment.
<i>Environmental</i>	Unknown.

49. Automotive Manufacturing in Northern Alabama

Description

Daimler Benz, Honda, and Hyundai anchor this automotive assembly and supplier cluster in northern Alabama. The northern part of the state has about 150 suppliers for transmissions, exhaust systems, stamping and casting, and engine parts and components. It also has specialized support services, training, and associations.

Origin

Daimler Benz opened its plant in Huntsville in 1998, and Honda opened its plant in rural Lincoln in 2001. Although both were heavily recruited and received large subsidies, the basis for the cluster already existed in the state's older steel and metalworking cluster and engine assembly plants. Each employs well over 1,000 workers and buys from dozens of small local second- and third-tier suppliers. For years, Birmingham and the surrounding counties had been 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 nonetheless retained a large number of metalworking companies.

Location

The cluster is located in northern Alabama, in and around assembly plants in Huntsville (pop. 171,327) and Lincoln (pop. 4577), but with additional firms and a Hyundai plant in southern Alabama. Its proximity to assembly plants in

Tennessee has generated a base of experienced suppliers.

Associational infrastructure

The industry is not organized locally around automobile manufacturing, although there is a very active Alabama Automobile Manufacturers Association that has 462 members, a strong committee structure, conducts study tours, and holds quarterly meetings. There is some organizational activity around the German and Japanese cultures that are associated with the two assembly plants.

Development

This was a well-orchestrated and funded state effort to build the cluster that earlier had failed in its efforts to land a Saturn plant. Local development offices, community colleges, and the University of Alabama were all part of this effort. It represented a planned, coordinated, and heavily subsidized (state and local) strategy to become the automotive center of the nation.

Interventions/support

The state offers specialized training programs (Alabama Industrial Development & Training), and the community colleges offer credentials that prepare workers for more advanced positions. Gadsden Community College has an Advanced Manufacturing Technology Center that has been instrumental in attracting companies. Currently, Lawson State Community College, a historically

	State Gov.	National Gov.	Public Education	Foundations	Private
<i>Networking</i>					X
<i>Training</i>	X	X	X	X	
<i>Services/Entrepren.</i>	X	X			
<i>R&D/T</i>		X	X		
<i>Marketing</i>					
<i>Capital</i>	X				

black college, is establishing the Alabama Center for Automotive Excellence, which will open up opportunities for minorities from surrounding rural areas. The state provides manufacturing assistance through the manufacturing extension program at the community colleges and universities, as well as targeted business assistance.

Community engagement

The business community is heavily involved but not the larger community and not the rural communities. It has been driven largely by the economic development agency

Outcomes

Alabama has become the nation's new "Detroit," with three major foreign-owned automotive assembly plants and hundreds of auto suppliers. This cluster has been affected by the economic downturn but less so than the U.S.-based auto industry.

<i>Economic</i>	Job growth has exceeded expectations, having grown 43 percent between 2003 and 2006. Most of the suppliers are existing businesses. There is little entrepreneurial activity within the cluster. There also is no known analysis of the benefits versus costs to the state.
<i>Opportunity</i>	Cluster jobs pay higher-than-average wages for the state and good benefits but are non-union. In addition, Lawson State, a two-year HBCU, is offering training to African Americans to help them land higher-skill jobs.
<i>Environmental</i>	The Daimler Benz vehicles are large and, given fuel costs, demand for them may be reduced. There is little information about the cluster's impact on the environment other than the documented effects of fuel consumed.

50. Marine Trades in the Water Counties of Eastern North Carolina

Description

The cluster includes boat building and other maritime-related companies. Water counties are home to 20 percent of marine trades firms—and 40 percent of employment in the marine trades industry—in North Carolina. The types of boats-building firms range from “small custom-built shops to large mass-production facilities.” The product line is equally as diverse; patrons can shop for yachts, sports boats, fiberglass boats, fishing boats, or wooden boats. Owners prize these boats for their functionality and showpiece quality, while professional sportsmen buy them to compete in million-dollar national fishing tournaments.

Origin

Craftsmen have been building recreational boats in these counties for over 100 years. In Carteret County, sport-fishing boats evolved from the sharpie, a flat-bottom boat design imported from Long Island Sound in the 1870s.

Location

The cluster is located among the Water Counties (Carteret, Pamlico, Onslow, Jones, and Craven) located along the middle of the eastern coast of North Carolina.

Associational infrastructure

Firms exhibit a high level of interdependence and have a symbiotic relationship with local community

colleges and the North Carolina Marine Training and Education Center (NC MARTEC), but they lack the social fabric that promotes interaction among workers and employers are weak.

Development

Companies are linked through a strong value chain. The cluster’s location is one factor for its success. It is halfway between the big markets of the North and the big markets of the South. It’s just more cost-effective in handling the distribution of the boats. North Carolina offers competitive incentives, low taxes, and waterfront land zoned commercial or for manufacturing and building.

Interventions/support

Various centers, community colleges, and agencies support the cluster. NC MARTEC is a comprehensive marine technology training facility operated by Carteret Community College in Morehead City, N.C. for local workers in marine manufacturing and service industries. It is the cornerstone of the local industry. The Small Business and Technology Development Center’s Boating Industry Services is a statewide, special market development service supporting business and employment growth for the state’s marinas, boatyards, boat dealers, boat builders, marine construction firms, and product/service providers.

	Regional Gov.	National Gov.	Public Education	Foundations	Other
<i>Networking</i>					
<i>Training</i>			X		X
<i>Services/Entrepren.</i>	X				
<i>R&D/T</i>			X		
<i>Marketing</i>					
<i>Capital</i>	X				

Community engagement

The North Carolina Maritime Museum in Beaufort aims to preserve the states' maritime history. The museum also offers introductory boat building classes to the public.

Outcomes

Waterfront development is undermining the cluster's growth as well as "industry efforts promoting boating lifestyles." Boatyards are closing or converting to other uses, even as local city officials struggle to maintain public access to parking/docking stations. New residential development yields higher property tax revenues than commercial uses, so there is a strong push to rezone waterfront areas from commercial to residential. For boat builders, calculating the amount of volatile organic compounds released or gauging the degree of regulatory compliance can be extremely complicated. Air-quality regulation is divided up into regions, and some regions are more familiar with boat building than others. Water quality regulations affect mostly boatyards and boat repair.

<i>Economic</i>	"Firms cannot find the workers they need." "Firms refuse to invest in general training for workers." Generally, average wages are higher than the state average.
<i>Opportunity</i>	The increase in the cost of boat-related needs may push boaters with lower incomes out of the market and make boat activities accessible only to those with very high incomes.
<i>Environmental</i>	Firms are having difficulties with apparently conflicting environmental regulations. Additionally, the continuing loss of water-dependent land uses is changing the character of the region.

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