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Employment Generation Strategies For Small Towns: An Overview of Alternatives

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EMPLOYMENT GENERATION STRATEGIES FOR SMALL TOWNS: AN OVERVIEW OF ALTERNATIVES

I. Introduction

Employment growth is a primary economic development goal of most small communities. More jobs generally mean more residents, more spending at local businesses, and more tax revenues for local governments. Thus job growth permits the expansion and improvement of public goods and services, leading to an improved local quality of life and enhanced prospects for future employment growth. In addition, a vibrant job market provides an incentive for local students to continue their education since the rewards for such are evident in better local employment opportunities. And an expanding job market encourages local workers to upgrade their skills in order to qualify for available higher wage jobs. Sustained job growth stimulates improvements in the education and skills of the local labor force, making the community a more attractive location for businesses in the future.

Community leaders generally are well aware of the immediate and long term benefits resulting from employment growth. As such, most communities or counties have economic development authorities with the responsibility of stimulating or attracting new economic activity. Much of the economic development efforts of these local authorities is focused on attracting manufacturing facilities. Yet employment growth, and local economic development, also can result from alternative strategies, such as local business retention and expansion, entrepreneurship and small business development, expansion of nontraditional agricultural activities, development of local service and trade businesses, and attraction of tourism and/or retirement activities.

The purpose of this paper is to summarize the principal advantages and disadvantages associated with alternative employment generation strategies. The discussion of community approaches to more and better jobs is organized as follows. First, two theories of community economic growth are presented as background to the causes and effects of local employment change. Second, six employment generation strategies are introduced along with suggested plans of action for communities interested in implementing a specific strategy. Finally, a procedure is provided for incorporating an employment generation program in the community economic development strategic plan.

II. Theories of Local Economic Growth and Development

To operate successfully in the new global economy, nonmetropolitan communities must appreciate the determinants of regional economic growth and development and the community's role in the process. Two popular explanations of community employment change are the Economic Base Theory and Comparative Advantage Theory. These theories are summarized below.

The Economic Base Theory (Demand Side Approach). Economic base or export base theory focuses on the principal demand-related factors responsible for the growth or decline of a local economy. This theory proposes that economic activity in a region can be divided into Abasic@or Aexport@activities and Anon-basic@or Alocal@activities. The Abasic@activities are firms and individuals serving markets outside the community, and as a result, bringing outside money into the community. Basic activities include farmers and manufacturers that sell to nonlocal markets as well as local tourism activities that attract Aoutside@visitors to town. Retirees that bring outside money to town in the form of pension and social security payments are also Abasic@activities. Alternatively, "non-basic" activities are the trade and service establishments serving markets within the community.

Dividing markets between Abasic@ and Anon-basic@ allows us to better identify the cause and effect relationships in local economic development. Basic industries are the prime movers and stimulators of growth in the local economy. The level of income in the community will increase if outsiders Asend@ or Abring@ new money into the community through their purchase of export goods. On the other hand, Aon-basic@ activities are simply the consequences of the community's overall development, e.g., changes in trade and service income resulting from changes in the level of income in the region. The purchase of a local good by a local individual will not increase community income since money has just traded hands within the community.

The means by which exports lead to increases in community income and employment are summarized in Figure 1. Spending is injected into the local economy by outsiders as they purchase goods and services from the export sector (A). To produce these goods and services, the export sector must hire labor from households (B) and purchase inputs from local suppliers (C) and outside the economy (D). The process does not stop here because the households and non-basic sectors will initiate additional rounds of spending (E, F) with the income they received from the exporters. Note, however, that each round of spending involves less and less money because with each additional round some money leaks out of the economy. These leakages take the form of non-local taxes, savings not reinvested locally, and imports of goods and services from outside the community. Thus, for every dollar generated by exports, part remains in the local economy creating additional employment and part leaks out.

An interesting facet of the economic base theory is that each dollar of basic income generates more than one dollar of total community income. This is referred to by economists as the Amultiplier effect. How large will the total impact be relative to the initial change? The total income and employment generated is directly related to the amount of spending that remains in the local economy for the next round. Each round, some of the income received by households and local businesses is spent on goods and services acquired outside the local economy. The greater these Aleakages, the less spending and income is available for following rounds, and the smaller the multiplier. For nonmetro communities, leakages are significant and the total impact is rarely more than double the initial change.

The economic base model is a popular tool for analyzing local economic development problems and potentials. Declining employment and incomes in a region are generally attributable to a declining export sector, for example, the closing of the local textile mill. Alternatively, to stimulate local growth and development, the economic base theory suggests that efforts should be focused on: (1) increasing export activity, and/or (2) decreasing the proportion of income leaking from the community. Thus, economic bases theory is the justification for development programs such as industrial recruitment, small business development, tourism development, and expansion of the local service sector.

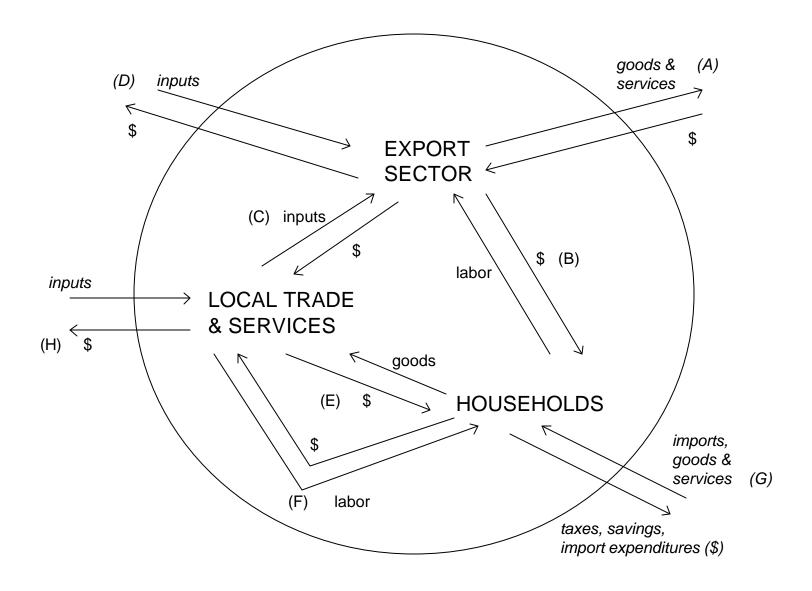


Figure 1. Expenditures Flows In a Community

<u>Local Comparative Advantage (Supply-Side Approach</u>). Economic base theory often is criticized for narrowly focusing on the activities of exporting firms. Curiously missing from this model is any insight as to why exporting firms decided to locate in that community. This question of what the community has to offer that attracts economic activity is the <code>Asupply@side</code> of the economic development process that complements the <code>Ademand@side</code> emphasis of economic base theory.

A supply-driven model makes local economic activity dependent on the availability of resources for the production of goods and services. Accordingly, the starting point in the development process is the availability and quality of labor, capital, markets, transportation facilities, government goods and services, industrial sites, and imported inputs. This theory emphasizes that economic activity in a community will develop according to local comparative advantage, and each community will specialize in the activities which it can produce more efficiently than other regions.

The theory of comparative advantage provides much insight into factors contributing to the decline of many rural communities. Quite simply, communities stagnate or decline because conditions have changed such that these areas are not longer competitive in the provision of goods and services. Mill towns have declined because the best location for textile manufacturing has shifted from the rural South to Mexico and the Far East. Rural service centers have declined because interstate highways whisk potential customers to nearby metro shopping centers. Agriculturally based communities have declined because fewer farmers are needed to feed and clothe the nation.

The economic development implications of the comparative advantage theory are fairly straightforward. Rural communities must improve the quality and/or availability of local inputs if they are to compete successfully for new industry. Three general strategies have been used by small towns to enhance their comparative advantages. First, improvements in public education and the provision of labor training are long-run programs aimed at improving the quality of the local labor force, and as a result, increasing the community's chances in attracting high-skilled, high-wage employers. In addition, improvements in the local quality of life enhance a community=s ability to encourage skilled labor to move to the area to take advantage of employment opportunities. Second, infrastructure investment (sewer and water systems, roads, etc.) is undertaken to insure that local public services are similar to those available in competing areas. Finally, financial incentives programs (loans, tax forgiveness, free land) are provided to overcome the cost difference associated with locating in a small town versus a lower cost urban location. The cost of these educational, infrastructure, and financial incentive programs will vary greatly depending on the characteristics of the community and the competition for the industry.

III. Employment Generation Alternatives

Economic development theories suggest that community efforts should be based on first determining what is the local comparative advantage and then developing new economic activities that take advantage of that competition edge. Within these broad guidelines, six employment generation strategies are popular in nonmetropolitan areas. The potential advantages and disadvantages of each alternative and strategies for community action follow.

 Recruit new basic employers from outside the community, primarily branches of multi-plant manufacturing concerns.

Advantages:

- 1) Branch plants are generally export oriented, thus, the community's economic base is strengthened.
- 2) Rural areas have a competitive advantage for the more standardized production processes undertaken at many branch plants.
- 3) Branch plants often provide a large number of employment opportunities from the outset.

Disadvantages:

- 1) Branches have weak backward linkages to the local economy, and thus, small multiplier effects.
- 2) The locational stability of branch plants is low, that is, they are more likely to relocate than locally-owned plants if economic conditions change.
- 3) Branch plants generally provide relatively few employment opportunities for professional and skilled labor.
- 4) The competition for branch plants is intense, and multi-plant firms often demand extensive incentive packages.
- 5) Manufacturing is declining as a source of employment in the U.S., thus the employment growth potential of this sector is not likely to be large.

Strategies for Community Action

- 1) Develop local industrial sites and public services, and provide specific information on available labor. Once businesses have decided where to locate, they want to set up shop and start operating in a hurry. Well-prepared sites and available facilities speed up this process. But the community has to weigh the cost of these investments against the likelihood of attracting a new industry.
- 2) Develop community and regional facilities to provide transportation, recreation, communication, business services, etc. These services not only attract new employers they also benefit existing businesses and prospective entrepreneurs. Businesses are giving such facilities more weight when selecting a location. Natural resources and market access are becoming relatively unimportant in the location decision. Conditions that make a community a nice place to live are growing in importance.
- 3) Help provide capital resources. Reduced interest rates through revenue bonds and other financial incentives have become widespread. Large firms often look for this type of community assistance as a way of reducing the cost of constructing a new facility. However, giveaways or temporary tax reductions seldom play a significant role in plant location decisions.
- 4) Consider targeted searches for firms that might be most interested in developing a local branch operation. Industry targeting helps identify businesses that the community would have the greatest chance of recruiting and that have the most favorable impacts on the community. Admittedly, such searches are longshots. Nonetheless, the process of becoming well-prepared to seek out prospective employers may also help businesses already in the community.
- 5) Form organizations such as industrial development corporations. It is important that local government be involved in these efforts, but the flexibility of nongovernmental organizations is often useful. For instance, an industrial development corporation may move faster than a local government in taking options on land, or building streets in an industrial park. Communities must be careful to avoid giving something to attract a firm that they would not be willing to give existing businesses.

B. Support Entrepreneurial Activity and the Development of New Small Businesses

Advantages:

- 1) Small businesses are responsible for much of the nation's recent job growth and product innovation.
- 2) Locally owned firms purchase many of their inputs from other local businesses, thus increasing multiplier effects
- Locally owned firms have more stable employment over the business cycle than branches of multi plant operations.
- 4) Locally owned firms provide greater opportunities for managerial and professional employment.

Disadvantages:

- 1) Small independent firms have relatively low survival rates during the early years of their existence.
- 2) Small businesses score low in many measures of job quality: stability, full-time status, wages, pension plans, and health insurance coverage.
- 3) Small business employment growth in rural areas has been disappointing. The rate of employment expansion in nonmetro counties is about one-half the metro rate.

Strategies for Community Action

- 1) Form investor networks to assist new firms with equity and debt capital needs. In the beginning, entrepreneurs usually rely on their own financial resources, or those of family and friends. But these businesses soon need more capital. Financial institutions are usually willing to provide debt capital to familiar businesses when loans can be collateralized. The problem comes with unfamiliar types of businesses or those usually considered high risk. The availability of a local capital pool for debt or equity investment may provide the critical ingredient for success for such enterprises. These pools can be informal arrangements, such as angel investor networks, or more formal organizations such as community development corporations. It is important that potential entrepreneurs know the resources are available.
- 2) Provide counseling and intensive education for those interested in forming new businesses. First-time entrepreneurs seldom know much about business management, marketing, or business plans. Nor do they know of government regulations that would affect them. A local support structure can be very helpful and encouraging to business start-ups.
- 3) Study the market potential for new retail, wholesale, service and industrial input-providing businesses. This information points out opportunities for new local establishments. General insights can be acquired through analysis techniques such as input-output, location quotients, population/employment ratios, and trade area

capture. More detailed analysis will be required to identify real opportunity in the sections which look promising.

- 4) Be aware that adversity often stimulates entrepreneurship. Plant closings or lay-offs get people interested in going into business for themselves. Local leaders should be sensitive to this and encourage and support entrepreneurship at these critical times.
- 5) Adopt an encouraging community attitude towards entrepreneurship. Many new businesses fail after a short period of time. Highly successful small business operators often have failed once or twice before finally achieving their goals. Communities should recognize this pattern, and encourage prospective businesses to try again.

C. Increase income and employment in local agribusiness industries by further processing of local production or the development of new agricultural products for the area.

Advantages:

- 1) Rural areas have a comparative advantage in many of these industries since the principal inputs are located nearby.
- 2) New agribusiness firms may stimulate the demand for locally produced goods (backward linkages), and thus

encourage expansion in these supplying industries.

Disadvantages:

- 1) Little is known about many of these businesses, therefore, they should be considered high-risk ventures.
- 2) Increasing local agriculture processing may be a Abeggar thy neighbor@policy. Increased production or processing in community A may simply lead to a decrease in activity in community B.
- 3) Employment opportunities in some alternative agricultural activities (e.g. catfish processing) may be characterized by low-pay and poor working conditions.
- 4) Many alternative agriculture activities will face competitive markets with high risks of rivalry and retaliation by competitors.

Strategies for Community Action

Programs to aid new agribusiness firms will be similar to those provided for small business start-ups. However, because of the innovative nature of some agribusiness industries (e.g., aquaculture and wine grapes), financing may be difficult to acquire. A local capital pool for debt or equity investment will be more critical to these agribusiness ventures than to the more traditional new business start-up.

D. Expand local service and trade activity to reduce leakages of spending outside the community.

Advantages:

- 1) Service industries provide greater employment stability than manufacturing during fluctuations in the business cycle.
- 2) Employment in the service-producing industries is growing more rapidly than that in manufacturing for the nation as a whole, thus the likelihood of success is higher in trade and services than in the more stagnant sectors
- 3) Services and trade industries generally create few demands on community services (such as water and sewage systems) and minimal environmental impacts.
- 4) An increase in local service employment would increase the local multiplier by decreasing imports (import substitution).

Disadvantages:

- 1) Business and producer services (the most rapidly growing members of this industry) have been reluctant to locate in rural areas.
- 2) Employment in the nonmetro service sector is low wage relative to jobs in the traditional manufacturing sectors.
- 3) Rural communities have had little success in attracting or developing the high wage export-oriented service industries (e.g., warehousing, transportation, research and development, legal and business services).
- 4) Attempts to increase retail and service spending within the community may be a Abeggar thy neighbor@ policy. That is, an increase in sales in community A may result in a decrease in sales in neighboring community B. For the region, no net increase in economic activity has occurred.

Strategies for Community Action

- 1) Survey consumer needs and buying habits to identify the market potential of retail and service outlets. Once opportunities are identified, individuals or firms can be encouraged to do more specific market and financial feasibility analysis. Communities can also provide support mechanisms that help firms conduct difficult business analyses.
- 2) Analyze and renew downtown shopping districts. Sophisticated, costly plans are seldom implemented without early and active merchant and local government participation in the entire process. State and national historic preservation programs often can provide assistance.

- 3) Help employers develop training programs to improve the quality of service. Friendly and efficient service is the cornerstone of all successful businesses.
- 4) Generate more purchases by nonlocal people (tourists and citizens of neighboring communities) through appropriate promotion and advertising. Every place is unique in some way, whether it's because of natural resources, historic events, ethnic heritage, or simply creative imagination. Such uniqueness is exploitable, but it takes an organized effort by a number of people.
- 5) Develop informational programs that encourage local citizens and businesses to buy locally. Most important, those who have something to sell needed to use contemporary purchasing and marketing techniques. Advertising, merchandising and buying systems that served well five or ten years ago may now be out of date. The competition often is not next door or in the next town, but in a large shopping mall or discount store in a city miles away. Community leaders can help organize educational programs and joint promotional efforts
- Bring retailing centers alive by combining effective product and service promotion with recreational activities. In days gone by people went downtown to buy goods and to meet their friends. The city park, courthouse square and bandshell are symbols of the era. Large shopping malls and more recently large city centers have rediscovered the rewards of combining entertainment and sales.
- E. Develop tourism, recreation, and retirement industries to the extent that significant outside spending is attracted to the community.

Advantages:

- Tourism, recreation, and retirement sectors bring outside dollars to the community thus they serve as basic industries to the local economy.
- 2) Tourism is a clean industry with relatively few demands on public services and, if properly controlled, little impact on the environment.
- 3) Development of tourism and recreation facilities also may benefit local residents.
- 4) Tourism facilities are often significant users of local inputs.

<u>Disadvantages</u>:

- 1) Jobs in the tourism sector are generally seasonal and low wage.
- The tourism/retirement industry is highly competitive, thus, the product must be of high quality and competitively priced.
- 3) The tourist attractions must be carefully managed to prevent overuse and degradation.
- 4) A large influx of "outsiders" may create social stress between long-term residents and visitors/retirees.
- 5) This alternative is not practical for communities with few natural amenities.

Strategies for Community Action

- 1) The planning of the tourism product must be community oriented. The tourist experience is greatly dependent on local hospitality, thus it is mandatory that the desires and customs of residents are considered.
- Rural communities can institute programs or regulations that will protect or enhance the attractiveness of tourism and recreation areas. Zoning and sign ordinances, the purchase of scenic easements and buffer zones, landscaping, and preservation of historic buildings are means to augment the visual quality of the area. Of special importance are entrance routes to the community, major travel corridors, and areas proximate to tourist attractions.
- 3) Local government should assume responsibility for promotional activities and materials if the community offers numerous tourist attractions. Under-investment in these efforts will occur if financing is left to individual businesses since firms perceive much of the benefits going to others. Funding for promotions may be generated by taxes on tourist-related spending such as local sales or occupancy taxes.
- 4) Government ownership or subsidization of tourist related activities (golf courses, historical sites, festivals, etc.) may be a good use of public funds if the availability of these activities generates or prolongs tourists=visits. Tourist spending at restaurants, hotels, and gift shops can be increased by inducing longer visits through low cost (subsidized) attractions. Again, funding for these subsidies may be generated by taxes on tourist-related expenditures. However, the tax should not give the impression of

- "gouging" the tourist.
- 5) Communities interested in attracting retirees must provide for the special needs and problems of the elderly. Sophisticated health care services, public transportation, social and recreational opportunities, and low rates of crimes are desirable community characteristics for the elderly.
- F. Develop programs which will aid in the retention and expansion of existing businesses.

Advantages:

- 1) Improving the efficiency of existing firms will enhance the area-s comparative advantage.
- 2) Assisting local firms should have greater short-run employment benefits for the community than recruiting outside firms or fostering new start-ups through entrepreneurial development.

Disadvantages:

Local retention and expansion programs will benefit primarily those industries that are healthy or marginal. Firms whose profits can be increased greatly by relocating are unlikely to be convinced to remain in the community because of the availability of these programs.

Strategies for Community Action

- 1) Organize educational programs to strengthen the management capacities of existing firms. Management is the factor most closely linked with business success or failure. Providing high quality management education at a low cost may be one of the most effective things a community can do to assure economic development.
- 2) Start a business and industry visitation program in which community leaders visit business executives on a regular basis in order to uncover limitations to growth. It may be possible to reduce these limitations through some form of local public or collective private action. All businesses, not just manufacturing, should be included.
- 3) Encourage business growth by identifying sources for debt and equity capital. Small businesses are especially sensitive to capital availability. If local financial institutions are aggressive participants in local economic development efforts, deserving businesses can usually find adequate debt capital. Equity capital may be less readily available. Organized informal and formal capital pools are great stimulants to economic expansion.
- 4) Sponsor educational programs in science and technology to keep businesses aware of the latest technology in their field. Local universities and technical schools usually will cooperate in such efforts.
- 5) Improve the quality of the local work force by providing vocational and technical education, employment counseling, and supportive social services. For example, parents who are preoccupied with the general well-being of their preschool children are seldom as productive at work; good day-care may be the answer.
- 6) Provide information technology services (e.g., the internet) that compete in quality and price with those of other communities. This can improve business efficiency and open access to nonlocal markets.
- 7) Sponsor business and industry appreciation events. These do little per se to improve operating efficiency, but they can encourage business leaders to stay in the community and to expand. At a minimum they make management feel more a part of the community, adding a positive to the intangibles of business location.

The above discussion illustrates that numerous employment generation alternatives are available to nonmetro communities. It is important to reiterate, however, that none of the above alternatives is without shortcomings and no panacea exists for small town growth and development. Each community must assess its'

strengths and weaknesses and then focus on the development programs with the greatest likelihood of success and the desired consequences for the area.

IV. Where Do We Go From Here?

The previous discussion has provided an introduction to the economic development process, a review of the principal employment generation alternatives available, and macroeconomic and international forces impeding

rural development efforts. This information may leave the impression that small town economic development will be a slow, arduous, and frustrating process. This is often the case, as indicated by the fact that only limited success has been made in many smaller communities.. This information also should indicate that any local development efforts must be well-planned and executed if the community is to receive the maximum benefit from its limited development resources. A well-planned development strategy will include the following components.

- 1) <u>Identify Community Leaders</u>: Nonmetro economic development rarely occurs in areas where it is not actively pursued. The competition among small towns is intense and those communities with active and focused leadership will have a distinct advantage.
- 2) <u>Community Analysis</u>: An accurate assessment of the community's internal factors (strengths, weaknesses, and comparative advantages) and external factors (opportunities and threats) is essential for developing a viable strategy. This analysis should be conducted by nonresidents in order to acquire an outside perspective.
- 3) <u>Establish Missions and Goals</u>: At this stage the community must identify specifically what it desires to accomplish (increase school test scores to specific level, decrease unemployment rate to the state average, or increase tourist traffic to a predetermined number).
- 4) Identify Strategies to Achieve Goals: Now the specific program for addressing each goal is selected. The resource needs for conducting the programming, the individuals responsible, and the anticipated timing must be specified.
- 5) <u>Selecting Among Strategies</u>: Invariably, the community's resources are insufficient to undertake all the goals and programs identified. At this stage (after program costs are estimated) the community is ready to establish priorities. A criterion used by economists for selecting among alternative programs is cost-benefit analysis. Note, at this juncture the community should identify the Awinners@and Alosers@associated with the programs. Compensating the Alosers@may reduce the likelihood of internal resistance to the program.
- 6) <u>Program Implementation</u>: During this phase, the program should be evaluated and the distribution of benefits and costs should be recorded. Some of the program costs and benefits will occur only after many years, thus, evaluations should not focus on short-run impacts.

If a new community development strategy is desired, the community may need to start the process all over again. Conditions in the local and national economy probably have changed, new leaders have evolved and new competitive advantages have developed. A return to the beginning of the development strategy is advisable.

Endnotes

1. To economists, economic growth and economic development are related but distinct phenomena. "Economic growth" is a quantitative measure of changes in the size of the local economy. Growth is generally represented by changes in population, employment, production of goods and services, housing stock, etc. Alternatively, "economic development" is a qualitative measure of variations in the local quality of life. Variables used to reflect these changes include poverty and infant mortality rates, level of education, mean family income, and quality of the housing stock. All the above variables are closely correlated with local per capita income, thus, changes in per capita income are often used as a representative measure of local development.

References

- Barkley, David L. (editor). <u>Economic Adaptation: Alternatives for Nonmetropolitan</u>
 Areas. Boulder, Colorado: Westview Press, 1993.
- Beaulieu, L. J. and D. Freshwater (editors). ASouthern Rural Labor Markets.@ Southern Rural Sociology. Volumes 15 (1999) and 16 (2000).
- Center for Study of Rural America. <u>Beyond Agriculture: New Policies for Rural America</u>. Kansas City, Missouri: Federal Reserve Bank of Kansas City, 2000.
- Federal Reserve Bank of Kansas City. <u>Economic Forces Shaping the Rural Heartland</u>. Kansas City, Missouri, 1996.
- Pulver, G. <u>Community Economic Development Strategies.</u> G3366, University of Wisconsin-Extension, Madison, Wisconsin.
- Schaeffer, P. and S. Loveridge (editors). <u>Case Studies in Small Town and Rural</u> <u>Economic Development</u>. Westport, Connecticut: Praeger Press, 2000.
- Shaffer, R. <u>Community Economics: Economic Structure and Change in Small Communities.</u> Ames, Iowa: Iowa State University Press, 1989.

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