

Economic Development of the Rural South: The Promise of Information Technology

John K. Burton* and Barbara B. Lockee**
Virginia Polytechnic Institute and State University
Virginia, U.S.A.

Abstract

The rural South is poorer and less well educated than the United States taken as a whole and in comparison to other rural American areas. Historically, efforts to overcome this problem have focused on economic development by attracting industries looking for cheap labor, land, and taxes. This has resulted in a rural South that relies on low-wage, high-labor industries to provide employment-industries that are logical candidates for relocation to foreign labor markets.

Another phenomenon that contributes to failing rural development efforts is the “brain drain” problem, the trend of well-educated young people leaving the rural South for urban areas. The educational deficits of those left behind in terms of literacy rates, high school graduation rates, etc. is shocking and for many indicators, twice the rate of the remainder of the rural United States.

A possible solution for the provision of economic development opportunities for rural Southern communities lies in the power of information technologies. This paper examines the dilemma of workforce depletion in geographically remote areas and describes the capabilities of networked business and training environments to address the challenge of rural community development in the Information Age.

Keywords: Economic development, Rural community development, Brain drain, Telecommunications, Telecommuting, Telework.

Introduction

Rural Economic Conditions

Rural America, particularly the rural South, has been misunderstood, drained of critical human resources, and largely excluded from America’s prosperity. One of the biggest misunderstandings is the notion of rural America as an agricultural region. In fact, as of 1991, of the 25 million households classified as rural, only 1.6 million of these were actually farming households. An estimated 93% of rural American households are not employed in farming

(Lindsey, 1995) and moreover, most rural Americans do not even live on farms. The trend has been for rural populations to increase as farm households have plummeted. While the number of people living on farms has decreased by 20 million persons over the last century, rural populations, like the national population, have increased by a factor of four (Meyer, 1993). America's farmers have moved to small towns. For most of those who remain in farming, the majority of their income comes from employment off the farm.

At the beginning of the 1990's 23% of all rural counties reported high levels of poverty compared to 4% of metropolitan counties. This rural poverty is "less event specific" (like death or illness of the primary earner) and "more related to long established factors such as limited employment opportunities in the local economy" (Beale, 1993).

Rural America has been described as an "economic backwater" where

The opportunities found there are simply not on a par with those found in large urban areas. The generally stagnant quality to most work in rural areas is apparent whether talking about the Rio Grande Valley or rural Georgian counties (Falk & Lyson, 1989, p. xiii).

What then, do people in rural areas, particularly rural Southern areas, do to earn a living?

As the South developed in the 1960's and 70's, the answer to the question of employment (and development) was manufacturing jobs; particularly low-wage, labor-intensive jobs such as textiles, wood products, leather goods, shoes, etc. which comprised 40% of the rural employment in 1983 compared to 19% for the U.S. as a whole (U.S. Bureau of Economic Analysis, 1985 as cited in Brown & Deavers, 1989). These industries put the rural South in the forefront of the national trend: Exposure to the larger world economy. Rural jobs were to a large extent dependent upon export sales (Lindsey, 1995). As these low-wage, labor-intensive jobs were moved abroad over the last two decades, the rural South suffered disproportionately. Worse, the rate of this loss of such blue collar jobs to foreign competition appears to be accelerating (Barfield & Beaulieu, 1999; Brown & Deavers, 1989) and recent trade agreements can be expected to accelerate the loss of such jobs even more. The loss of these jobs, combined with the well documented financial stress from foreign trade and large agribusiness on the remaining small family farms which do exist in rural areas (Brown & Deavers), results in the outward migration of the best and brightest: A "brain drain."

Brain Drain

The notion of a brain drain first surfaced among economists at the University of Chicago during the early 1960's, particularly by Harry G. Johnson (1965) and it was grounded in the earlier work of Thomas (1958). The concept is relatively simple: Certain factors cause the most capable individuals to migrate from certain geographic areas towards others. The largest of these brain drains occurred from Western Europe towards the United States in several waves beginning in the late 1930's with the largest wave occurring in the mid 1960s when the United States had active, large-scale programs in space and weapons as well as increased funding for basic research in physics, chemistry, and medicine (Adams, 1968).

The exact effects or costs of brain drain are difficult to measure but as Grubel & Scott (1977) put it:

Whenever a country loses a productive inhabitant through emigration the total value of the nation's output, its military and economic powers are reduced. Any person, therefore, who considers these magnitudes to be relevant targets of social and economic policies, judges the emigration of highly skilled and productive persons to be an unmitigated loss (page 27).

It can be argued that brain drain balances out over time; that, for example migration from western Europe to the U.S. was balanced eventually by returning migrations and emigrations from the U.S. to Europe (Grubel & Scott, 1977). Moreover, it has been argued that, at the state level, brain drain effects can be overestimated, but even the most optimistic scenarios concede losses from some states. Richard Raymond, for example, in his 1992 work "The Myth of the Appalachian Brain Drain" shows that many of the economic costs attributed to a brain drain are actually a financial "wash" (although by no means all). He also demonstrates that more than half of the students with the highest SAT scores and the highest college grade point averages stay in West Virginia (the target of his research). He does have to concede however, that more of West Virginia's total college graduates migrate out for increased opportunities than are replaced by immigrating college graduates from other states (Raymond, 1972). Moreover, remaining in the state of West Virginia does not mean that West Virginia graduates return to their home counties – in fact, it is likely that many of those from rural counties who remain in the state will resettle into more urban areas. This intra state brain drain is well documented in North Carolina where research indicates that, when urban areas offer better returns for education, recent graduates migrate to such areas. This within-state migration is particularly acute during local economic downturns (Renkow, 1995a). This notion of receiving better "returns" for educational investment (and achievement) in metropolitan areas perversely implicates the educational system in the brain drain problem: Students which are better prepared by their local schools are more likely to leave rural areas for increased opportunity, particularly when the economy is down. (Interesting, a second way in which the educational system is implicated is in the goal of preparing the best students to go away from home to college. One of the key factors that keep people from leaving their home to migrate to another country, state, or region is the "psychic cost" of relocating to a different culture (Grubel & Scott, 1977). Going away to college often shows many young people that moving to a new culture is far from traumatic, that the psychic cost is not too high. College graduates are too cosmopolitan to be confined to a single geographic area.)

Traditional Solutions

Rural Economic Development

For many rural localities in the United States, the best answer to economic deficits is industrial development, as it has been over the past several decades, although there is good reason to believe manufacturing will not be the type of industry to support rural development in the future (Summers, 1986).

Since the 1930's, Southern states have competed vigorously for industrial development. In her study of one Southern state, Georgia, Colclough (1989) found a success story in terms of industrial growth (Georgia ranked fourth in this regard out of thirteen Southern states between 1969 and 1976) but demonstrated an unevenness in job quality between rural and metropolitan areas. From the Civil War until the 1970's, the South experienced a steady stream of out migration peaking around World War II – particularly among minorities. During the '70's, due to economic development, this trend reversed (Bluestone & Harrison, 1982). Some have argued, (see for example Malizia, 1978), that one of the reasons that the economic disparity between the South and the rest of the U.S. was reduced was the out migration of poor and the in migration of wealthier, better educated immigrants). In urban areas of Georgia, such as Atlanta and Columbus, Colclough found diversified manufacturing industry including metal and metal fabricating, food processing, and the manufacture and fabrication of rubber, plastics, clay, stone, glass and concrete products. In rural counties, she found that manufacturers tended to be focused on single, low-wage industries such as textiles (with mostly a female workforce), paper, and food processing (largely poultry operations). She found several rural counties which had actually deindustrialized, largely as a result of textile closings due to foreign competition (see also, Barfield & Beaulieu, 1999). Overall, Colclough found large inequities between the average wages in the rural versus urban industry, as well as less diverse and less environmentally friendly industries (e.g., poultry processing, “hog bogs”, etc.) in non-metro areas.

Such efforts at industrial development have worked in the past but likely won't in the future (Summers, 1986). In fact, they have never really worked for very long. The industries attracted to rural areas tend to be low-wage (Horan & Tolbert, 1984), slow growth, and one-dimensional. Because they are low wage and labor intensive, they are vulnerable to foreign competition. Because they are slow growth, they tend to require replacement workers only, and because rural industry tends to be less diverse, a down turn in a single industry (such as textiles and shoes) can devastate a local, rural economy (Renkow, 1995a).

The latest efforts at economic development promise little more. A recent study for the Department of Agriculture (Barfield & Beaulieu, 1999) predicts that over the next 25 years, the top 20 new jobs in the rural South will be low-wage: Four of those jobs– waiters/ waitresses, child care workers, cashiers, and food preparation workers - will be under \$15,000 per year and half the new jobs will be under \$20,000 per year (yearly income averages are based on 1997 data). Only three of the top twenty will average more than \$30,000 per year. Worse, three-fourths of the top twenty will likely not be full-time so even these low wage projections are likely high. Moreover, more than half of the top 20 are in areas where the unemployment rates are rated as either “high” or “very high.” Most of the new jobs will require only a short on-the-job training. It is expected that “the occupations which are expected to realize the largest number of job openings in the South are those that require skills that can be captured in less than a single month of on-the-job training” (Barfield & Beaulieu, 1999, p. 12). Relatively new industries to the rural South, once again fiercely sought after and ultimately attracted by rural areas, have been low-wage services such as jobs in large retail (e.g., Walmart), prisons, and “phone banked”-based serves such as telemarketing, debt collection, and customer service.

The Three R's: Residences, Retirement, Recreation

Many of these new jobs will rely on what Lindsey (1995) sees as the backbone of Southern rural economy, the three R's of retirement, residences, and recreation. These three sectors have been a factor in rural economic development and will continue to be important in the foreseeable future. The link between the 3 R's and many of the low-wage jobs expecting growth in the future of the rural South is clear: cashiers, retail salespersons, waiter and waitresses, janitors and cleaners (including housekeeping), nursing aides (including orderlies and attendants), guards, child-care workers, home health aides, receptionists and information clerks, food preparation workers, and teachers' aides (Barfield & Beaulieu, 1999).

In summary, given where the largest numerical gains in jobs are expected to occur, it is evident that many Southerners, by 2005, will be engaged in work that requires little education, pays poorly, involves part-time work, and places the individual at risk of frequent unemployment spells. In fact, most of the "top 20" occupations will not provide job holders with the necessary means to easily support themselves or their family (Barfield & Beaulieu, 1999, p. 13).

Left Behind

The "new" South's metropolitan areas are projected to continue their "boom" (MDC, Inc., 1996). Urban areas are attracting employers who are seeking highly skilled and educated workers (Barfield & Beaulieu, 1999). With its historical reliance on low-skill employment however, the rural South has been badly hurt by declines in goods producing industries (MDC, Inc., 1996).

One critical ingredient for securing a better paying job has historically been education. Here the rural South is severely disadvantaged. According to the SRDC (1999) report, the percentage of rural Southerners, 45-64 years of age, with less than a high school education is twice the level found in the rural United States at large (27.6% versus 12.6%). Nearly one in six young adults 25-34 years of age in the non-metro South possesses less than a high school education. Lack of a high school degree is particularly acute among minorities in the rural South. Fifty-eight and four tenths percent of Hispanics and 41.5% of African Americans in the rural South do not have a high school degree (Barfield & Beaulieu, 1999).

Information Age Solutions

The Virginia Economic Bridge¹

The Virginia Economic Bridge (VEB) is an example of non-profit moving from the past notions of rural economic development to the present day. Begun in the late 1980's as a non-profit venture, the VEB has as its mission the promotion of "the economic vitality and external competitiveness of the Commonwealth through business, industry, and educational partnerships between Southwest Virginia, Northern Virginia and other areas of the Commonwealth" (Virginia Economic Bridge, 2000). Initially focused on connecting the diverse industry, educated labor force, and capital of northern Virginia to the rural Southwestern portion the state, the VEB began by selling the cheap labor, land, and taxes of Southwest Virginia coupled with its relatively good

transportation infrastructure in terms of interstates and railroads. VEB sold these virtues through organizing informational tours of Southwest Virginia for senior business executives from Northern Virginia, as well as tours by Southwest Virginia economic developers to Northern Virginia. This strategy also involved facilitating Southwest Virginia business participation in Northern Virginia tradeshows. Additionally, the VEB established trade linkages to the Peoples Republic of China specifically targeted at the Southwest Virginia coal industry. Several trade missions of Chinese coal executives were hosted but it is not clear whether this effort was fruitful. These more traditional efforts resulted in a one-time contract from Mobile Corporation to purchase \$3.2 million in uniforms from Lebanon Apparel and the location of AT & T's Virginia Relay Center in Norton, Virginia. This facility employs about 175 people. (Additionally the VEB assisted Dewberry & Davis, a large architectural, engineering, and planning firm based in Northern Virginia, in opening a branch in Roanoke, Virginia. Although Roanoke is part of Southwest Virginia, it does not qualify as non-metro or rural.)

During this phase of economic development thinking, the VEB sought to address inequities between the educational systems in Northern Virginia and those in Southwest Virginia by "connecting" the two. Thus, the Thomas Jefferson High School for Science and Technology in Fairfax was "partnered" for certain activities with several Southwest Virginia schools.

The second stage of VEB's efforts involved attempts to sell Southwest Virginia's goods through the development and distribution of the Virginia Procurement Pipeline. This disk-based program eventually became a relational database accessed through the internet for items marketed from the entire Commonwealth of Virginia. The system apparently hit its peak in 1995 when it accumulated some \$500,000 in sales. It was subsequently "spun off" on the advice of a review team which felt that actually running such a system diverged from the core mission of the VEB.

During this stage, intervention into the disparity between schools in Northern Virginia and those in Southwest Virginia was addressed by providing additional monies to the Southwest system. A single grant of \$17,000 was given to Grundy High School in Buchanan County, Virginia for computer hardware and software. (At the time of this writing, Northern Virginia has a shortfall of tens of thousands of people with technology skills and has actively encouraged Southwest and Southside Virginia counties to educate their youth (as well as orient their adult education) to meet that need. In essence, the counties are encouraged to upgrade the skills of their workforce for "export" to the Washington, DC metropolitan area.)

In a third stage of promoting economic development in Southwest Virginia, the VEB began to provide small seed monies (\$10,000 - \$15,000) to six Southwest Virginia "start up" business. Begun in 1999, this project is still in place, and, although the monies were small and the businesses largely low-wage (e.g., at home health care company), the efforts do represent a clear attempt to use out-of-region capital to begin new businesses without "strings" from out-of-region partners. It also has potential to help diversify the rural economy of Southwest Virginia through local entrepreneurs grounded in the local community.

The most promising efforts are currently in place and represent a new way of thinking about rural economic development. First, the VEB has partnered with Walcoff, Inc. to develop a "workport" model of telecommunicating. This approach is clearly a departure from the notion of

development based on a low-wage, low skill workforce. In this model, local workers are trained to telecommute to Northern Virginia. Additionally, it does not involve training and/or educating the best and brightest of the area's young people to take positions in a metropolitan area.

Second, the VEB has facilitated the planning and, hopefully, the development of the Western Virginia Public Education Consortium. This organization promotes a regional decision making approach which considers local needs and culture. Not yet in operation, the consortium will look to promote cooperation across district borders and to seek monies for regional projects.

Community development

While the exodus of young professionals to metropolitan areas is prompted by the necessity of employment and career development, the desire to inhabit more remote areas remains strong. Urban lifestyles with congested traffic, higher taxes, and rising crime rates offer a less than appealing environment for living, especially for citizens who originate from rural regions. While the depletion of jobs in rural areas and the migration of educated professionals to urban centers may present a grim economic and social environment for non-metro communities, solutions to these trends are possible through strategic and innovative community development efforts. Wilkinson (1989) states that "community development requires that at least a minimum threshold be attained in the ability of a local population to meet its daily needs within a local territory (p. 249). On the other hand, Kaufman (1970) warns that rural development that does not start with jobs and income does not start, but rural development that stops with jobs and income stops.

Efforts to facilitate new jobs in rural areas must do so in a way that is environmentally unobtrusive and socially ethical. Traditional rural development activities focused on the establishment of businesses that built local dependencies on production that was inevitably affected by cheaper labor in other countries. The major loss of low-skilled industrial positions, combined with the absence of jobs for more highly-trained, better-educated individuals, has left a void in rural communities. Fortunately, however, a source of local capacity-building and new opportunities for rural development can be found in the power of Information Age technologies.

Telecommunications

While using advanced telecommunications to address long-entrenched economic and social issues in remote regions may seem rather dichotomous, the concept has been explored for more than a decade. The first attempts at technology-mediated work programs originated in Scandinavia in the mid-1980's through the establishment of "telecottages" that offered educational experiences for local residents, as well as access to telecommuting employment opportunities. Programs in Western Australia, England, and Finland successfully experimented with similar telecenters that provided geographically removed areas with access to networked computing equipment and training programs so that local citizens could acquire new skills and explore a variety of alternative career possibilities (Crellin, 1994; Huws, 1997).

Telecommunications technologies are revolutionizing the way that Americans work (Wolff, 1998). Lindsey (1995) states that the impact of telecommunications on rural communities will offer positive, powerful, and long-reaching opportunities. West Virginia serves as a primary

example of the benefits of investing in telecommunications technologies. Their state-of-the-art networking infrastructure has allowed major corporations to move “back office” operations to non-metropolitan regions, dissolving geographic barriers through the provision of employment opportunities across a variety of skill levels (Casto, 1992).

Possibilities through Technology

While the previous example relied on access to a high-speed, high-bandwidth network, such investments are no longer necessary to implement distributed work environments. The recent proliferation of the Internet has made connectivity a standard component of everyday life in America (and globally). Although data communications can occur at reasonable speeds over existing phone lines, technologies are rapidly advancing to offer higher speed connections that allow for faster data transfer directly to the home. Congressman Rick Boucher (2000) detailed the broadband network services soon to be available through direct broadcast satellite (DBS) companies and stated that DBS “will truly become an economic and quality of life bridge for rural Americans” (p. 1). Access to such network services affords a variety of alternatives to traditional employment situations, not to mention the opportunities it presents to geographically rural and minimally populated regions. The following sections detail the range of job and career innovations that networked communications allow.

Localized Centers

The least distributed solution toward facilitating employment opportunities in rural areas is the establishment of local “technology centers”, much like the international examples presented earlier in the paper. Such centers could be based on a variety of sponsoring agencies. One approach would be the creation of a “branch” office of a singular corporate entity. For example, a northern Virginia information technology firm could easily lease inexpensive office space in rural Southwest Virginia, and hire local citizens to telecommute from their own community as a co-located group. Additionally, a technology center could be founded by a local town or region. County or state governments could appropriate funding at fairly minimal costs to provide equipment, connectivity, and coordinating personnel for such an endeavor. Another possibility would be a combined public-private partnership that would establish a community technology center with computer access and job preparation for “telework” from such a location or from an individual’s home. The aforementioned Virginia Economic Bridge program is currently pilot testing such a concept with its Southwest Virginia “workport”. Local workforce development is targeted through the provision of a regionally-based technology center where groups of workers telecommute to contracted technology companies in Northern Virginia. Training to prepare local citizens to engage in networked employment is available through a partnership with Walcoff, Inc., a Northern Virginia-based human resource development firm that specializes in the creation of distributed work environments. It would seem that this combined effort of public and private investments would offer the most advantages for both groups of participants—rural communities gain employment opportunities for local citizens while metropolitan companies acquire a dedicated workforce at a lesser expense than expansion in urban areas.

Individual Telework

Individualized telecommuting is representative of the most distributed type of employment environment. Telework is possible from literally anywhere one has access to a computer, a modem, and a telephone line (real or virtual, through wireless communications). Not only can this form of work accommodate a never-ending array of job types and skill requirements, telecommuting has demonstrated advantages in terms of increased productivity -- over 16% greater than office-based employees (Hequet, 1994, Piskurich, 1996). Apgar (1998) also describes the tremendous cost reductions that companies incur when allowing employees to telecommute. Larger companies, such as AT&T and IBM, have saved hundreds of millions of dollars in location-based employment expenses through the implementation of telecommuting programs.

Telecommuting has the potential to address the previously described rural "brain drain" problem. Virtual internships would allow college students (undergraduate or graduate) to work from rural communities while gaining valuable work experience with employers of unlimited type or location. Such arrangements would allow prospective employers to evaluate the performance of a potential hire while acquiring skilled assistance at a reduced expense. For example, the Instructional Technology Program at Virginia Tech has established a symbiotic relationship with the state's community college campuses on the Eastern Shore of the commonwealth. The colleges seek the expertise of this particular set of graduate students to assist their faculty with the development of distance education courses. The students seek experience in working with real clients to manage authentic instructional development projects. The interns can communicate real-time with their faculty contacts across the state by using low-cost solutions like Internet-based video conferencing, and also asynchronously through email or threaded discussions organized by topic. This cooperative endeavor not only provides much-needed training for the students, but also opens the door for future employment opportunities with internship organization.

Telecommuting also has the power to create job opportunities for individuals who have lost employment to international competition. Through re-training efforts, this group of potential employees can undertake a broad range of tasks and services. Piskurich (1996) contends that telecommuting can be conducted in almost any imaginable area. Potential jobs that could be performed with lesser amounts of training and education would be sales (telemarketing), catalogue order acquisition, data entry, customer service, etc. The key to success in developing a rural workforce to engage in alternative work environments such as telecommuting is a well-designed training effort (Apgar, 1998), either conducted by the employing organization or commissioned by the local community or region. Huws (1997) describes telework as an integral approach to rural job development in Finland. Such international programs could serve as models for American community development efforts.

Sales and Marketing of Local Goods

Telecommunications can also be an advantage to rural citizens who are self-employed in the production of artistic products that are representative of local culture. For example, Appalachian-area hand-made quilts have begun to reach new markets through Web-based advertising and

purchasing. Instead of relying on business from occasional travelers or craft shows, quilters can display their products and take orders completely on-line (Renkow, 1995b). The creation of WWW promotional tools can be relatively simple and inexpensive, and the popularity of shopping on the Internet can be easily leveraged, regardless of geographic location of the goods producer.

Necessity for Transition

The technological aspects of creating and implementing distributed work environments are likely the least challenging part of such an approach to employment and community development. Truly the greatest barrier to the adoption of innovative telecommuting strategies are long-standing cultural norms in rural communities and in the American workplace.

Historically, education has not been valued in rural southern communities because economic development efforts have been targeted toward industries that did not need educated employees, but instead needed workers with specific job-related skills (coal mining, textiles, etc.). This lack of endorsement for education has led to high rates of illiteracy in these regions. While Information Age employees will need job-related training, they will also need to be literate in order to attract businesses to engage in distributed employment arrangements. A possible solution to reversing the illiteracy rate is to begin with one success story, a prototype distributed work program employing a small group of residents in a given community. When other community members see literacy and education being valued by prospective employers, the incentive will be present for cultural change. This proposal is not a silver bullet, as entrenched values are difficult to shift. However, change occurs out of need, and prospective employers could certainly demonstrate the need for literate employees.

In order for telework to succeed in rural areas, several factors must coincide. First, not everyone is well-suited to work in largely unsupervised situations. The successful telecommuter has the following necessary traits: must be self-motivated, committed, organized, a good planner, work well without direction, flexible, and have strong communication skills (Piskurich, 1996). Individuals must assess whether or not they would be suitable candidates for engaging in employment through telecommunications.

Once such a decision has been made, then the next requirement is training, as mentioned previously. Workforce development may range from very context specific, i.e., how to be a good distributed worker, to a complete job skills overhaul, especially for workers who have lost positions that were low-wage and labor-intensive. To contend that those with limited skill sets and little to no experience with information technologies would succeed as teleworkers may sound like a grandiose assumption. However, previously cited international programs offer strong proof-of-concept. For example, in Finland, a program has provided computing and communications skills specifically for farmers' wives to encourage within-family diversification of skills. Because agriculture has suffered the same fate in other countries as it has in the U.S., this re-training opportunity has helped to subsidize rural households that have long depended on farming for income.

Finally, if rural workers are to contract with employers to work at a distance, then it is the company's obligation to provide not only training to the prospective employee, but a supportive climate in which to undertake such a radical change in the way that work is conducted (Apgar, 1998; Huws, 1997). A high degree of organizational change may mean training for influential groups, such as the organization's policy makers, top level administrators, and, at the very least, the managers of telecommuters (Apgar, 1998; Hequet, 1994; Piskurich, 1996). While a strong support system is mentioned as the last necessary component of distributed work environments, it is arguably the most important factor to ensure the success of innovations in rural community development through the use of Information Age communications technologies.

References

- Adams, W. (1968). *The Brain Drain*. New York: MacMillan.
- Apgar, M. (1998). The alternative workplace: Changing where and how people work. *Harvard Business Review*, 76 (3), 121-136.
- Barfield, M. A. & Beaulieu, L. J. (1999). *The changing nature of work in the South: The polarization of tomorrow's workforce*. Report to Economic Research Service (USDA) on behalf of the Southern Rural Development Center (SRDC) at Mississippi State, MS.
- Beale, C. (1993). Poverty is persistent in some rural areas. *Agricultural Outlook*. Sept. p. 22.
- Bluestone, B. & Harrison, B. (1982). *The Deindustrialization of America: Plant Closings, Community Abandonment, and the Dismantling of Basic Industry*. New York: Basic Books.
- Brown, D. L. & Deavers, K. L. (1989). The change in context of rural economic policy in the United States. In W. Falk & T. Lyson (Eds.), *Research in Rural Sociology and Development: Vol. 4*, (pp. 255-275). Greenwich, CT: JAI Press.
- Boucher, R. (2000). Satellite services provide telecommunications bridge for rural America. Available: <http://www.house.gov/boucher/docs/ricksat.htm>.
- Colclough, G. (1989). Industrialization, labor markets and income inequality among Georgia counties: 1970-1980 In W. Falk & T. Lyson (Eds.), *Research in Rural Sociology and Development: Vol. 4*, (pp. 207-222). Greenwich, CT: JAI Press.
- Casto, J. (1992). When telecommunications levels the playing field, West Virginia's a big winner. *Appalachia—Journal of the Appalachian Regional Commission*, 25(2), 11-15.
- Crellin, I. (1994). *The Australian telecentre program: A new approach to technology transfer and rural community development*. Paper presented at the International Conference of Agricultural Economists, Harare, Zimbabwe. (ERIC Document Reproduction Service No. ED 420 755).

- Falk, W. W. & Lyson, T. A. (1989). Introduction: Perspectives on rural labor markets. In W. Falk & T. Lyson (Eds.) *Research in Rural Sociology and Development: Rural Labor Markets: Vol. 4*, (pp. ix-xiv). Greenwich, CT: JAI Press, Inc.
- Grubel, H. G. & Scott, A. (1977). *The Brain Drain: Determinants, Measurement and Welfare Effects*. Ontario, Canada: Wilfred Laurier University Press.
- Hequet, M. (1994). How telecommuting transforms work. *Training*, 3 (11)56-61.
- Horan, P. M. & Tolbert, C. M. (1984). *The organization of work in rural and urban labor markets*. Boulder: Westview Press.
- Howes, C. & Markasen, A. R. (1981). Poverty: A regional political economic perspective. In A. H. Hawley and S. M. Mazie (eds.), *Nonmetropolitan American in Transition* (p. 437-463). Chapel Hill: University of North Carolina Press.
- Huws, U. (1997). *Teleworking: Guidelines for good practice*. IES Report Number 329. (ERIC Document Reproduction Service No. ED 404 568).
- Johnson, G. H. (1965). The economics of the brain drain: The Canadian case. *Minerva*, 3 (306).
- Kaufman, H. F. (1970). Team leadership: A key to development. Mississippi State, Mississippi: Mississippi State University, Social Science Research Center, Applied Series I.
- Lindsey, L. B. (1995). The future in rural America. Speech presented to the annual meeting of the Renaissance of Rural America in Memphis, TN.
- Malizia, E., (1978). Organizing to overcome uneven development: The case of the U.S. South. *The Review of Radical Political Economics*, 10, (p. 87-94).
- MDC, Inc. (1996). *The State of the South*. Chapel Hill: MDC, Inc.
- Meyer, L. V. (1993). Agricultural change and rural America. *The Annals of the American Academy of Political and Social Science*.
- Piskurich, G. (1996). Making telecommunications work. *Training and Development*, 50 (2), 20-27.
- Raymond, R. (1972). The Myth of the Appalachian Brain Drain. Morgantown, West Virginia: West Virginia University Foundation.
- Renkow, M. (1995a). *Rural versus urban growth: Why do rural counties lag behind?* Report for Cooperative Extension Services at North Carolina State University. Available: <http://www.ces.ncsu.edu/resources/economics/crdnews/>
- Renkow, M. (1995b). *Economic trends affecting small and home-based businesses*. Cooperative Extension Service Report # CD-45, North Carolina State University. Available: <http://www.ces.ncsu.edu/resources/economics/cd45/>

Summers, G. F. (1986). Rural community development. *Annual Review of Sociology*, 12, 341-371.

Thomas, B. (1958). *Economics of International Migration*. London: MacMillan.

Wilkinson, K. (1989). Community development and industrial policy. In. W. W. Falk & T. A. Lyson (Eds.), *Research in rural sociology and development: Vol. 4* (pp. 241-253). Greenwich, CT: JAI Press.

Wolff, M. (1998). The networked economy and society. Speech presented at Rural Europe: New technologies and changes in rural employment. Available: <http://www.rural-europe.aeidl.be/rural-en/agenda/itpoints/wolff.htm>.

Virginia Economic Bridge. (2000). Available: <http://www.virginiaeconomicbridge.org/>.

* Dr. John K. Burton is a Professor of Instructional Technology at the Virginia Polytechnic Institute and State University. He can be reached at the Department of Teaching and Learning, Virginia Tech, 220 War Memorial Hall, Blacksburg, VA 24061-0313, USA. Email: jbarton@vt.edu, Phone: (540) 231-5587, Fax: (540)231-9075.

** Dr. Barbara B. Lockee is an Assistant Professor of Instructional Technology at the Virginia Polytechnic Institute and State University. She can be reached at the Department of Teaching and Learning, Virginia Tech, 220 War Memorial Hall, Blacksburg, VA 24061-0313, USA. Email: lockeebb@vt.edu, Phone: (540) 231-5587, Fax: (540)231-9075.

¹ All discussions of the Virginia Economic Bridge are based on promotional material of the VEB itself either in print and/or on the VEB website.

