

Rural Infrastructure as a Cause and Consequence of Rural Economic Development and Quality of Life

*Proceedings of a Regional Workshop
Birmingham, Alabama
February 1997*

Edited by
Joe Schmidt
Mississippi State University

Sponsored by

Southern Extension/Research Activities-Information Exchange Group-16 (SERA-IEG-16)
Southern Rural Development Center

SOUTHERN REGION INFORMATION EXCHANGE GROUP-16

PARTICIPANTS

State	Name, Institution
Alabama	Ntam Baharanyi, Tuskegee
Arkansas	Don Voth, University of Arkansas Wayne Miller, University of Arkansas
Kentucky	David Debertin, University of Kentucky
Louisiana	David Hughes, Louisiana State University
Mississippi	Joe Schmidt, Mississippi State University Kim Steil, Mississippi State University Lynn Reinschmidt, Mississippi State University
Missouri	Tom Johnson, University of Missouri
North Carolina	Ron Wimberley, North Carolina State University
Oklahoma	Gerald Doeksen, Oklahoma State University Mike Woods, Oklahoma State University
South Carolina	Mark Henry, Clemson University
Texas	Greg Taylor, Texas A&M University
USDA	Randy Williams, CSREES
Southern Rural Development Center	John Lee Bonnie Teater Jacque Tisdale
Advisor	Bo Beaulieu, University of Florida

Foreword

Declining rural communities, fewer jobs, limited access to information and services and out-migration of youth have forced rural America to rethink its future. Future sustainability of rural communities depends in significant measure on their capacity to deploy financial, physical and intellectual assets efficiently and effectively. Communities need to plan for modernization of infrastructure that enhances future development opportunities.

The 1997 session of the Southern Extension/Research Activities Information Exchange Group-16 (SERA-IEG-16) focused on theory, research and educational models pertaining to community sustainability. Educational and research models were presented defining sustainability along with overviews of selected efforts to foster community viability. Papers and ideas discussed at this meeting provided insight into the concept of community sustainability. A model used in Virginia was presented that assists community decision-makers evaluate fiscal impacts of changes in the local economy. Preliminary results and observations of a multi-state Communities in Economic Transition pilot were presented along with a national overview of this National Initiative.

Information and discussion at this session contributed tremendously to participants understanding of sustainable community issues and models. Publication of these proceedings provides an opportunity to share this information with others.

The committee appreciates the support of the Southern Rural Development Center in publishing these proceedings.

Also included in this proceedings is a review of telecommunications technology and business location presented at the January 1995 meeting in New Orleans.

Joe Schmidt
Mississippi State University

TABLE OF CONTENTS

Foreword	i
Communities in Economic Transition: A Pilot Effort in Oklahoma Mike D. Woods	1
Defining Sustainable Communities Donald E. Voth and Zola K. Moon	25
Defining Sustainable Communities: Discussion of a paper by Donald E. Voth and Zola K. Moon David L. Debertin	81
An Introduction to the Community Policy Analysis System, COMPAS Thomas G. Johnson, James K. Scott and Jian Ma	89
Comments on: “An Introduction to Community Policy Analysis System, COMPAS” Mark S. Henry	99
Telecommunications Technology and Business Location: A Review Edward J. Malecki	107
Telecommunications Technology and Business Location: A Review David Mulkey	143

COMMUNITIES IN ECONOMIC TRANSITION: A PILOT EFFORT IN OKLAHOMA

Mike D. Woods
Professor and Extension Economist
Department of Agricultural Economics
Oklahoma State University

Communities in Economic Transition (CET) is a national initiative of the Cooperative Extension System. CET identifies ways communities can initiate action to improve the local economy. Possible actions could address the areas of home-based/micro-enterprise development, retail development, small manufacturing, tourism, value-added agriculture, or youth entrepreneurship. Extension Service staff can help communities make those all-important decisions--the critical why's, what's, who's, when's, and how's of creating sustainable economic development. Extension's knowledge of strategic planning, coupled with expertise in guiding community leaders through the maze of decisions, is available to assist with a critical first step for communities or regions.

Oklahoma is involved in a pilot effort to implement the CET initiative. Six states are involved in the pilot: Oklahoma, New Mexico, Colorado, Texas, Utah, and Arizona. Communities from each state were selected to be part of a two to three year effort. Both state and federal resources have been utilized to assist the communities as they consider future options to improve the local economy and quality of life. In Oklahoma, Pushmataha County and Harper County have been chosen to participate. Local development plans have been drafted with goals and objectives identified. Topics such as tourism development, value added agriculture, and local health care are being addressed by the communities. National experts have been utilized in local and regional training programs.

The purpose of this paper is to summarize and share overall experiences of the Oklahoma communities as they have participated in the pilot effort. Specifically, the paper will:

1. Present a brief overview of the CET Initiative and Pilot Project;
2. Describe programming efforts of the Oklahoma participating communities; and
3. Summarize characteristics of the program and lessons learned.

CET INITIATIVE AND PILOT EFFORT

The Extension Service-USDA has adopted a national rural partnership initiative called "Communities in Economic Transition" (CET). The initiative is designed to support community-based planning for economic diversification and local-area entrepreneurship targeted at jobs, income and public revenue enhancement. The CET initiative calls for working partnerships. Citizens from non-metropolitan communities and inter-disciplinary representatives of Cooperative Extension, land-grant universities and other local, state and federal agencies are involved.

Six southern and western states are working together to pilot the initiative--Arizona, Colorado, New Mexico, Oklahoma, Texas and Utah. Extension seed money and human resources from state and national levels have been committed to help begin the pilot project. Resource-sharing will occur within and across state lines. **Extension representatives have established inter-agency/community partnerships with 10 rural communities across the six participating states.** The communities, Extension, and other cooperating agencies are sharing human, material and/or financial resources for the pilot effort.

The challenges of rural economic diversification require consideration of individual jurisdictions along with consideration of wider trade, agricultural, socio-cultural and econological areas and systems. For this reason, a "pilot community" may include several towns in one county, a full county, or several towns in neighboring counties.

The pilot effort offers opportunity:

- To build partnership model(s) which support locally-desired and managed economic diversification, and entrepreneurship which promotes rural-area employment, income, public revenue and quality of life;
- For joint-participation, learning and action by rural citizens, officials, businesses, local, state, regional and national Extension units, private- and public-sector agencies, schools and colleges;
- To document learning and progress, and to share these with communities and agencies, nationwide.

Additional goals are for Extension and other interested agencies to work in concert with pilot community leaders as they:

- Study local circumstance, opportunities and limitations;
- Plan and build local economic diversification and entrepreneurial capacity;
- Access and mobilize internal and external resources for desired development; and,
- Monitor and celebrate local progress.

What Benefits Are Available for Participating Communities?

- Support for community self-study and economic diversification, planning, implementation and progress-monitoring;

- Inter-community workshops and discussion forums, with some travel assistance for local leadership teams;
- Informational materials, work sessions, technical assistance and problem-solving support from expert resource teams with experience in areas such as:
 - Community-Based Business Retention and Expansion
 - Value-Added Processes and Products, Small Manufacturing
 - Rural Home-Based and Micro-Enterprise Development
 - Rural Tourism Development
 - Retail Trade Development
- Sustained attention and networks of contacts available through local, state and national private-and public-sector agencies, organizations, schools, colleges, land-grant institutions.

How Is The Pilot Effort Organized?

The pilot project is an alliance among pilot communities and participating agencies, organizations and schools. It includes an inter-state coordinating team and sounding board, linked to coordinating teams in the states and communities. These are complimented by inter- and in-state expert resource teams. The resource teams may also draw on assistance from subject-matter specialists nation-wide.

Thus far, Extension staff (from the six states and elsewhere) have agreed to volunteer their time in support of the pilot project. The Extension volunteers are professionals with interests in community/economic development, agriculture and natural resources, youth and family education. Some Extension seed money has been utilized to assist with travel support for community and resource teams to attend workshops, for materials acquisition/development and for project monitoring/evaluation support.

Communities, agencies, organizations and schools interested in joining the partnership have been asked to show similar evidence of commitment. They have done so with funds and in-kind contributions of human effort, materials, travel assistance and other resources. Agencies and organizations seeking involvement may do so at local, state, regional and/or national levels. Preference for selection of pilot communities was given to those that demonstrated broad-based participation and commitment from community members, officials and other groups in their economic development efforts. Strong local Extension staff interest and commitment was also a prerequisite for pilot community selection. Figure 1 presents a map of the pilot communities involved in the six-state region. There is broad geographic and demographic representation included in the 10 communities from six states. Appendix I presents descriptive data for the 10 counties/communities involved in the pilot effort. The 10 communities include: Globe, Miami, and San Carlos in Gila County, Arizona; Williams in Coconino County, Arizona; Dove Creek in Dolores County, Colorado; Portales in Roosevelt County, New Mexico; Torrance County, New Mexico;

Figure 1. CET Commnities

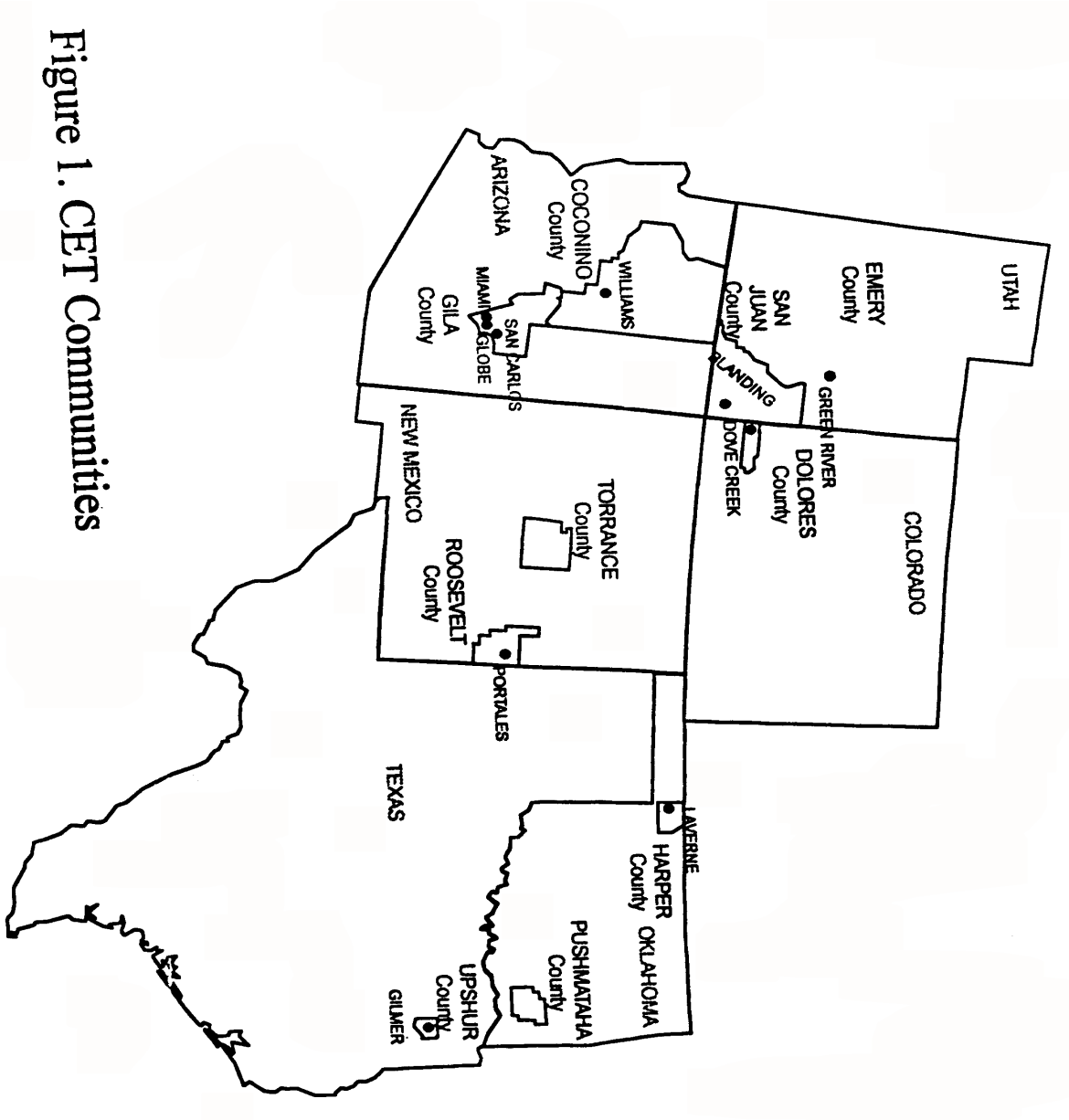


Figure 1. CET Communities

Laverne in Harper County, Oklahoma; Pushmataha County, Oklahoma; Gilmer in Upsher County, Texas; Blanding in San Juan County, Utah; and Green River in Emery County, Utah.

The CET Pilot Program formally “kicked-off” in April 1995 with a three day workshop in Farmington, New Mexico. Each of the 10 pilot communities sent a team of about 10 local leaders to the workshop to receive training in economic/community development and begin to discuss possible goals and objectives. The following year (early 1996) two or three local leaders from each community attended a similar meeting in Tuscon, Arizona. A third meeting was held in Dallas in the Fall of 1996. Between these meetings, the local communities worked with extension staff and other resource persons to plan and implement local goals. Training, and technical assistance were provided as needed by individual communities.

OKLAHOMA PROGRAMMING EFFORTS

There has been a great deal of training and technical assistance directed toward the two pilot CET communities in Oklahoma. Local leaders/volunteers in the two communities have been extremely active in their efforts and they have been aggressive in utilizing available assistance/resources. The efforts of the Oklahoma communities and their accomplishments will be presented through the use of CET Team Reports which were presented at a meeting held in Dallas in November 1996. These reports were prepared by local leaders who attended the Dallas meeting. The team reports summarize much of what has gone on in Oklahoma:

Laverne-Harper County Report

Prepared by Merle Swineford, Barbara Swineford, Leroy Waugh(1)

In February we met with the other communities in Harper County and voted to expand our CET program to all of Harper County. We changed the name of our group to the Harper County Area Rural Development Coalition.

During the past few months we have spent most of our time on two major projects. The first was a health survey which we completed. The second project was working very hard to bring in Murphy Family Farms to our area. We know that sooner or later the hog industry would be looking at Harper County so we choose to go after what our research showed was the best hog producers in the nation. We are excited about their decision to move here, and are doing all we can to make them feel welcome. There have been many negative comments about other hog producing companies that are in the panhandle, however, we feel that we have a company that cares about the community in which it is located, and cares about the environment. The company asked for no incentives and we had none to offer other than showing them our desire to have them locate in our community. We think this will be a good partnership.

We are on the internet and although there have been frustrations with the telephone equipment, things are getting better and we think it is an excellent tool for economic development. With our CET grant, we are able to pay the monthly fee to access the internet. Several of our business people have looked up items on the internet relating to their businesses. Our school will soon be going on line. We believe the internet program that was presented through OSU and Chuck Willoughby helped all those who attended, and now we have many people in the community on the internet.

We have met many of the goals we had strived to reach, but as you all know, in economic development, there is no end, just continuation.

We have worked with the following agencies in our efforts to bring new industry to Harper County: Oklahoma Dept. of Agriculture, Oklahoma Dept. of Commerce, Oklahoma Extension Service, and Rural Economic and Community Development.

We appreciate the effort put forth by our facilitators. Without their help, we would not be as far along in our economic program as we are. Our appreciation goes out to everyone in the CET program. Its been a long hard road, but we are pleased that we were able to drive the distance.”

**The goals of the Harper County Area Rural Development Coalition
and accomplishments since the Tuscon meeting were:**

**GOAL 1. DEVELOP INFRASTRUCTURE NEEDED TO MAINTAIN AND IMPROVE
QUALITY OF LIFE.**

A 750 gal. per minute water well was drilled and is now on line.

All county firemen are working on mapping and marking county roads so they will be easily identifiable during an emergency.

Dispatchers have received new radios and a tower is being built to accommodate the new transmission.

All city hydrants have been numbered and tagged.

We are on the internet. Many businesses have taken advantage of what the internet has to offer.

GOAL 2. PROMOTE JOB CREATION AND INCOME ENHANCEMENT FOR THE COUNTY.

The Fast Trac program was developed. Fourteen students started the program but only four graduated.

Our biggest success has been the relationship with Murphy Family Farms. On February 14th, 25 citizens from this county went to Nevada, Missouri to visit the Murphy Family Farms operation. Ten other persons went from Oklahoma State University, the Oklahoma Department of Agriculture, and the Oklahoma Department of Commerce. We were well received and asked many questions about their operations. Representatives from Murphy Family Farms came to Laverne and were warmly welcomed. They asked for no incentives, choosing instead to become citizens of this community in all that it entails. Currently they are working on an 18 million dollar investment in the Harper/Ellis County area. They project that in three years they will have over 300 employees working in their hog facilities. Our local farmers will be able to apply to build nurseries for the baby pigs. We expect that we may have 30 of these in three years. The impact on our community will be enormous. This will be an agricultural business that is not totally dependent on the weather.

Two buildings on our main street will be renovated for a drugstore. Panhandle Telephone Company will be opening an office in Laverne the first of the year.

Another building has been donated by a well known family's estate to the Chamber of Commerce. This will place our Chamber of Commerce office on Main Street and should be a big asset to the community.

GOAL 3. PROMOTE A POSITIVE ATTITUDE AND OUTLOOK FOR HARPER COUNTY

We have expanded our CET program to include the entire county. We are beginning to feel a more positive outlook for our county. Both the citizens of Laverne and Buffalo are finally beginning to see what we are trying to accomplish. I wish we could say that we have many more people involved in this project, however, those who are involved are dedicated and we appreciate their efforts.

GOAL 4. ENSURE QUALITY COMMUNITY HEALTH CARE

Our community wide health care survey was completed with a grant from Phillips Petroleum Foundation and Oklahoma Family Community Leadership.

Woodward Hospital has an office in Laverne that is staffed by a nurse practitioner five days a week.

There is also a committee that is working to get a Board and Care Home utilizing the former hospital building.

GOAL 5. ENSURE QUALITY SCHOOLS

We lost 12 teachers in our school system this year because of a change in the state's funding ratio. We are hoping that the influx of students that will come with the Murphy Family farms help us gain back some of the teachers that we lost.

The OSU ORIGINS Internet program was presented at the school. We had 14 community and school personal that participated. The telephone lines are in the process of being laid and the school hopes to be on line shortly. The library is in the process of putting all their inventory on computer and once they get on the internet they will be able to participate in the inter library loan program across the state. The computers in the teacher's lounge will also have access to the internet.

Pushmataha County Report

Prepared by Larry Stone, Karen Stone, Laverda Johnson(2)

The goals of the Pushmataha County CET team upon leaving Farmington two years ago were:

GOAL 1. ACQUIRE A PAID ECONOMIC DEVELOPER WITH AN OFFICE, COMPUTER, TELEPHONE AND SUPPORT STAFF

This was accomplished on July 1, 1995 with the hiring of Mike Boling through an agreement with Little Dixie Community Action Agency in which they provided office space, secretary service, telephone and PDI was to obtain matching local and county support. We are continuing to seek funding to fund an economic developer in helping get a sales tax passed that is earmarked for economic development. This is three and one half percent of a one cent county wide sales tax.

GOAL 2. CONTINUE WORKING AT UNIFYING THE COUNTY

This was going to be accomplished by rotating the meetings between the north and south ends of the county and send news releases to all papers in the county. This has been done very successfully. Also in the by-laws, the Board of Directors of our organization asked that each County Commissioner be on the board or name a designee and also that each incorporated town name a member to the board. This has continued to help unify the county.

During a recent election of officers, officers were elected from throughout the county.

GOAL 3. DEVELOP A BOUND COUNTY STRATEGIC PLAN

This was accomplished and made available to all members in July, 1995. This has not been reprinted in 1996, however, the committees have met and revised their goals as needed. This will continue as an ongoing process. Plans are to reprint a revised plan when time permits.

Long Term goals when we returned from Farmington were:

GOAL 1. CREATION AND RETENTION OF JOBS

This was going to be accomplished by reactivating the Industrial Trust Authority. This has been done with new members and directors.

We wanted to develop a strategic tourism plan. The tourism committee developed a plan, after studying the situation they realized that some of their goals were not realistic. A tourism survey has been developed and will be conducted soon. A "Community Swap with Gilmer, Texas has been completed and Mike Hedges from Arkansas Cooperative Extension Service is coming in December to further guide us in establishing more attainable goals. When these have been completed, a new strategic tourism plan will be developed.

The economic developer has been working with current retail and manufacturing businesses to expand. He has also been working with new small retail and manufacturing businesses by helping them develop business plans, find locations and helping them to find funding.

A community profile brochure was developed and printed by a PSO grant. This is sent to prospective businesses and industries.

Plans were to hold a Fast Trac training following the Farmington Conference. Upon discussing this with the coalition, we decided to hold Fast Trac II. It was held beginning in the Fall of 1995. Eleven participants graduating with a completed business plan.

The local Home Based Business Association has continued to provide educational programs for small entrepreneurs on a monthly basis. One CET team member has assumed this responsibility.

GOAL 2. COMPLETE CAPITAL IMPROVEMENT PLANS

The cities of Antlers and Clayton have completed Capital Improvement Plans with the Department of Commerce Grants.

A County Rural Solid Waste Plan has been developed, submitted to and approved by the Department of Commerce.

To develop better communications was another objective under this goal. The phone company installed digital switches in Pushmataha County in April, 1996 which has helped communications and allowed us to access internet even though we still have high long distance charges. The county extension office is now connected to internet, has ORIGINS and an E-mail address.

GOAL 3. IMPROVE MARKETING AND PUBLICITY OF THE COUNTY

Plans were to place entry signs coming into the county. This project has been looked at several times and we are still looking for some funding sources for this project. Some material and labor has been pledged, but is needed to complete the project.

We had plans to hold a photography contest and use the photos in a tourism brochure. This has been referred to a committee. The committee are developing guide lines to be used in the contest.

A tourism map has been developed and is at PSO being printed on a grant from them. We planned to build pride in the county with the Oklahoma PRIDE program. We have trained the CET team as PRIDE trainers but have not provided the training for businesses in the county. We will be offering PRIDE training to business leaders/owners at a later date.

Pushmataha County Economic Developers Report, October 1996

Prepared by Mike Boling(3) First Years Accomplishments

Approximately 37,000 sq. ft. of new construction has been completed or is planned and will be completed within the near future. The total investment in construction will exceed \$700,000.00.

Over 13,000 sq. ft. of existing space has been leased out.

A total of 50+ new jobs have been created or will be created upon completion of the planned construction.

The existing industrial tract has been filled. The city has acquired an additional 138 acres to be the next industrial site.

A quality nine hole golf course has been completed and is ready for play.

Land has been acquired through donation for the nine apartments to built at Moyers. All obstacles have finally been overcome and construction is under way.

The 13,500 sq. ft. Big Ben building and 13.5 acres of land was donated to Little Dixie to be used for economic development.

The train which would "NEVER AGAIN STOP IN ANTLERS" is now stopping on a regular basis.

Worked with the city council to get them to delete the requirement for a certified engineer when constructing a new building.

A pilot project of "FAST TRAC" was completed in Antlers with nine successful graduates.

Marketing brochures have completed by PSO and are available for distribution.

The total investment in economic development July 1, 1995 through October 31, 1996 has been \$56,755.01 with Little Dixie paying \$49,137.03 and PDI paying \$7,617.98.

The Physical Therapy lab at the hospital is waiting on the engineer and should go out for bids in the near future.

In addition we have a new newspaper, a new furniture store, a new laundry, and a new bakery located in Antlers.

A new sub division and a new trailer park is also under construction just south of Antlers.

The accomplishments and successes of the two Oklahoma pilot communities are due to many individuals, organizations and programs. The CET Program did play a key role and local leaders give the program a great deal of credit. Other resources and programs were identified after the CET effort began and the additional resources have helped a great deal. Ultimately, the CET Program is evaluated by the opinions, feedback, and satisfaction demonstrated by local residents the program is designed to assist.

PROJECT CHARACTERISTICS AND LESSONS LEARNED

Follow-up activities have included training and technical assistance as identified by the communities. Joint projects have been identified which cut across state lines. Technology such as the internet is being utilized to link the communities and provide additional assistance.

Key elements of this approach include:

- * focus on job creation strategies,
- * building action teams in targeted communities,

- * partnership across state lines,
- * accessing resources within/outside Land Grant systems,
- * systems approach to economic development,
- * emphasis on interagency cooperation and linkages,
- * long-term commitment to targeted communities,
- * ability to monitor and measure impact, and
- * further expansion to other communities using lessons learned as a research base.

The CET Program is somewhat unique among strategic planning programs in that the main focus is job creation and economic diversification. Value added, tourism, home-based or micro businesses, small manufacturing, and retail trade are all job creation strategies addressed as a part of the initiative. The program includes a long-term commitment to targeted communities which increases the probability of some sort of impact.

Partnerships across state lines have been utilized-both in terms of service providers and in terms of communities supporting one another. Resources both within and outside the Land Grant system have been utilized with an emphasis on cooperation. Currently, new communities and new multi-state partnerships are being formed based on the CET model.

A recent study of programs providing assistance to communities in strategic planning and visioning analyzed various programs around the country. The study found several preconditions for a successful program (Woods). These preconditions were part of the CET effort and are useful to note:

1. Local Commitment: the local community must be willing and able to commit time and resources to the effort;
2. Broad Community Involvement: all segments of the community (income, race, public-private, etc.) should be involved in the effort;
3. Community Ownership: the community should participate in structuring the training or educational efforts;
4. On-Site Visits: service provider should meet on-site at the communities to insure broad community involvement and to better understand local needs;
5. Reliable Survey and Secondary Data: data can help to understand local strengths and weaknesses and often generates new ideas for development;
6. Exposure to New Information: the common perceptions should be challenged and local leaders need to be exposed to new information to face new economic challenges; and
7. Timely Response: teachable moments should be exploited.

Finally, Walzer (1996) notes several common elements of successful programs. The CET Pilot effort again tended to exhibit these elements as the programming evolved: Clear Understanding of the Process; Well-Balanced Coordinating Team; Program Delivery with a Strategic Approach; Solid and Meaningful Action Plan; Continuing Support; Access to Available Resources; and Ongoing Evaluation.

The CET Pilot effort has demonstrated that Extension programs, in cooperation with others, can make a difference. Focusing resources and attention on targeted communities allows adequate time to have an impact, document results, and continue to follow-up with needed resources. In many ways, CET is simply a model of sound Extension work or sound community development assistance. Cooperation and sharing of resources across state lines have made the program somewhat unique.

ENDNOTES

- (1) Merle Swineford and Barbara Swineford are local business leaders from Laverne in Harper County, Oklahoma. Leroy Waugh is the Extension Agriculture Agent in Harper County.
- (2) Larry Stone and Karen Stone and local leaders in Pushmataha County. Laverda Johnson is the Extension Home Economist in Pushmataha County.
- (3) Mike Boling is the paid economic developer for Pushmataha County.

REFERENCES

- Walzer, Norman. "Common Elements of Successful Programs," in Community Strategic Visioning Programs, Edited by Norman Walzer, Praeger: Westport, Connecticut and London, 1996, pp. 183-196.
- Woods, Mike. "Preconditions for Successful Program Implementation," in Community Strategic Visioning Programs, Edited by Norman Walzer, Praeger: Westport, Connecticut and London, 1996, pp. 75-92.

APPENDIX I
CET Pilot County/Community Data

TABLE 1
Population for CET Counties

	1990 Total	1990 Per Sq. Mile	1980 Total	1980 Per Sq. Mile
Arizona:				
Coconino County	95,591	5.2	75,008	4.0
Gila County	40,216	8.4	37,080	7.8
Colorado:				
Dolores County	1,504	1.4	1,658	1.6
New Mexico:				
Roosevelt County	16,702	6.8	15,695	6.4
Torrance County	10,285	3.1	7,491	2.2
Oklahoma:				
Harper County	4,063	3.9	4,715	4.5
Pushmataha County	10,997	7.9	11,773	8.3
Texas:				
Upsher County	31,370	53.4	28,595	48.7
Utah:				
Emery County	10,332	2.3	11,451	2.6
San Juan County	12,621	1.6	12,253	1.6

Source: Bureau of the Census. As compiled by USA Counties, A Statistical Abstract Supplement, U.S. Department of Commerce, June 1992.

TABLE 2
Education Characteristics of CET
Counties

	Percent High School Graduates 1980	Percent College Graduates 1980
Arizona:		
Coconino County	74.4	23.2
Gila County	61.7	7.8
Colorado:		
Dolores County	64.4	7.7
New Mexico:		
Roosevelt County	64.6	16.2
Torrance County	58.4	9.5
Oklahoma:		
Harper County	66.6	11.2
Pushmataha County	49.0	8.3
Texas:		
Upsher County	54.0	10.0
Utah:		
Emery County	75.0	9.8
San Juan County	58.8	14.3

Source: Bureau of the Census. As compiled by USA Counties, A Statistical Abstract Supplement, U.S. Department of Commerce, June 1992.

TABLE 3
Personal Income and Earnings of CET Counties

	1988 Personal Income Per Capita (dollars)
Arizona:	
Coconino County	\$ 11,627
Gila County	\$ 10,403
Colorado:	
Dolores County	\$ 16,365
New Mexico:	
Roosevelt County	\$ 10,631
Torrance County	\$ 9,210
Oklahoma:	
Harper County	\$ 15,306
Pushmataha County	\$ 7,937
Texas:	
Upsher County	\$ 11,434
Utah:	
Emery County	\$ 8,949
San Juan County	\$ 7,931

Source: Bureau of Economic Analysis. As compiled by USA Counties, A Statistical Abstract Supplement, U.S. Department of Commerce, June 1992.

TABLE 4
Labor Force of CET Counties

	1989 Civilian Labor Force	Unemployment Rate
Arizona:		
Coconino County	44,204	6.7
Gila County	12,616	9.2
Colorado:		
Dolores County	1,034	4.2
New Mexico:		
Roosevelt County	7,717	4.4
Torrance County	3,705	8.7
Oklahoma:		
Harper County	2,404	3.3
Pushmataha County	4,884	7.0
Texas:		
Upsher County	19,316	7.1
Utah:		
Emery County	3,666	7.6
San Juan County	3,941	7.4

Source: Bureau of Labor Statistics. As compiled by USA Counties, A Statistical Abstract Supplement, U.S. Department of Commerce, June 1992.

TABLE 5
Federal Funds and Grants of CET Counties

	1989 Total Expenditures (Thousands of Dollars)	Per Capita (Dollars-Based on 1988 Population)
Arizona:		
Coconino County	\$257,574	\$2,737
Gila County	\$135,604	\$3,340
Colorado:		
Dolores County	\$12,128	\$8,085
New Mexico:		
Roosevelt County	\$53,597	\$3,268
Torrance County	\$19,789	\$1,959
Oklahoma:		
Harper County	\$13,936	\$3,167
Pushmataha County	\$41,572	\$3,493
Texas:		
Upsher County	\$68,708	\$2,154
Utah:		
Emery County	\$31,189	\$2,760
San Juan County	\$33,400	\$2,879

Source: Bureau of the Census. As compiled by USA Counties, A Statistical Abstract Supplement, U.S. Department of Commerce, June 1992.

TABLE 6
Retail Trade of CET Counties

	1987 Sales of Establishments with Payroll (Thousands of dollars)	1987 Sales Per Capita (Dollars)
Arizona:		
Coconino County	\$590,800	\$6,535
Gila County	\$172,478	\$4,378
Colorado:		
Dolores County	\$3,721	\$2,481
New Mexico:		
Roosevelt County	\$74,638	\$4,524
Torrance County	\$32,736	\$3,274
Oklahoma:		
Harper County	\$10,165	\$2,259
Pushmataha County	\$35,327	\$2,994
Texas:		
Upsher County	\$95,358	\$2,971
Utah:		
Emery County	\$20,309	\$1,751
San Juan County	\$18,956	\$1,648

Source: Bureau of the Census. As compiled by USA Counties, A Statistical Abstract Supplement, U.S. Department of Commerce, June 1992.

TABLE 7
Service Industries Characteristics of CET Counties

	1987 Receipts of Establishments with Payroll (Thousands of Dollars)	1987 Receipts Per Capita (Dollars)
Arizona:		
Coconino County	\$220,368	\$2,438
Gila County	\$39,752	\$1,009
Colorado:		
Dolores County	(D)	(D)
New Mexico:		
Roosevelt County	\$14,325	\$868
Torrance County	\$1,491	\$149
Oklahoma:		
Harper County	\$4,113	\$914
Pushmataha County	\$6,175	\$523
Texas:		
Upsher County	\$8,849	\$276
Utah:		
Emery County	\$11,485	\$990
San Juan County	\$6,789	\$590

¹ (D) Avoid disclosure of confidential information.

Source: Bureau of the Census. As compiled by USA Counties, A Statistical Abstract Supplement, U.S. Department of Commerce, June 1992.

TABLE 8
Economic Data for CET Counties 1988 (Thousands of Dollars)

	Transfer Payments	Dividends Interest, Rent	Earnings in all Industries	Farm Earnings
Arizona:				
Coconino County	\$168,815	\$156,241	\$824,125	\$15,649
Gila County	\$114,128	\$89,089	\$276,757	3,395
Colorado:				
Dolores County	\$4,160	\$3,971	\$16,074	\$6,795
New Mexico:				
Roosevelt County	\$38,739	\$37,053	\$103,608	\$17,940
Torrance County	\$19,208	\$13,128	\$38,057	\$6,354
Oklahoma:				
Harper County	\$11,651	\$18,441	\$39,516	\$13,621
Pushmataha County	\$34,746	\$13,890	\$40,666	\$2,591
Texas:				
Upsher County	\$70,968	\$62,509	\$120,086	\$10,398
Utah:				
Emery County	\$17,622	\$9,694	\$111,934	\$3,865
San Juan County	\$22,960	\$10,223	\$68,711	\$5,101

Source: Bureau of Economic Analysis. As compiled by USA Counties, A Statistical Abstract Supplement, U.S. Department of Commerce, June 1992.

TABLE 9
Population of CET Cities

	1990	1980
Arizona:		
Globe	6,062	6,886
Miami	2,018	2,716
San Carlos	2,918	2,668
Williams	2,532	2,266
Colorado:		
Dove Creek	643	826
New Mexico:		
Portales	10,690	9,940
Moriarty	1,399	1,276
Oklahoma:		
Laverne	1,269	1,563
Antlers	2,524	2,989
Texas:		
Gilmer	4,822	5,167
Utah:		
Blanding	3,162	3,118
Green River ¹	866	1,048

¹ The majority of population of Green River is in Emery County with part of its population in Grand County

Source: 1990 Census of Population and Housing

**APPENDIX II
CET Pilot Project Contacts**

If you would like more information about the Communities in Economic Transition Partnership, please contact any of the following people:

Utah

David Rogers
Inter-State Chairperson, CET
Assistance
Community & Resource Development
216-C Main NW
Utah State University
Logan, UT 84322-0730
801/750-1255

Oklahoma

Mike Woods
Department of Agricultural
Economics
Room 514, Agricultural Hall
Oklahoma State University
Stillwater, OK 74078-6026
405/744-9837

Colorado

Sheila Knopp
Center for Rural CES
138 Aylesworth Hall
Colorado State Univ.
Fort Collins, CO
80523
303/491-6421

Texas

Greg Taylor
Texas Agricultural Ext. Service
Texas A&M University
Dairy Science Building, Room 110
College Station, TX 77843-2124

New Mexico

Bob Coppedge
College of Agriculture
& Home Economics
New Mexico State University
Box 3AE
Las Cruces, NM 88003
505/646-4122

Arizona

Julie Leones
Department of
Economics & Resource
University of Arizona
208 Economics 409/845-4445
Bldg. #23
Tucson, AZ 85721
602/621-6255

Federal

Randy Williams
U.S. Department of Agriculture Extension Service
South Building, Room 3869
14th at Independence SW
Washington, D.C. 20250-0900
202/720-2805

DEFINING SUSTAINABLE COMMUNITIES

Donald E. Voth
Department of Agricultural Economics and Rural Sociology
University of Arkansas

Zola K. Moon
School of Human Environmental Sciences
University of Arkansas

Introduction

We were charged with preparing a paper on “Defining Sustainable Communities.” On the surface this seemed like a manageable, if not an easy, task. In fact, to someone like the senior author, whose professional career has been spent in community development, and in trying to persuade both development practitioners and his own disciplinarian colleagues in both Sociology and Economics that community really means something of significance, it was quite gratifying to be given this assignment.

However, when one considers the variety of meanings and intellectual origins of the concept of sustainability things become very complicated. And when all is said and done, we’re not quite sure that the sustainability movement intends to take community any more seriously than anyone else.

The word, sustainability, plays a very special rhetorical role. It has always been a heavily value-laden term, even in its more limited use in agriculture, simultaneously signifying that someone else had it all wrong, and that we, now, finally have it right. Two unfortunate features are frequently, and I believe very significantly, associated with this use of language. Since the “field” has been defined by the use of a new term, the first is the ability to overlook everything that has ever been done before as wrong or irrelevant. The second is the claim of exclusive ownership of the “turf” by persons and agencies quite unfamiliar with the actual area of work and about which they may actually know very little (in this case community development).

However, it is clear that joining the term “sustainable” to development, to community development, and to agriculture has touched a responsive chord among many, including people in both urban and rural communities all over the world¹. Millions of community people yearn to be given a chance to play a role in defining the future of the communities in which they live, to liberate themselves from dogmas, policies, and conventions which have resulted in a sense of powerlessness, disaffection (Luloff and Swanson, 1994), and domination by economic and political orthodoxies to

¹“Getting people to agree on ways to measure progress is a good way to find our common ground,” said Alan Atkinson, a founder of the Sustainable Seattle effort and consultant to the Upper Valley project. Such projects are part of an international movement. Countries such as Holland, Germany, New Zealand, and Australia use them to help guide national policy, Atkinson said (Doing Democracy, 1966). The capacity to find “common ground” is one of the unique possibilities of a community-based approach (Kemmis, 1990).

which, they are told, they must merely submit themselves (Barber, 1984). They yearn for a form of local community development that speaks a language of possibilities, of hope (Kimmons, 1990), and of redefining progress in terms they define themselves within their own communities. For it is in their own communities where progress, well-being, and social change actually affects people (Rossi, 1972) and where, perchance, they could affect the outcome (Kemmis, 1990).

There are several ways the task of “defining sustainable communities” could be approached. One is to proceed formally, to articulate one--or several--more or less unambiguous meanings for the concept and then proceed to discuss these meanings, either in terms of existing practice and existing literature or by a logical exploration of potential operational measures and empirical manifestations. Then, of course, one might examine what is known about the causes and consequences of “community sustainability,” how it can be predicted, etc.

One would think this discussion would include consideration of some of what used to be regarded as the fundamentals of the sustainability of communities of place, things like the economic base, the need for developing the economic base, and the community's own resources and infrastructure. Allegedly, it was the failure to concern itself with some of these “fundamentals” that caused earlier forays into community development to fail (Holdcroft, 1978; the Ford Foundation, 1973, pp. 6-7).

However, to proceed in this manner confronts us with a simple problem. To admit it is simultaneously embarrassing and, perhaps, heretical. What in the world does--or can--the concept of the “sustainable community” mean? It's not so hard to attach meaning to the idea that some communities contribute more or less to overall environmental sustainability. But, when community per se is the topic, either in the form of societal integration, in the form of the sustainability of groups that make up either interest communities or geographic communities in general, or, more specifically, in the form of the sustainability of specific geographic communities, it simply isn't easy to formulate how the term sustainability applies, or what it is intended to mean.

Indeed, as we see below, even in the sustainability literature itself when the community per se becomes the issue, the term “sustainability” regularly gives way to other terms, like “community capacity,” “community processes,” etc. There are at least two reasons for this difficulty. First, by itself “sustaining” a community seems not to be a very worthy goal, typical Chamber of Commerce rhetoric notwithstanding. It is the qualities of community life which are worth sustaining, not communities per se. More importantly, though, communities themselves are actors. They have, or they should have, “agency,” the capacity to forge their own futures (Bhattacharyya, 1995; Luloff & Swanson, 1994). As such, their futures are largely unpredictable, except within very limited time frames.²

The other approach, and the one we have taken, is to review a wide range of the sustainability literature, especially that which pretends to have at least some focus upon the community, and try

² Cottrell's “Death by Dieselization,” (Cottrell, 1951) is only one of many examples of communities which, because they lost their prior economic base, should have died but didn't, largely by dint of their own determination. This happens frequently enough to make the community developer extremely skeptical of efforts to predict community futures.

to come to an understanding of how it treats the community, and, perchance, what community sustainability actually means to those using the idea. To do this we have exploited a comprehensive literature review by Mark Roseland of Simon Fraser University. Then we provide an overview of a variety of contexts within which the idea of sustainable communities confronts rural and community development. We provide a brief critique of this literature as it relates to the community.

Unfortunately, in our review of the sustainable communities literature we find very little dealing with the community or community development *per se*. Indeed, the very idea of “sustainable communities” turns out to have a very peculiar meaning in this case. For the most part, it refers to what communities contribute to regional, national, and global sustainability, not the sustainability of communities themselves. Also, we find very little attention to topics one would think to be basic to community sustainability, like infrastructure and the community's economic base.

However, the move of the environmental community and the sustainability movement to aggressively implement its adage that one should “think globally and act locally” has many positive features and has captured the popular imagination. This is largely what sustainable communities is really about. Community developers can benefit from forging linkages with the sustainability movement. Infrastructure issues would seem to be among the easiest to integrate. In fact, it seems certain that as communities themselves take on the task of setting sustainability goals, infrastructure issues will rise to the top, although they are not there yet.

Of course, the large group of individuals and organizations promoting the sustainability agenda would benefit from some real exposure to the economic, political, demographic, and socio-cultural sciences of community and to community development itself.

A Characterization of Sustainable Communities Literature

“Sustainability” as a concept defining development, communities, and community development is relatively recent. It owes its emergence as a popular mantra to a growing environmental movement's concern about the directions being taken in economic and social development programs and policies; to specific concern about agriculture, its sustainability, and its environmental impact; and, finally, to advocates of rational and controlled growth of communities. Subsequently, though, it has gained popularity in other related areas, first in agriculture and agricultural research and somewhat later in Community Development itself.

Literature Review and Principles

Mark Roseland of Simon Fraser University provides a review of the sustainable communities literature in work done for the Ontario Round Table on Environment and Economy (1994). The purpose of his report was to “... review the literature on sustainable communities, and show the range of characteristics, processes and initiatives that are used to define and/or describe sustainable communities” (1994, p. 2).

He identified ten different variations in this literature, which fall into four broad categories: designers, practitioners, visionaries, and activists (1994, p. 2). The ten fall into these four categories as per his Table 1 (1994, p. 2).

Table 1

Categories in the Sustainable Communities Literature			
Designers	Practitioners	Visionaries	Activities
The Costs of Sprawl	Sustainable Urban Development	Sustainable Communities	Green Cities
Sustainability by Design	Sustainable Cities	Community Self-Reliance	Ecocities
	Local Sustainability Initiatives		Ecocommunities

The Designers category (“Costs of Sprawl” and “Sustainability by Design”) includes architects, planners, consultants, and related professionals. When discussing “sustainability,” they are concerned primarily with issues such as new subdivisions, not atmospheric change or social equity. Activists are the other end of the spectrum in Roseland’s schema. These are people whose writings center around environmental issues and include those who consider themselves bioregionalists, social ecologists and other types of environmentalists (Roseland, 1994, p. 3).

In between are “ecologically informed and inspired” Practitioners such as politicians, local government, and increasingly, citizens and community organizations. For these people, community is most often defined as municipalities or local governmental units. Visionaries are agriculturists, economists, architects, planning theorists, and appropriate technologists. They most often define community in terms of association (for example, women of color) or of interest (for example, social justice). Their discussions and writings are concerned with topics like energy conservation, appropriate technology and community economic development (Roseland, 1994, p. 3). Table 2 in Appendix 1 compares the orientation, focus, and means of each category in Roseland’s outline.

The Sustainable Communities Resource Package (SCRCP, 1997) presents “model principles” for sustainable communities and gives examples of their potential application in specific communities. The principles are listed below; the principles with examples are presented in its Table 3 found in Appendix 2.

Model Principles for Sustainable Communities

A sustainable community is one which:

1. Recognizes that growth occurs within some limits and is ultimately limited by the carrying capacity of the environment
2. Values cultural diversity
3. Respects other life forms and supports biodiversity
4. Has shared values amongst the members of the community (promoted through sustainability education)
5. Employs ecological decision making manager (or equivalent)
6. Makes decisions and plans for the future in a balanced, open and flexible manner that allows the decisions and plans to be informed by perspectives from the social, health, economic and environmental sectors of the community
7. Makes best use of local efforts and resources (strives for local self-sufficiency and nurtures solutions at the local level)
8. Uses renewable and reliable sources of energy
9. Minimizes harm to the natural environment
10. Fosters activities which use material in continuous cycles
11. Does not compromise the sustainability of other communities (a geographic perspective) (SCRP, 1997, p. 2).

What is clear from this treatment of the idea of sustainable communities is that the term has much more to do with the idea environmental sustainability concepts applied at the regional, national, and global level than it does with community. We shall be returning to this theme from time to time throughout this paper. The community is there as the locus within which actions are to be taken, but the “sustainability” has little to do with the community *per se*.

To illustrate this, and, more importantly, to try to provide an overview of what we perceive to be happening under the rubric of “sustainable communities,” and “sustainable community development,” we now examine six somewhat distinct contexts in which the idea has emerged, contexts with which rural community scholars and rural community development practitioners should try to be familiar.

Selected Contexts of Community Sustainability

This idea of community sustainability confronts the typical community development practitioner in several somewhat distinct, though over-lapping contexts. Those identified and discussed in some detail below are: (1) The President's Commission on Sustainable America; (2) the integration of environmental concerns and sustainability with development; (3) sustainable agriculture; (4) community sustainability assessment as a way to bring the Human Dimensions into Ecosystem Management; (5) Rural Development in the Forest Service, USDA; and (6) planning, community design, and growth management.

The President's Commission on Sustainable America

In June of 1993 President Clinton created the Council on Sustainable Development (See details on the Council in Appendix 3). He asked the Council to “find ways 'to bring people together to meet the needs of the present without jeopardizing the future” (President's Council, 1996, p. 3). The Council's report was issued exactly a year ago in February of 1996. Like the sustainability movement discussed above, the Council's report focuses primarily upon broad, national and even international goals with respect to sustainability. As can be expected of this kind of an initiative from the Clinton Administration, or any administration for that matter, it has already generated political criticism and opposition and is likely to create more in the future. The Farm Bureau has already attacked it (American Farm Bureau Federation , 1996).

The vision statement of the Council's report is:

Our vision is of a life-sustaining Earth. We are committed to the achievement of a dignified, peaceful, and equitable existence. A sustainable United States will have a growing economy that provides equitable opportunities for satisfying livelihoods and a safe, healthy, high quality of life for current and future generations. Our nation will protect its environment, its natural resource base, and the functions and viability of natural systems on which all life depends (President's Council, p. iv).

Chapter 4 focuses upon communities and is entitled “Strengthening Communities.” While including an expected emphasis on environmental, resource use, and physical design issues, it focuses primarily upon what are presumed to be the characteristics of better--more sustainable?--communities. The summary statement for Chapter 4 is:

Creating a better future depends, in part, on the knowledge and involvement of citizens and on a decision-making process that embraces and encourages differing perspectives of those affected by government policy. Steps toward a more sustainable future include developing community-driven strategic planning and collaborative regional planning, improving community and building design; decreasing sprawl; and creating strong, diversified local economies while increasing jobs and other economic opportunities (President's Commission, p. 83).

Most of the discussion, as well as the recommendations concerning strengthening communities deals with the socio-political processes of community life. Typical statements are:

Sustainable communities are cities and towns that prosper because people work together to produce a high quality of life that they want to sustain and consistently improve (p. 85).

Much of what is needed to create more sustainable communities is within reach if people and their community institutions join forces. Many communities are beginning to use sustainable development as a framework for thinking about their

future. The big institutions of society--including federal and state governments, businesses, universities, and national organizations--can and should provide support for local community efforts. And in some cases, these institutions need to review the barriers they sometimes inadvertently have erected that diminish the ability of communities to pursue sustainable development (p. 86).

The Council believes that one of the best ways to strengthen communities is to ensure that people have greater power over and responsibility for the decisions that shape their communities. Time and time again, community leaders told us that a fundamental component of implementing sustainable development locally is having people come together to identify a community's needs and then work toward collaborative solutions. Accomplishing this requires both political leadership and citizen involvement. They also told us that creating mechanisms for communities to work together cooperatively is necessary to deal with problems that cross political jurisdictions (p. 87).

Finally, before making a series of recommendations designed to strengthen communities, they say:

[T]here are fundamental steps to a community-driven strategic planning process. A critical first step is to assemble a broad cross section of the community to participate in an open, public process. Through a series of meetings and events, the community develops a vision for its future. It then conducts an inventory and assessment of its economic, natural, and human resources. Specific economic, environmental, and social goals are determined; these build on the community's vision, resources, and needs. Next, the community sets priorities for its goals, identifies specific actions, and establishes indicators or benchmarks to measure progress toward the goals. If successful, the strategic planning process results in a clear sense of direction and timing. It specifies the actions and responsibilities to be undertaken by business, residents, government, and community groups (p. 88).

The Council presents nine sets of policy recommendations, dealing with community-driven strategic planning; collaborative regional planning, building design and rehabilitation; community design; community growth management; creating strong, diversified local economies; training and lifelong learning; environmental economic development; and redevelopment of brownfield sites.

It seems somewhat remarkable that the Council's results and recommendations have so little to say about community infrastructure. Two sections of Chapter 4 mention infrastructure or infrastructure-related issues: "Designing Sustainable Communities," (pp. 92-100) and "Promoting Economic Development and Jobs" (pp. 101-107). Action 2 of Policy Recommendation 6 in this section states: "State and federal governments should promote labor force development when they fund physical infrastructure projects for transportation, public housing, and sewer and water systems within a community by hiring locally and providing skills training for workers" (p. 103). Under Policy

Recommendation 8, Action 3, they focus upon recycling and waste disposal issues. However, the sustainability of communities' infrastructure itself seems never even to have come to the surface.

Development and the Environment

The writers of Sustainable Seattle's "Indicators of Sustainable Community: 1995" give a brief history of the sustainability movement, as they see it:

During the 1970's and early 1980's, a number of independent scientists, activists, and policy-makers were working on responses to the linked problems concerning issues of environment (the health of nature) and development (the progress of humanity). They began to use the term "sustainability" to describe the goal of integrating concerns and analyses that join economic development and ecological health.

In 1987, the United Nations' "World Commission on Environment and Development" released its report Our Common Future, which brought the terms "sustainability" and "sustainable development" into widespread use. Our Common Future (or the "Bruntland Report," after the Commission's Chair, Norwegian Prime Minister Gro Harlem Bruntland) defined sustainable development as "Development which meets the needs of the present without endangering the ability of future generations to meet their own needs."

This definition is the one used most often throughout the world. Together with the principles the Commission established, it incorporates five key concepts:

1. The needs of the future must not be sacrificed to the demands of the present.
2. Humanity's economic future is linked to the integrity of natural systems.
3. The present world system is not sustainable because it is not meeting the needs of many, especially the poor.
4. Protecting the environment is impossible unless we improve the economic prospects of the Earth's poorest peoples.
5. We must act to preserve as many options as possible for future generations, since they have the right to determine their own needs for themselves.

At the June, 1992 United Nations Conference on Environment and Development, commonly referred to as the "Earth Summit," representatives from nearly every nation on Earth adopted these principles in the form of international treaties and agreements. At the same time, a "Global Forum" of citizens' groups from around the

world developed grass-roots initiatives designed to monitor governments and push sustainability efforts beyond what traditional activities were able to do.

The Sustainable Seattle Indicators Project was in part a local response to these global efforts. It was envisioned as a first step in the process of assessing our progress toward (or away from) long-term sustainability; identifying key steps we can take to improve our progress; and making these changes real (Sustainable Seattle, 1995, pp. 2-3).

Following the adage to “think globally and act locally,” local manifestations of this broad concern about the environmental impacts of development, such as Sustainable Seattle together with a large number of other similar efforts, have focused upon the development of indicators of sustainability. These indicators are typically developed by community people in a participatory fashion and monitored over time also in a participatory fashion. As such, they are reminiscent of the earlier “social indicators” movement. Like the sustainability movement, the social indicators movement focused upon supplementing or even displacing conventional measures of development and progress such as Gross (National) Product or simple numbers of jobs created. Measures were chosen that more accurately represented the quality of life in communities and even the fundamental social and cultural aspects of the communities which made growth and development possible, aspects now frequently referred to as “social capital” (Campbell and Converse, 1972; Rossi, 1972).

For the most part in both the earlier social indicators movement as well as in the sustainability movement, communities were initially incidental to the movement's efforts. In a sense they still are. Communities enter as sites in which social well-being, social change, and/or sustainability are measured, and in which--perhaps--actions are taken to affect them. However, as Rossi's excellent essay on Community Social Indicators displayed (1972), the earlier social indicators movement did retain some links to fundamental issues of community, both in the abstract sense of general social integration and in the more concrete sense of the fundamental nature of interest and geographic communities.

In discussing appropriate indicators, Sustainable Seattle says:

Indicators are bits of information that highlight what is happening in a large system. They are small windows that provide a glimpse of the “big picture.” They tell us which direction a critical aspect of our community, economy, or environment is going: forward or backward, increasing or decreasing, improving or deterioration, or staying the same.

As criteria for indicators, they say:

Not just any piece of data tell you what you need to know about sustainability. Good indicators are:

- Bellwether tests of sustainability.--They reflect something basic and fundamental to the long-term cultural, economic, environmental, or social health of a community over generations.
- Accepted by the community.--They are understood to be a valid sign of sustainability (or symptom of distress).
- Attractive to local media.--The press publicizes them and uses them to monitor and analyze community trends.
- Statistically measurable.--Data exists that is relevant to this geographic area, and preferably comparable to other cities, counties, or communities. If data are not readily available, a practical method of data collection or measurement exists or can be created.
- Logically or scientifically defensible.--Understandable rationales exist for using the specific indicator for drawing general conclusions from it.

Finally, they say that:

It is significant to remember that just as “the map is not the territory,” the indicators are not the same thing as the systems they attempt to measure. These numbers, charts, and graphs represent, in very simple terms, a much more complex reality. Reflected here are the individual lives of millions of people, animals, and other living things; a complicated economic system; and all the conflicts and commonalities that are expressed in community and political life. The indicators, taken together, provide us with a snapshot of our community, but there is no abstract set of data or comprehensive theory that can take the place of people's direct experiences (Sustainable Seattle, 1995, pp. 3-4).

Sustainable Seattle then proceeds to discuss the inter-relationships among indicators and, especially, their application. The indicators themselves include the categories of Environment, Population and Resources, Economy, Youth and Education, and Health and Community.³

Hardi, et al, in a paper prepared for the Government of Manitoba, reviews a number of these “Models and Methods of Measuring Sustainable Development Performance” (1995). Their review includes Alberta's Sustainable Development Indicators, Oregon Benchmarks, Choices for Colorado's future, Sustainable Seattle, and Life in Jacksonville (FL): Quality Indicators for Progress, one of the earliest such efforts. They develop from these a general framework for sustainable development indicators for the province of Manitoba.

They point out that the methodology for measuring sustainability or sustainable development performance is not standardized but rather, “Indicator categories and individual indicators are usually identified and validated through a focused exercise either using a public hearing/public consultation

³ Alan Atkinson, co-founder of Sustainable Seattle, now heads Redefining Progress, a policy institute focused on national economic issues from a sustainability perspective (Sustainable Seattle, 1996).

process or working with representatives of major stakeholders from government, NGO's, the private sector, academia and the general public” (1995, p. 3).

The diversity of local conditions and value systems results in different goals and consequently different specific indicators of sustainable development. As Hardi, et al, explain:

These differences seem to support the concept of sustainable development being a “story line”, requiring contextual interpretation. How can, given this complexity, an initiative learn from the experience and potentially improve the usefulness of other measurement projects that have gone through indicator selection, data collection, and are in the process of incorporating extended indicator sets into decision processes?

There seem to be similarities between projects under different conditions on two accounts. First, although indicator sets are never completely overlapping, there are strong scientific arguments for a category of compulsory biophysical indicators as *minimum* requirements of sustainability. The argument is that approaching sustainability in the social or economic sense is strictly conditional upon a number of critical factors, for instance the maintenance of soil fertility. It is subject to discussion, whether or to what extent should an expert-derived minimum indicator set come under stakeholder scrutiny. Secondly, there are similarities between the way indicator selection procedures are structured (Hardi, 1995, pp. 3-4).

The following are some of the criteria Hardi, et al, used to define successful indicator sets:

- definition of indicator sets through a public participation or public or stakeholder consultation exercise; public participation in the identification of indicator sets can be effectively linked to the task of setting measurable targets;
- provision of indicator profiles that cover both ecological as well as socio-economic dimensions;
- institutionalization of the indicator initiative in terms of effective laws and regulations, assignment of data collection, monitoring and report preparation responsibilities, and regular reporting; and
- integration of indicators into decisions processes (Hardi, 1995, pp. 4-5).

An extensive, highly generalized, sustainability indicators effort is that of private consultant, Maureen Hart, who has put her overall framework with extensive examples of sustainability indicators on the web at <http://www.subjectmatters.com/indicators/>. A portion of Hart's discussion of indicators of sustainability is reproduced in Appendix 4.

She cites, as the most frequently used categories of indicators, the following:

- Economy
- Society
- Environment
- Government,

but points out that the following are also frequently included:

- Education
- Public Safety
- Health
- Recreation
- Housing
- Resource Use
- Quality of Life
- Transportation
- Population.

She then goes on to discuss various options of concrete indicators under each of these categories, and evaluates various alternatives. She finally presents long lists of sample indicators for potential application.

So, what we have here is the environmental movement literally beginning to figure out how to implement its agenda locally. The key strengths seem to be (1) concrete indicator development, (2) the application of participatory processes for the development, implementation and monitoring of these indicators, and (3) the use of alternative, socially meaningful concepts and indicators of well-being. Community, itself, is more the instrument than the object of sustainability, and, in general, the fundamental base to be sustained is the environment and the community's natural resource base rather than, for example, the community's economic base, or its infrastructure base, or even its "social capital."

Sustainable Agriculture

A movement has been mobilized during the last decade in support of sustainable agriculture and the Sustainable Agricultural Research and Education (SARE) program of USDA. This includes the program itself and also several strong regional advocacy groups, the Sustainable Agricultural Working Groups (SAWG's), the Consortium for Sustainable Agriculture, and several others.

In establishing research and extension initiatives related to Sustainable Agriculture in the 1990 Farm Bill, Congress defined sustainable agriculture as “integrated systems of plant and animal production practices having site specific application that will over the long term:

- satisfy human food and fiber needs,
- enhance environmental quality and the natural resource base upon which the agricultural economy depends,
- make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls,
- sustain the economic viability of farm operations, and
- enhance the quality of life for farmers and society as a whole” (QOL Task Force, 1994, p. 1).

USDA's Sustainable Agricultural Research and Education (SARE) program currently defines sustainable agriculture as:

Sustainable agriculture refers to an agricultural production and distribution system that:

- Achieves the integration of natural biological cycles and controls,
- Protects and renews soil fertility and the natural resource base,
- Optimizes the management and use of on-farm resources,
- Reduces the use of nonrenewable resources and purchased production inputs,
- Provides an adequate and dependable farm income,
- Promotes opportunity in family farming and farm communities, and
- Minimizes adverse impacts on health, safety, wildlife, water quality, and the environment (USDA, 1996).

The Low Input Sustainable Agriculture (LISA) program, which is now the Sustainable Agricultural Research and Education (SARE) program, initially focused upon sustaining the quality of agriculture's natural resource base almost entirely through the search for technological alternatives to agricultural production technology that is environmentally harsh. However, the agenda has broadened, first out of recognition that Congress, as well as the public, had a strong interest in quality of life issues as they affect farm people and rural communities.

Formally, this broadening of focus occurred under the rubric of “Quality of Life.” In 1991 John Ikerd, an agricultural economist active in the Sustainable Agriculture movement from its beginning, organized a national “Quality of Life” task force under the sponsorship of the SARE program. The Task Force pointed out that:

The intent of Congress regarding quality of life issues was further clarified in a response to a request by Representative Tim Penny of Minnesota. He received

agreement from the Chairman and ranking minority member of the House Agricultural Research subcommittee confirming that quality of life research includes research to “increase income and employment--self employment--opportunities in agricultural and rural communities and strengthen the family farm system of agriculture, a system characterized by small and moderate sized farms which are principally owner operated” (Congressional Record 10/22/90:H11128).

It is under this mandate that the Sustainable Agriculture Research and Education (SARE) program funds were appropriated. Projects funded under this program should, accordingly, respond to these purposes (QOL Task Force, 1994, pp. 3-4).

The Task Force assembled a variety of materials dealing with quality of life issues in agriculture and in rural communities and offered training to SARE Councils and Technical Committees in an attempt to broaden the focus of the program (QOL task Force, 1994). A significant element of its focus was upon the link between agriculture, agricultural development, and rural communities and rural community economic development and upon trying to stimulate more research and extension commitment to these issues.

Community economic development strategies are also undergoing a significant change consistent with sustainable agriculture incorporating critically important quality of life issues. The old strategies of industrial recruitment through building industrial parks by offering tax breaks has given way to growth-from-within policies. ... Sustainable agriculture is a growth-from-within approach to rural economic development. It is an asset-based rather than deficiency-based strategy where human capital is more highly valued than financial capital. Intellectual capital, as it is employed, is enhanced in value rather than depleted as are other resources. It is the “virtuous cycle” of education, increased innovation, increased investment, increased value, and higher wages. Sustainable development offers an alternative to the vicious cycle of industrial recruitment, low wages, declining emphasis on education, declining communities, and resulting downward spiral (QOL task Force, 1994, p. 4)

At the same time, Jim Worstell's SARE-funded “State of the South” project was attempting to develop priorities for the program in the southern region. Although technical issues of agricultural production are important, it quickly became clear that issues more important in the minds of most farm families are those not dealt with on the farm per se: policy issues, markets, relationship of agriculture to the local community, the quality of life, etc. (Worstell, 1994).

This has spawned a group of agriculturalists, or agricultural advocates, who now have embraced community development but seem to insist that their community development is different from that practiced by others--theirs is “sustainable” and that practiced by others is not. (This claim will be

examined later.) What certainly is unique is the proposal to reestablish for rural communities the link between community development and the communities' natural resource-based economy.⁴

The origins of the sustainable agricultural movement are complicated. Several things played key roles. First, there was the agricultural and rural crisis of the early 1980's, the combined result of reckless expansion that immediately preceded the crisis and the government's stubborn insistence upon keeping the value of the dollar so high that the U.S. experienced a massive loss of overseas markets. Agriculture is, of course, eminently a global business. Hence the inability to sell abroad was a severe blow to agriculture. At the same time, there was a massive loss of low-wage, light industry employment in rural areas, employment which had just made a massive move into rural areas during the "rural renaissance" late 1960's and 1970's. This employment drain also resulted from the high value of the dollar--"do-dads" could be made much more cheaply in Mexico, Thailand, or wherever. The agricultural and rural crisis had softened up America's agricultural establishment to the point that it was at least willing to look at alternatives. Fortuitously, there was a whole group of environmental, organic agriculture, and related organizations in the wings (like Rodale, the Kerr Center, NCAT, etc.) prepared to do the hard political work to effect a substantial change in U.S. agricultural research direction and policy. So, we got LISA, and then SARE.

Some of the options to be considered for sustainability include when focusing upon agriculture include:

- Sustaining the quality of soil, air, and water
- Sustaining a particular form of agriculture
- Contributing to the sustainability of particular farms or enterprises
- Sustaining a link between agriculture and community life
- Sustaining the quality of neighborhood and community life in rural communities
- Sustaining particular rural communities
- Sustaining the quality of neighborhood and community life in general
- Sustaining the sense of community--wherever it may be possible

As the agenda of sustainability in agriculture has expanded beyond the quality of the natural resource base, it has moved down on this list. As that occurs it becomes obvious that the different sustainability goals are not necessarily compatible. For example, were we in a serious natural resource base crisis, it would at least be worth asking whether the quality of the natural resource base might be enhanced most efficiently by massive abandonment of some lands and even communities, and by producing agricultural products in a highly artificial manner in a few optimum locations.

⁴ The Rural Community Development practice that emerged from the CRD era of the late 1950's and early 1960's tended to explicitly exclude agriculture from the community economic development agenda. This was based upon several arguments. First, farm groups felt that human resources ought to be moved out of agriculture, rather than be encouraged into agriculture, since agriculture was becoming more and more capital intensive anyway. Second, the data on rural economies continued to show a declining role for the agricultural sector of the economy. Finally, diversification was viewed as desirable, even essential, for natural resource-dependent communities.

What is only now beginning to emerge in the SARE program has been anticipated for some time by the Kellogg Foundation and is the basis of an ambitious effort to link rural community development and sustainable agricultural development in the Sustainable Communities project, which is administered at the University of Missouri by John Ikerd. The focus of this project is the sustainable development of rural communities. As the project paper states:

The primary objective of this project is to encourage and support rural community development strategies which will challenge the conventional wisdom concerning the future of rural communities and the future role of agriculture in community development by demonstrating the following proposition in three communities in each of three states:

A fundamental shift in foundations of economic development, from land- and capital-based to knowledge- and information-based, and increasing public concerns for the natural environment provide new opportunities for sustainable development in rural communities linked with the development of a sustainable agriculture.

The program has three primary thrusts: (1) assessing community human and natural resource capacities with respect to opportunities for knowledge-based, resource-linked community development, (2) developing the local leadership skills needed to sustain development over the long run, and (3) facilitating model community development projects to demonstrate the potential for sustaining rural communities through people-centered, systems-oriented, community-based development strategies which include sustainable agriculture (Ikerd, 1994, pp. 6-7).

In process the project also intends to develop and demonstrate a new model for research and extension, a model which relies upon participatory research and information sharing rather than technology development and transfer.

Three states, Nebraska, Michigan, and Missouri collaborate in the project. The Nebraska effort is focused upon the small agricultural town of Kimball in the southwest corner of the state. In Michigan the three project sites are Montmorency county, Huron county, and Marlette. In Missouri the project is spread across the four northeastern most counties of the state, from Putnam across to Clark. The project provides for the employment of a Community Development Facilitator in each state. Although there is considerable flexibility in how the project is being implemented, the Facilitator has organized local action teams, task forces, or advisory committees in each of the target communities. These local groups provide leadership to the community development effort, with staff support and guidance from the facilitators. In most cases support teams have been organized in the Cooperative Extension Services, although the strength of this link to CES varies among the three states.

A key focus of the project is to try to mobilize and empower a wide range of concerned citizens, especially those whose voices may not have been heard much before, and to assist them in defining the future for their own communities and taking the actions necessary to make this future a reality.

The Sustainable Communities project has only had one year of life, so it is too early to try to evaluate it. However, it is clear that it has already generated a considerable amount of enthusiasm among local participants, many of whom are dedicating very significant amounts of time to the project.⁵ Although it is easy enough to question the realism of an effort that seeks to revitalize small rural communities primarily through agriculture, there is no question that this approach is attractive to the people in the target communities. It has great promise as an experiment, especially since there is considerable variation in the details of how the project is being implemented in the respective states and communities.

Again, we have an effort whose origins are completely outside of community or community development which increasingly recognizes the importance of the local community to its agenda, but which has not yet taken the community, community processes, and the rich literature on community and community development seriously. It does not, however, hesitate to claim hegemony and to be critical of “conventional” community development, about which it is, for the most part, poorly informed. Its key strengths are its potential for merging community and agricultural development efforts.

Community Viability Assessment: Bringing the Human Dimensions into Ecosystem Management

It is characteristic of the sustainability contexts above that the community is incidental to both regional, national or global environmental sustainability and the redefinition of progress or development. The community was the “act locally” tail of the sustainability and progress measurement dog, at least initially.

It's not that no one has thought of these issues or that there is no literature on them. It's just that the folks in the sustainability movement appear to have backed into their concern about community. Like many now holding forth about the wonders of “social capital,” they apparently are completely ignorant of the rich literature that exist on the sociology of community and community development.

There are several recent efforts that do focus upon community.⁶ They occur in the context of the Forest Service, USDA, and its efforts to deal with its responsibility to forest-dependent communities as its decisions affect these communities' economies and as the Service adopts Ecosystem Management. These efforts follow in a tradition of expressed responsibility for contributing to “community stability,” on which the Forest Service does not have a good record.

⁵ The senior author serves as an external evaluator on the project and has visited all of the project sites between June and November of 1996. A rather lengthy report has been prepared on Kimball, Nebraska, and very brief reports have also been prepared on the Michigan and Missouri sites. Fuller reports on the latter two states are forthcoming.

⁶ This section depends heavily upon the excellent chapters by Kusel (1996) and Doak and Kusel (1996) in the report of the Sierra Nevada Ecosystem Project.

The earliest effort is the frequent study of well-being in a forest community carried out by Harold and Lois Kauffman in Montana in 1946 (Kaufman & Kaufman, 1946).⁷ Kusel says, of their work, “In one of the first calls for public involvement, the Kaufmans suggest that the Forest Service involve the public in the formulation of forest policy to ensure that the concentration of economic power does not result in the abrogation of public interests and concerns. They maintain that such involvement should be 'extensive' (Kaufman & Kaufman, 1946, p. 85). The Kaufmans' study is rare in its attention to these issues” (Kusel, 1996, p. 363).

Kusel and Fortmann (1991) evaluated forest communities for their general well-being and for the capacity to maintain and enhance that well-being. This study concluded communities are strongly impacted by forces outside a community's control, such as:

outside employers, natural-resource decision makers, and outside money. In contrast to studies characterizing the 'inevitable' culture clash between newcomers and long-standing residents (see, for example, Price and Clay 1980 and Schnaiberg 1986), Kusel and Fortmann note that recent in-migrants and women play crucial roles in mobilizing community action and increasing local capacity (Kusel, 1996, p. 364).

A major effort was carried out by the Forest Ecosystem Management Assessment Team (FEMAT), which was created by President Clinton to “identify management alternatives that attain the greatest economic and social contribution from the forests of the region and meet all requirements of applicable laws and regulations” (FEMAT, 1993, p. ii). As Kusel points out, their is “. . . one of the first large-scale, American ecosystem studies that attempts to explicitly include and assess human communities” (Kusel, 1996, p. 364). FEMAT scientists focused upon 57 counties in Washington, Oregon, and California that were wholly or partially within the range of the northern spotted owl. These counties contain 347 communities. The social analysis they performed focused upon 219 of these communities (Forest Service, USDA, 1994, p. 298).

The community analysis entailed five efforts. First, a survey was sent to state extension agents to solicit background information and an overall rating of the communities' general adaptability in response to change. Second, a report was prepared based on census data that summarized various demographic changes. . . . Third, two workshops involving nearly 100 participants from a variety of state and local agencies and offices, as well as American Indian reservations, prepared detailed analyses of the relative ability of the communities to deal with changes likely to result from the alternative on a state-by-state basis. Fourth, a review of the American Indian tribal lands, rights, and uses was undertaken. Fifth, specialized papers were commissioned to provide detailed expert opinion and analysis of key areas (FEMAT, p. 300).

⁷ The Rural Sociological Society's Rural Poverty Task Force spawned a series of specialized studies, including some dealing specifically with resource-dependent communities. Excellent theoretical work on poverty in resource-dependent communities was published in *Society and Natural Resources*, Vol. 7, Nos. 1 and 3, 1994.

In the two workshops held to assess community capacity, the concept was treated as an independent variable that could, in part, determine community response to and the consequences of land-management alternatives. Communities with higher capacity were considered more adaptable and likely to be less affected. The assessments were made primarily by various experts (Kusel, 1996, p. 364).

The Assessment Team did not release information about the results for specific communities. They reasoned that to do so could result in reactions on the part of community people, “red-lining” by financial institutions, etc. Also they felt that identifying particular communities negatively might paralyze and demoralize community members (FEMAT, p. 300). They did, however, provide a detailed discussion of the relationship between their viability assessment results and the various alternatives being considered by the FEMAT. They also made specific recommendations about Forest Service Rural Community Assistance program options in attempting to ameliorate the potential negative effects of whatever option was chosen (FEMAT, pp. 313-314.)

A more recent effort, performed later in the Sierra Nevadas is reported by Kusel and his associates (Kusel, 1996; Doak and Kusel, 1996). After an extensive discussion of social indicators and measures of well-being, Kusel makes the case for a focus upon the community and specifically rejects the county as a surrogate (Kusel, 1996, p. 366). He defines community capacity as

... the collective ability of residents in a community to respond (the communal response) to external and internal stresses; to create and take advantage of opportunities; and to meet the needs of residents, diversely defined. It also refers to the ability of a community to adapt to and respond to a variety of different circumstances. Community capacity depends on three broad areas (1) physical capital, which includes physical elements and resources in a community; (2) human capital, which includes the skills, education, experiences, and general abilities of residents; and (3) social capital, which includes the ability and willingness of residents to work together for community goals (Kusel, 1996, p. 369).⁸

⁸ Leonard S. Cottrell, Jr., wrote, in 1976: “For our present discussion, a competent community is here conceived as one in which the various component parts of the community: (1) are able to collaborate effectively in identifying the problems and needs of the community; (2) can achieve a working consensus on goals and priorities; (3) can agree on ways and means to implement the agreed-upon goals; and (4) can collaborate effectively in the required actions. It is proposed here that a community that can provide the conditions and generate the capabilities required to meet the above performance tests will be competent to cope with the problems of its collective life.” This was reprinted from Chapter 11, “The Competent Community,” in Kaplan, et al. (1976), in an earlier phase of interest in the community during the War on Poverty, when the model generating concern about community was not sustainability but “community opportunity structures,” and ameliorating juvenile delinquency in the “gray areas” of urban America (Cottrell, 1983, p. 548). Cottrell then goes on to discuss, in some detail, what he considers to be the characteristics of the competent community, introducing his discussion with the following statement: “What conditions are necessary and what specific capabilities must be developed to enable the community to function competently as a community? What operations are required to provide the necessary conditions and capabilities?”

So far as I know, there are presently no systematic, logically complete, empirically tested answers to these questions. The best we can do at the moment is to make a start by drawing on fragments of practical experience, observation, and relevant conceptualization to identify what appear to be essential conditions that must be obtained to a substantial degree in the community if it is to function effectively as such.” He then identifies commitment, self-other awareness and clarity of situational definitions, articulateness, communication, conflict containment and accommodation, participation, management of relations with the larger society, and machinery for facilitating participant interaction and decision-making as the key elements, each of which he discusses in some detail (pp. 549-550).

He then quotes those now famous for the use of the concept of “social capital,” Robert Putnam (1993) and Flora and Flora (1991).⁹ Based upon this conceptual work, Doak and Kusel report on their own assessment of community capacity in what ultimately became 182 “aggregations” or communities across the Sierra Nevadas. They developed a socio-economic scale, a community capacity scale, and carried out several detailed case studies focusing upon the local meaning of these scales. They used both an expert assessment technique and self-assessment by community residents. Both were done in workshop settings. They then provide a detailed discussion of the results of their assessment among the various sub-regions of the Sierra Nevadas. They say, for example, that:

Community capacity varies widely across the Sierra Nevada. The three components of community capacity (physical, human, and social capital) sometimes appear to be in conflict with one another. That is, where human capital is perceived as being high or increasing, social capital may be low or in decline. This is particularly true where well-educated retirees or professionals fail to work cooperatively on community issues with one another or with longer-term residents. Community history is an important contributor to the human and social components of community capacity. There are a number of aggregations, particularly in the southern Sierra, in which medium-high and high capacity was linked to a long history and the continued presence of multiple old families” (Doak and Kusel, 1996, p. 399).

Rural Development in the Forest Service, USDA

A further elaboration of the ideas brought together by Kusel and his associates, ecosystem management, sustainability, community viability and community capacity, and social capital provides the background for a current and rather ambitious effort emerging from the U.S. Forest Service's Rural Community Assistance Program. It is being promoted both as a mechanism for engaging community people in setting sustainability goals for their community and also as an overall rubric for evaluating the impacts of the Rural Community Assistance Program.

The 1990 Farm Bill provided funding and authority for the U.S. Forest Service to become active in Rural Development. Helping to contribute to community stability for forest-dependent communities had always been a stated objective of the Forest Service. However, it had few direct instruments with which to try to contribute to community well-being other than direct and indirect impacts that timber sales and recreation had upon these communities' economies and through its technical assistance authority, which was seldom used to serve forest-dependent community concerns. The 1990 Farm bill and the FEMAT (for the northwest) changed that.

Through its State and Private Forestry (S&PF) branch, community assistance was provided under several titles. Since then a very viable community assistance program with a viable community development strategy has emerged. National Conferences have been held in Little Rock, Arkansas

⁹ Of course, this is a relatively “thin” version of previous work on the “good” or “competent” community (Warren, 1970; Cottrell, 1983) and are essentially the same as the widely accepted “process” objectives of community development practice (Voth and Brewster, 1989).

in 1993, in Ithaca, New York, in 1994, and in Knoxville, Tennessee in 1995. The next one will be held in Oregon this summer.

In association with this effort the Aspen Institute, the North Central Regional Center for Rural Development, and several other collaborators, with funds from the Ford Foundation and the Rural Community Assistance Program of the Forest Service, have developed a draft workbook for use by communities' Community Action Teams. The workbook outlines both a community development process and a set of "outcomes" which can be used by communities to set goals, monitor progress, and stimulate community involvement in community development activities. It outlines five overall sets of outcomes: (1) increased skills, knowledge, and ability of local people; (2) improved community initiative, responsibility, and adaptability; (3) strengthened relationships and communication; (4) sustainable, healthy ecosystems with multiple community benefits; and (5) appropriately diverse and healthy economies (p. 4).

The workbook focuses heavily upon clear specification of goals--in measurable terms--and upon community-level monitoring and measurement. It provides a wide range of suggestions for use as key indicators.

This effort is part of a larger effort on the part of the Forest Service to improve its approach to and relationship with the communities most affected by the Forest Service's public lands management responsibility.

Dr. Cornelia Flora, Director of the North Central Regional Center for Rural Development and an active participant in this effort, together with her colleagues, has laid some groundwork in developing the necessary linkage between the sustainability movement on the one hand and authentic community issues on the other (Flora and Flora, 1995). Like Kusel, she does so under the rubric of Putnam's concept of "social capital," pointing out that "Social capital and social infrastructure are a necessary but neglected part of sustainable development" (Flora and Flora, 1995, p. 12). She identifies various forms of capital required for community "resiliency," including physical capital, human capital, environmental capital, and social capital.

Here we have a genuine focus upon community, not only in the development of sustainability indicators themselves, but indicators that have something to do with the fundamental properties of "community," or of "communities," as places where people live. Here key questions like "what is the capacity of a community to respond to challenges it must confront?", or "how viable is this community?" are at least raised. The fragility of the answers that emerge illustrates both the difficulty of focusing upon the idea of "community" sustainability, and its empirical unpredictability.

Planning, Community Design, and Growth Management (Sustainability by Design)

This is the final context in which the idea of sustainable communities has gained currency which we mention, though only briefly. Like most of the rest of the sustainable communities movement, this context is characterized by variety of rules and principles. These rules and principles include

aesthetic concerns, concerns about the efficient use of space, and at least an expressed interest in the relationship between space, space design, and the rules of human behavior. There is much debate among the various “schools” of urban design, and each has its own sense for what “ought” to be. The “new urbanism,” for example, has a hate relationship with the automobile (Kunstler, 1993). For outsiders like us the actual empirical base for many of these rules seems to be extremely weak, if not non-existent.

Roseland characterizes much of this literature in his literature review cited above. He describes the conflicting views regarding the actual costs of urban sprawl in this way:

[T]he bottom line is that poor planning, or no planning, is responsible for many of the ills attributed to urban sprawl, and that more and better planning that encourages compact developments would lead to more sustainable and livable urban environments. Not surprisingly, the most vocal opposition to such planning has come from urban economists. They contend that, in the long run, sprawl may not necessarily be inefficient, and that price structure is a better way to correct land use inefficiencies than additional layers of government regulation” (Roseland, 1994, p. 5).

He continues with a brief description of several strains of “sustainability by design”, including “neotraditionalists” like Leon Krier and his well-known students Andres Duany and Elizabeth Plater-Zyberk, and Christopher Alexander who wrote “A Pattern Language” suggesting a type of participatory architecture (Roseland, 1994, p. 5).

One thing that can be said about sustainability by (community) design is that the community actually is at the center of the conversation in this case, which is not true of much of the other sustainable communities literature.

An Assessment of Community Sustainability

There is, unfortunately, little in community sustainability that deals with issues of infrastructure. That's too bad, since one would have thought two things--infrastructure and economic base--would have been central. The reason is quite simple, though. Community sustainability has, until now, had very little to do with sustaining either community as a property or communities as places.

The community sustainability movement does, however, have many positive features, as follows:

Focus upon Environmental and Resource Issues

Focus upon local, regional, and global environmental issues; upon natural resources and the relationship of these to local community actions; and their relationship to or integration into local community development. As we indicate below, the movement's claim that it alone advocates

holistic development is absurd. It does, however, make a very important contribution in bringing environmental and resource issues into the conversation.

Represents a Popular Yearning for “Community Agency”

The sustainability movement has tapped – and has the potential to continue to tap and mobilize – a strong popular concern about the quality of community life. Even more importantly, local people in counties, communities and neighborhoods respond to the possibility of being able to gain some control over the future of the places in which they live.

Thus, the community sustainability agenda has powerful potential for mobilizing community action or “agency” (Bhattacharyya, 1995; Luloff & Swanson, 1994). There are several contextual manifestations of this:

(1) Natural resource dependent communities or communities that were at some time in the past resource dependent. This includes both agricultural and forest-dependent communities. For agricultural communities, the expansion of the sustainable agriculture agenda and the application of a sustainable communities agenda in the context of agricultural development resonate very strongly with farm and town people in devastated small, rural communities which are being targeted as sites for the establishment of “onerous facilities” like waste dumps, large-scale livestock production and processing facilities.

For forest-dependent communities, or formerly forest-dependent communities, the sustainable communities agenda provides an excellent platform for engaging community people in visioning, strategic planning, and goal-setting for their communities.

(2) Large cities with large environmentally conscious populations willing to devote time and energy to an overall global, national, regional, and local environmental agenda. Sustainable Seattle is an example.

(3) People in neighborhoods anywhere who are concerned about, and willing to commit time to, improving the “sustainability” of the quality of life in their own neighborhoods. The emphasis upon a local process of criteria development, measurement, and monitoring provides an excellent and increasingly popular strategy community people can use to try to gain control of the places where they live.

Indicator Identification, Development, and Monitoring

Perhaps the movement's greatest contribution will be its focus upon the development of indicators of development: indicators that supplement or replace conventional economic indicators, more effectively tap in to actual well-being, and incorporate environmental and resource use costs.

Community Focus

Although we are critical of the movement's naiveté about communities and community development, its focus upon the local community as the appropriate arena in which to deal with sustainability issues is positive. It can contribute and indeed, already has contributed to a much-needed, serious emphasis upon communities as the agents for the resolution of what seem to be increasingly messy public policy issues.

Democratic, Participatory Procedures

When moved to the community level, the movement's commitment to open, democratic, participatory procedures and the involvement of the public in dealing with and making decisions about what might otherwise be regarded as highly technical issues is obviously promising.

Emphasis upon Inter-relationships and a Holistic Approach

This is valuable in general, of course, although sustainability movement's claims to exclusivity are unfounded. A peculiar strength in this regard, however, applies to rural and agricultural communities. Since the early 1960's conventional rural development has operated on the basis of a radical separation of agriculture and rural development This separation had several components.

Conventional agriculture (Farm Bureau, for example) strongly supported this separation for several reasons. First, it supports the movement of (other, less worthy) human resources out of agriculture, so as to preserve the "benefits" for the few left. Hence, it did not support trying to enhance the role of agriculture but has always supported displaying or demonstrating the importance of agriculture. Second, having grasped the effectiveness of the epitaph "social program" for everything that did not benefit it, conventional agriculture early on decided not to support anything tainted of concerns like "social well-being".

The data itself supported the separation. The actual contribution of agriculture to the economy of most rural communities is relatively minor--most money comes from other sources. Finally, bureaucratic dynamics contributed to a separation. Those concerned about rural development were beleaguered in an environment where virtually all public resources of USDA, the Land Grant System, and other programs had been captured by commercial agricultural interests. As a result, they were very jealous of the slim resources and narrow program authority they had. The Sustainable Communities agenda has, in one fell swoop, obliterated the chasm separating rural development and agriculture within the USDA community.

As we have indicated throughout the paper, for community development practitioners the sustainable community movement presents some severe disappointments and has some serious weaknesses, as follows:

Top-down

The conversation is still primarily a top-down conversation. Regional, national, and global sustainability is the issue; the intelligentsia defines what this is and what it means. The community is largely incidental, though it is recognized as important as the arena in which actions can be taken and community people are seen as the “work force” for achieving sustainability goals.

Absence of the Community in Community Sustainability

Consistent with the first, other than some pretty superficial stuff about participatory methods and Flora's generalizations about entrepreneurial communities, there is very little about community or communities. First of all, the idea of community sustainability *per se* hardly exists. The vast literature on the “good” community remains untapped and outside the conversation. Vague abstractions like “social capital” are discussed, but few details are provided about what really makes a community sustainable in terms of infrastructure, economics, culture, decision-making processes, and so on. To elaborate a bit, one finds little evidence of use of Kemmis' insights, which have to do--in part at least--with the peculiar dynamics of community-level compromise and decision—making. This is true even when it comes to basic environmental and sustainability issues.

Exaggerated Claims

The movement's claims to uniqueness with regard to community and community development are grossly exaggerated. Holistic community development is not at all unique to this movement. Indeed, it was, and continues to be, one of the major ideological commitments of almost any definition of “conventional” community development (Voth and Brewster, 1989, pp. 280-306. The same goes for participation, equity concerns, and a whole list of “progressive” parts of the sustainable community agenda. The movement’s portrayal of “conventional” community development is woefully distorted. From much of this literature, one would infer that, until the sustainability movement appeared, community development meant only smokestack chasing, forest raping, and large-scale, highly integrated agricultural production and processing facilities.

Distorted Perception of and Naiveté about Community and Community Development

One of the sustainability movement's greatest weaknesses is it displays not even the slightest familiarity with the literature on community, on community processes, or with the Community Development that preceded it, several fads back, in the international development community. This international development movement shared most of the current sustainability movement’s progressive principles (e. g., holism; democratic, participatory procedures; use of local capacities and resources, including local leadership; linking with a larger, regional and national agenda). Indeed, one of the main reasons given by some for the rapid demise in this type of “progressive” Third World development in the 1960's was precisely its excessive focus upon the “process” components,

community well-being and “consumptive” values to the detriment of economic development and productive activities that could “pay for” investments in such vague things as “social overhead capital” (Holdcroft, 1978).

Ideological Agenda

The sustainability movement in general and in its more specific approach to the community is clearly ideological and displays a distinct bias in the global population, resources, and environment debate. It is clearly committed to the assumption of limits and rejects the more optimistic and expansionist views of people like Julian Simon (Simon, 1981; Simon and Kahn, 1984) or the Hudson Institute. One is tempted to say it exists precisely to impact or even control this debate. Managing this ideological bias as the movement engages communities and community issues could become very complicated. Our reading is that one thing community people do not want is to become the cannon fodder for outsiders’ ideologies. The President’s Commission has, not surprisingly, already been attacked by the Farm Bureau for its ideological bias.

Need to Clarify What Is Meant by Both Community and Community Sustainability

This is, perhaps, not so much a criticism as a necessary next step for the sustainability movement, if it wants to take community seriously. It has already contributed to moving towards a genuine community-based agenda. However, it has done so without giving any serious attention to what is meant by its key concept, community, or its apparent bete noir, “conventional” community development. Clarification will almost certainly lead to taking the role of community much more seriously, including delving into the literature on the ethical implications of community development. As was true of the War on Poverty, when communities seize a community-based agenda that is offered to them, the results can be both unexpected and often unappreciated by others. What would happen, for instance, if a particular community decided it had to cut ancient redwoods to be sustainable? Communities can certainly be expected to come up with creative--and workable--ways of dealing with conundrums such as the endangered species legislation, perhaps in ways that will create havoc for national environmental organizations and national legislation.

Description of “Conventional” Community Development

So, what, if anything, does all of this has to do with “conventional” community development? To try to answer this, we must digress, to give our “conventional view.”

To us, “Conventional Community Development,” if there really is any such thing, can be defined as ideology, science, and intervention (Voth and Brewster, 1989). As ideology it includes--and has always included--local action, participation, and a variety of other inherent values. As science it has an economic dimension, a demographic dimension, and a physical dimension. Its basis as local, participatory action is primarily its social, cultural and political dimensions. When viewed from the

perspective of socio-political intervention or social engineering¹⁰, these can be summarized by four or five more or less generic processes of community socio-political life, illustrated in the schema below:

Figure 1
Generic Community Processes

Generic Community Processes	
Development and exercise of leadership	These lead to typical outputs like community well-being or lack of it
Mobilization and involvement of citizens	
Creation and use of organization	
Community planning, goal-setting and decision-making	
Implementation of policies, plans, and projects	

Each of these implies a range of potential interventions, in principle accessible both to outside community development practitioners as well as to local residents who wish to improve their community in some way. It is these interventions, those who make them, and the programs or policies that try to put them in place that constitute community development.

The link between a particular intervention and the community process it is intended to affect is always problematic. It is quite clear, for example, that the quality of community leadership is a major determinant of community well-being. It is not at all clear, though, that well-intentioned and well-designed efforts to improve community leadership (e. g., leadership training) can be effective. Some say that the only thing that has any hope of working is a few key funerals.

These problematic relationships between community development interventions, generic community processes, and community outcomes define the territory of community development as applied science and applied scientific investigation.

¹⁰ Community Development interventions in the economic, physical, demographic dimensions imply their own unique models of community reality. Much of the economic dimension can be captured in models built around the input/output model, the physical dimension is built around human ecology, land use and land use processes, physical planning and design; and the demographic dimension, of course, involves the dynamics of a (community) population.

Figure 2

Community Development Interventions
and Generic Community Processes

Community Development Interventions	Generic Community Processes	Outputs and Consequences
Leadership training and development	Development and exercise of leadership	COMMUNITY WELL-BEING Process and content objectives
Citizen surveys, town meetings, etc.	Mobilization and involvement of citizens	
Organizational development and training	Creation and use of organization	
Decision aids, impact analysis, policy education, strategic planning	Community planning, goal setting, and decision making	
Feasibility studies, technical assistance, how-to-do-it guides, success stories, networking with others, etc.	Implementation of policies, plans, projects	

Conventional community development has focused upon leadership training to improve community leadership; upon organizational development; upon citizen mobilization through the use of needs assessment, or asset-based surveys, public meetings, etc. It has focused heavily upon project identification, design, proposal-writing, and project implementation and even upon planning, goal-setting, and decision-making.

Conclusion

The community processes outlined above bear on many of the topics discussed in sustainability community literature. In “conventional” community development, two commonly used techniques for engaging the community are leadership training and needs assessment. However, the sustainability movement provides an additional, slightly different “handle” for engaging the community. In its emphasis upon indicator development and monitoring, the sustainability movement engages community people by focusing on planning, goal-setting and decision-making as well as monitoring. It may well be that these processes themselves will contribute to the expansion (or creation) of community agency and capacity. The processes may turn out to be as important for

the community's well-being as the particular sustainability goals or indicators which are the intended outputs.

Using a community's sustainability (or lack thereof) as an organizing principle encourages community people to deal with the linkages between economic, environmental, and social goals and problems. This approach provides an integrated framework for several "conventional" community development processes and as such is a positive contribution. Although not new or exclusive to the sustainability movement, the emphasis on a holistic approach provides an atmosphere conducive to finding "common ground" among diverse, and perhaps divergent, interests in a community. It is also apparent the community sustainability movement brings a strong focus on environmental issues to community development.

It is equally clear that "conventional" community development has much to contribute to the discussions of the community sustainability advocates. In addition to the rich literature already mentioned, much practical knowledge about community processes has already been developed and is available for use in addressing the issues raised by the sustainability movement. The sustainability movement need not reinvent the wheel.

Whether one comes to the conversation about sustainable communities first from the perspective of community development or from an environmentally-based sustainability, we can agree it is in "community" our future rests.

References

- Adams, Bruce
1996 Building Health Communities, Charlottesville, VA: Pew Partnership for Civic Change (http://www.cpn.org.sections/tools/manuals/pew_healthy_com.html).
- American Farm Bureau Federation
1996 "Sustainable America. 'Zeroing out the Constitution," Public Policy Digest, Vol. 3, No. 3, May, pp. 1-3.

- Aspen Institute
 1996 Measuring Community Capacity Building. Economic Policy Program, Aspen Institute.
- Barber, Benjamin
 1984 Strong Democracy: Participatory Politics for a New Age. Berkeley: University of California Press.
- Bhattacharyya, Jnanabrota
 1995 "Solidarity and Agency: Rethinking Community Development," Human Organization, Vol. 54 (No. 1), pp. 60-68.
- Campbell, Angus and Philip E. Converse (eds)
 1972 The Human Meaning of Change. New York: Russell Sage Foundation.
- Cottrell, Fred
 1951 "Death by Dieselization: a Case Study in the Reaction to Technological Change," American Sociological Review, Vol. 16 (June), pp. 358-365.
- Cottrell, Fred
 1972 "Caliente," in Technology, man and process. Columbus, Ohio: Charles E. Merrill Co., pp. 67-86 (reprinted in Rodefeld, Richard D., et al. (eds.), Change in Rural America: Causes, Consequences, and Alternatives. St. Louis: Mosby, pp. 328-337.
- Cottrell, L. S.
 1983 "The Competent Community," in Roland L. Warren (ed.) New Perspectives on the American Community. Homewood, Ill: Dorsey Press, pp. 401-411.
- Doak, Sam C., and Jonathan Kusel
 1996 "Well-being in Forest-Dependent Communities, Part II: A Social Assessment Focus," in Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. II, Assessments and Scientific Basis for Management Options. Davis, CA: University of California, pp. 375-402.
- Doing Democracy
 1996 "Communities Devise Sustainability 'Indicators' to Guide Development, Doing Democracy, Spring, p. 3.

Flora, Cornelia Butler

- 1990 "Sustainability of Agriculture and Rural Communities," in Francis, Charles, Cornelia B. Flora, and Larry D. King, (eds), *Sustainable Agriculture in Temperate Zones*. New York: John Wiley & Sons, 1990, pp. 343-359.

Flora, Cornelia Butler and Jan L. Flora

- 1988 "Characteristics of entrepreneurial communities in a time of crisis," *Rural Development*, Vol. 12, No. 2, pp. 1-4.

Flora, Cornelia B., and Jan Flora

- 1995 *The National Rural Development Partnership and Entrepreneurial Social Infrastructure: Building a Sustainable Community of Interest*. Ames, Iowa: North Central Regional Center for Rural Development.

Flora, Jan L., and Cornelia B. Flora

- 1991 "Local economic development projects: Key factors," in N. Walzer (ed.) *Rural community economic development*. New York: Praeger, pp. 141-156.

Ford Foundation

- 1973 *Community Development Corporations: A Strategy for Depressed Urban and Rural Areas*. New York: The Ford Foundation.

Forest Ecosystem Management Assessment Team (FEMAT)

- 1993 *Forest ecosystem management: An ecological, economic, and social assessment*. Report of the Forest Ecosystem Management Assessment Team (July). Washington, D. C.: U.S. Forest Service.

Forest Service, USDA

- 1994 *Final Supplemental Environmental Impact Statement, Vol. I*. Washington, D. C.: U.S. Forest Service.

Hardi, Peter and Laszlo Pinter

- 1995 *Models and Methods of Measuring Sustainable Development Performance*. Winnipeg, Manitoba: International Institute for Sustainable Development.

Hart, Maureen

- 1996 *Hart Environmental Data: Measuring Progress toward sustainability* (<http://www.subjectmatters.com/indicators/html>).

- Holdcroft, Lane E.
1984 "The Rise and Fall of Community Development, 1950-65: A Critical Assessment," in Carl K. Eicher and John M. Staatz (eds.), *Agricultural Development in the Third World*. Baltimore and London: Johns Hopkins University Press, pp. 46-58.
- Ikerd, John, John Allen, Laura DeLind, Duane Ford, and Susan Smalley
1994 *Sustaining Rural Community Development through Sustainable Agriculture*. Proposal presented to the W. K. Kellogg Foundation, Battle Creek, MI, August.
- Kemmis, Daniel
1990 *Community and the Politics of Place*. Norman, Oklahoma: The University of Oklahoma Press.
- Kimmons, Tom
1990 "The function of language and hope in Community Development," Paper presented at the Annual Meetings of the Community Development Society, Little Rock, AR.
- Kunstler, James Howard
1993 *The geography of nowhere: The rise and decline of America's man-made landscape*. New York: Simon and Schuster.
- Kusel, Jonathan
1996 "Well-Being in Forest-Dependent Communities, Part I: A New Approach," in *Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. II, Assessments and Scientific Basis for Management Options*. Davis, CA: University of California, pp. 361-373.
- Kusel, Jonathan, Sam C. Doak, Susan Carpenter, and Victoria E. Sturtevant
1996 "The Role of the Public in Adaptive Ecosystem Management," in *Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. II, Assessments and Scientific Basis for Management Options*. Davis, CA: University of California, pp. 611-624
- Lackey, Al, Robert Burke, and Mark Peterson
1987 "Healthy Communities: The Goal of Community Development," *Journal of the Community Development Society*, Vol. 18, No. 2, pp. 1-17.
- Luloff, A. E.
1980a "The Good Community: A rural Sociological Perspective," *Newsline*, Vol. 8 (No. 4, July), pp. 44-48.
- Luloff, A. E.
1980b "The Good Community Revisited," *Newsline*, Vol. 8 (No. 4, July), pp. 53-56.

Luloff, A. E., and L. E. Swanson

- 1994 "Community Agency and Disaffection: Enhancing Collective Resources," in Lionel J. Beaulieu and David Mulkey (eds.), *Investing in People: The Human Capital Needs of Rural America*, pp. 251-372.

McWilliams, Ruth and Fred Patten

- 1995 "Partnerships for Progress: Forest Service's Collaborative Approach to Sustaining Forests and Rural Communities," Paper presented at the Land Use Planning and Design session at the SAF National Convention held in Portland, ME, on October 28 to Nov. 1.

McWilliams, Ruth

- 1996 "Keynote Address," at the 4-State Heartland Community Development Conference entitled "Woodland and Forest Resources for Sustainable Community Development," held in Fayetteville, AR, October 31 to Nov. 1.

National Sustainable Agriculture Quality of Life Task Force (QOL Task Force)

- 1994 *Sustainable Agriculture and Quality of Life: Report of the Task Force (and QOL Training Manual)*. Columbia, MO: Dr. John Ikerd, Dept. of Agricultural Economics.

North Central Regional Center for Rural Development

- 1996 *Working Toward Community Goals: Helping Communities Succeed. Draft Workbook for Community Action Teams. Collaborating with the Rural Community assistance Program of the U.S.D.A. Forest Service*. Ames, Iowa: NCRCRD, Iowa State University.

Northwest Policy Center

- 1996 "Sustainable Community Checklist," *The Changing Northwest*, Vol. 8 (No. 2, October), insert.

President's Council on Sustainable Development

- 1996 *Sustainable America: A New Consensus*, especially Ch. 4, "Strengthening Communities." Washington, D. C.: The Government Printing Office, February.

Putnam, Robert D.

- 1996 "The Strange Disappearance of Civic America," *The American Prospect*, No. 24 (Winter, 1996). (<http://epn.org/prospect/24/24putn.html>)

Putnam, Robert D.

- 1993 "The Prosperous Community: Social Capital and Public Life," *The American Prospect*, No. 13 (Spring, 1993) (<http://epn.org/prospect13/13putn.html>).

Roseland, Mark

- 1994 "Sustainable Communities: An Examination of the Literature," Burnaby, BC, Canada: School of Resource and Environmental Management, Simon Fraser University, March. (Available at Ontario Round Table on Environment and Economy, <http://www.web.net/ortee/scrp/20/22suscomm.html>, as part of Sustainable Communities Resource Page).

Rossi, Peter H.

- 1972 "Community Social Indicators," in Campbell, Angus and Philip E. Converse (eds), *The Human Meaning of Change*. New York: Russell Sage Foundation, pp. 87-126.

Simon, Julian L.

- 1981 *The Ultimate Resource*. Princeton, New Jersey: Princeton University Press.

Simon, Julian L., and Herman Kahn, eds.

- 1984 *The Resourceful Earth: A Response to Global 2000*. New York: Basil Blackwell, 1984.

Sustainable Communities Resource Package (SCRCP)

- 1997 *A Vision of Community Sustainability: Model Principles* (available at Ontario Round Table on Environment and Economy, <http://www.web.net/ortee/scrp/20/23vision.html>).

Sustainable Seattle

- 1995 *Indicators of Sustainable Community: 1995*. Metrocenter YMCA, 909 Fourth Ave., Seattle, WA, 96104.

Sustainable Seattle

- 1996 *News and Updates from the Sustainable Seattle Network and Civic Forum*. Seattle, Issue 12, Spring.

Voth, Donald E., and Marcie Brewster

- 1989 "An Overview of International Community Development," in Christenson, James A., and Jerry W. Robinson, Jr., *Community Development in Perspective*. Ames, Iowa: Iowa State University Press, pp. 280-306.

Voth, Donald E.

- 1996 *Preliminary Assessment Report for Kimball Nebraska*. Fayetteville, AR: School of Human Environmental Science, July.

Warren, Roland L.

1970 "Toward a Non-Utopian Normative Model of the Community," *American Sociological Review*, Vol. 35 (No. 1), pp. 219-227.

Worstell, James V.

1994 "Nature, farmer, university: toward unity between agriculture and ecology in the U.S. South." A report of the State of the South project. December 1994.

Appendix 1: Literature Categories of Roseland

Table 2
Comparisons of the Literature Categories

	Orientation	Focus	Means
Designers	Architects, planners, consultants, and related professionals	New developments	Reducing sprawl; design to encourage the revival of public life (e.g., townscapes, streetscapes, malls and squares)
Practitioners	Politicians, local government professionals, citizens and community organizations	Existing settlements, municipalities	Local initiatives to create local sustainable development action strategies
Visionaries	Agriculturists, economists, architects, planning theorists, and appropriate technologists	Communities of association and of interest, as well as of place	Reducing resource waste; energy efficiency, stressing passive solar heating and cooling; encouraging local food production and reliance on local resources; fostering creation of on-site jobs and neighbourhood stores to revitalize communities and eliminate wasteful commuting
Activists	Writers and community activists who consider themselves bioregionalists, social ecologists, and various other kinds of environmentalists	Human scale, sustainable settlements based on ecological balance, community self-reliance, and participatory democracy	Decentralized, grass roots, cooperative development

(Roseland, 1994, pp. 3-4)

Appendix 2: Model Principles

Model Principles for Sustainable Communities

Principle	Examples of Applying the Principle
1. Recognizes that growth occurs within some limits and is ultimately limited by the carrying capacity of the environment.	<p>Undertake strategic planning facilitated by a team of people who understand this principle</p> <p>Promote education and awareness projects on this principle</p>
2. Values cultural diversity	<p>Prepare a clearly stated policy on this principle</p> <p>Undertake education promoting the value of cultural diversity, especially with respect to the wealth of knowledge that can result from openness and sharing</p>
3. Respects other life forms and supports biodiversity	<p>Ensure that the principle is clearly evident in the policies and practices of the organization</p> <p>Undertake widespread education on the nature of natural habitats</p> <p>Establish and support tougher environmental assessment criteria and decision-making processes</p> <p>Remediate impaired habitats</p>
4. Has shared values amongst the members of the community (promoted through sustainability education)	<p>Encourage all levels of government to recognize that our greatest challenge is to achieve communities that are sustainable if we want to live on a healthy (rather than endangered) planet</p> <p>Encourage us as individuals to re-orient our lives, laws and budgets to support the change from the status quo to a more sustainable future</p> <p>Seek agreement that the media not be used to propagate the images and culture of violence, and rather that it be used in a significant way to promote the culture of sustainability in all its complexity and fascination</p>

<p>5. Employs ecological decision making manager (or equivalent)</p>	<p>Use a vision and/or mission statement</p> <p>Establish a staff position of environment</p> <p>Incorporate the principles of sustainability and intent of a mission statement that supports this approach into all relevant policy statements and manuals.</p> <p>Help fund local multi-sectoral initiatives to provide an advisory and “watchdog” function</p>
<p>6. Makes decisions and plans for the future in a balanced, open and flexible manner that allows the decisions and plans to be informed by perspectives from the social, health, economic and environmental sectors of the community</p>	<p>Hold community or town hall meetings</p> <p>Invite citizen groups to meet with council and its committees on appropriate issues</p> <p>Use plebiscites to decide issues concerning the entire community</p>
<p>7. Makes best use of local efforts and resources (strives for local self-sufficiency and nurtures solutions at the local level)</p>	<p>Develop policies which promote this principle</p> <p>Undertake an inventory of resources</p> <p>Promote conservation, undertake demand-side management, develop laws governing protection of resources from harmful exploitation or impacts</p>
<p>8. Uses renewable and reliable sources of energy</p>	<p>Undertake widespread education and awareness campaigns to reduce peak demands and lower base demands through conservation strategies</p> <p>Develop local markets for alternative energy sources</p> <p>Develop policies, procedures and practices that reflect the principle (e.g., 3Rs policies, closed loop systems for water, heat recovery, demand side management [DSM] policies, services and technologies)</p>
<p>9. Minimizes harm to the natural environment</p>	<p>Develop Official Plans and Master Plans that embody this principle</p> <p>Apply this principle (or zero discharge) wherever possible</p> <p>Develop laws, policies and practices that prevent harm to the environment and laws that punish offenders</p> <p>Form neighborhood or block “greening” organizations</p>

<p>10. Fosters activities which use material in continuous cycles</p>	<p>Prominently display the mission statement of the organization</p> <p>Undertake 3Rs education programs</p> <p>Develop laws, regulations and policies in support of the principle and provide sufficient enforcement</p>
<p>11. Does not compromise the sustainability of other communities (a geographic perspective)</p>	<p>Emphasize basic literacy and education and elimination of poverty (in support decreased population growth)</p> <p>Undertake planning on a watershed basis</p> <p>Promote regional, single-tier governments based on watershed boundaries</p> <p>Plan as though your community lived downstream or downwind with regard to negative impacts</p>

(SCRIP, 1997, pp. 3-5)

Appendix 3: President's Council

December 23, 1996 Release by:

ROBERT E. BREAZEALE

Acting Director

Cooperative Forestry

Forest Service, USDA

Concerning:

President's Council on Sustainable Development

Mission

The President's Council on Sustainable Development was established in June, 1993 by President Clinton. The 25-member Council consists of leaders from industry, government, and nongovernmental organizations concerned with the environment and social equity. The Council's mission was to develop bold, new approaches to integrate economic and environmental policies in ways that meet the needs of the present without compromising the ability of future generations to meet their own needs. Specifically, the Council was to:

- develop and recommend to the President a national sustainable development action strategy that will foster economic vitality, environmental health, and social equity;
- develop a Presidential Awards Program recognizing outstanding achievements in sustainable development; and
- raise public awareness of sustainable development issues and public participation in opportunities for sustainable development.

Phase I -- Recommendations

Pursuant to its mission, the Council established eight task forces focusing on: Eco-Efficiency*; Energy and Transportation; Natural Resources; Principles, Goals, and Definitions; Population and Consumption*; Public Linkage, Dialogue, and Education; Sustainable Agriculture*; and Sustainable Communities. The Council and its task forces met for two years, hearing from people across the country, as it formulated its recommendations. The results of that effort are contained in the report, *Sustainable America: A New Consensus for Prosperity, Opportunity, and a Healthy Environment for the Future*.

Phase II -- Implementation

Upon receipt of the report in March 1996, President Clinton asked the Council to continue its work in order to begin implementing its recommendations. This implementation phase is currently underway. Its objectives are to:

- launch a few Council-initiated projects that implement recommendations made in *Sustainable America*;

- highlight ongoing activities in the U.S. and internationally that are consistent with the Council's recommendations;
- “get the word out” about Sustainable America to business, non-governmental organizations, all levels of government, and America's communities; and
- report on the status of implementation and recommend next steps.

*Task force report available.

Implementation of the Council's recommendations is being handled by three new task forces:

Innovative Local/State/Regional Approaches--deals with recommendations pertaining to biodiversity conservation, natural resources information, ecosystem integrity, incentives for stewardship, community-driven strategic planning, collaborative regional planning, environmental economic development, community growth management, restoration of fisheries, and community design. Also working on four initiatives:

1) Joint Center on Sustainable Communities, 2) Pacific Northwest Regional Council, 3) Metropolitan Strategies, and 4) Eco-Industrial Parks (with National Task Force).

New National Opportunities--deals with recommendations pertaining to increased cost effectiveness of existing regulatory system, alternative performance-based regulatory system, extended product responsibility, fiscal and subsidy reform, and better science for improved decision making. Working on three initiatives: 1) Extended Product Responsibility, 2) Lessons learned from collaborative processes, and 3) Eco-Industrial Parks (with Local Task Force).

International Leadership--deals with recommendations pertaining to international leadership. Working on two initiatives: 1) Contact with other National Councils and international entities on sustainable development and 2) Participating in planning for Rio + 5, U.N. Council on Sustainable Development meetings, and other international meetings.

Finally, Federal working groups have been formed to:

- create draft indicators of the progress of the U.S. in moving toward sustainable development;
- increase collaboration between agencies on information about the materials and energy used in the U.S.;
- promote and coordinate education for sustainability across the Federal government and help implement recommendations pertaining to education; and
- review the policies and programs of Federal agencies and identify practices that are consistent with the Council's definition of sustainability.

Schedule

The Council is currently scheduled to work through December 1996, with meetings in October and December and submission of its final report to the President in mid-December.

Additional Information

For more information about the Council, its members, and its work, please visit the web site at www.whitehouse.gov/PCSD or call (202) 408-5296.

To order free copies of Sustainable America or task force reports, call 1-800-363-3732 or send your request via e-mail to DOE.EREC@NCIINC.COM.

UNITED STATES DEPARTMENT OF AGRICULTURE
Office of the Secretary
Washington, D.C. 20250

September 13, 1996

SECRETARY'S MEMORANDUM 9500-6

SUSTAINABLE DEVELOPMENT

1 PURPOSE

The purpose of this memorandum is to state the Department's support for policies, programs, activities and education in sustainable development, including sustainable agriculture, sustainable forestry, and sustainable rural community development, and to establish a mechanism to coordinate these efforts across the Department.

2 BACKGROUND

The 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro focused on the sustainability of the world's natural resources and highlighted the need to link and balance environmental stewardship, economic development, and community vitality. Throughout the world, there are many instances where human wrought pressures have resulted in environmental degradation through processes such as soil erosion and surface and ground water contamination. Compounding this situation, about 90 million people are added to the global population every year-- mostly in developing countries with the U.S. population increasing by 3 million each year. Within the next 40 years, the world's population is anticipated to reach 9 billion.

Domestically, as population increases and knowledge and technology continue to change agriculture and natural resources, the interrelationships among people, the economy and the land grow increasingly vital. These connections highlight the need to find a lasting balance between the economic, environmental and social components of the USDA mission. This need for balance underlies the central challenge of sustainability. Meeting this challenge is essential if USDA is to be a successful partner in sustaining the people and productivity associated with U.S. agriculture and natural resources.

In 1993, the President's Council on Sustainable Development (PCSD) began working to craft a national sustainability strategy for the United States. The definition of sustainable development in the report of the 1987 United Nation's World Commission on Environment and Development ("Our Common Future," commonly called the Brundtland Report) was adopted as the starting point: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The March 1996 PCSD report, "Sustainable America New Consensus for Prosperity, Opportunity, and a Healthy Environment for the Future," includes recommendations for USDA to enhance its role, individually and in partnership with others, in sustaining the productivity and quality of agricultural and natural resource goods and services, the

natural resource base and ecological systems, and the economic and social vitality of rural communities.

In addition, a Sustainable Agriculture Working Group, established in August 1995 to identify barriers and opportunities in USDA to achieving sustainable agriculture, recommend a USDA-wide statement of commitment to sustainability concepts and establishment of a coordinating mechanism, such as a council, to facilitate implementation of USDA efforts in sustainable development.

3 POLICY

USDA is committed to working toward the economic, environmental, and social sustainability of diverse food, fiber, agriculture, forest, and range systems. USDA will balance goals of improved production and profitability, stewardship of the natural resource base and ecological systems, and enhancement of the vitality of rural communities. USDA will integrate these goals into its policies and programs, particularly through interagency collaboration, partnerships and outreach.

ACTIONS ORDERED

a. Director of Sustainable Development

The position of Director of Sustainable Development is hereby established in the Office of the Chief Economist. The Director will report to the Chief Economist and will lead and coordinate cross-mission area work in sustainable development and represent the Department in both domestic and international arenas on issues relating to sustainable development.

b. USDA Council on Sustainable Development

There is hereby established within the Department a USDA Council on Sustainable Development. The Council will be chaired by the Director of Sustainable Development. The Under Secretaries for Farm and Foreign Agricultural services; Natural Resources and Environment; Research, Education, and Economics; Food, Nutrition and Consumer Services; and Rural Development, and the Assistant Secretaries for Marketing and Regulatory Programs, and Administration shall each appoint one member to serve on the Council. In addition, Administrators of the Agricultural Research Service, Agricultural Marketing Service, Cooperative State Research, Education and Extension Service, Economic Research Service, Farm Service Agency, Rural Business-Cooperative Service, Rural Housing Service, Rural Utilities Service, Director of the National Agricultural Library; and the Chiefs of the Forest Service and the Natural Resources Conservation Service, shall also each appoint a member to serve on the Council. Other agencies, as interested and appropriate, can also serve on the Council. The Council will meet at least four times each year, at the call of the Chair.

The Council will be the forum for policy and program development, implementation, and evaluation on issues relating to sustainable development, and will provide the framework and mechanism needed for integration across mission areas and program activities, such as research, management, technical assistance, education, and grant and loan delivery.

c. Responsibilities of USDA Officials

The philosophy, concepts and principles of sustainable development, involving the balancing of environmental quality, economic development, and the vitality of rural communities, shall be incorporated, as appropriate, into all appropriate Department regulations, policies, and programs, including strategic planning documents, work plans, and performance appraisals. Each agency head shall implement the programs for which the agency head is responsible in ways that are consistent with this policy on sustainable development. Activities involving more than one agency shall be coordinated through the USDA Council on Sustainable Development and the Department's Director of Sustainable Development.

5 EFFECTIVE DATE

The provisions of this Memorandum are effective immediately.

6 TERMINATION

This Memorandum shall remain in effect until the actions ordered herein have been fully implemented, and reviewed each year progress on the actions ordered.

/s/Dan Glickman
DAN GLICKMAN
Secretary

The following paragraphs may be useful in providing context for the scheduled mailing of documentation relating to sustainability and its recent reinforcement:

The Secretary recently issued the enclosed, Secretary's Memorandum 9500-6, on sustainable development to all USDA Agencies. The memorandum provides recognition and reinforcement of the scope and importance of the Department's fundamental goal, which is sustainability. Specifically, all USDA agencies have been directed to include the concepts and principles of sustainable development "into all appropriate Department regulations, policies, and programs, including strategic planning documents, work plans, and performance appraisals."

This memorandum reinforces the relationships between sustainable forestry, sustainable agriculture and sustainable development. It echoes our commitment to think broadly and work collaboratively across Deputy Areas and ownerships. Please share this with your staffs and line officers. Use it as an opportunity to discuss sustainability and its linkage with the mission of the Forest Service as stated in the Course to the Future and the RPA.

The subject of sustainable development has become the focus of increasing attention. There is a growing number of recently released documents relaying its details and importance.

The strongest endorsement is contained in Secretary Glickman's Memorandum 9500-6 on "SUSTAINABLE DEVELOPMENT". This document provides the entire Department, including the Forest Service, with recognition and reinforcement of the scope and importance of USDA's fundamental goal--sustainability.

The most comprehensive endorsement is contained in the report of the President's Council on Sustainable Development entitled "Sustainable America". This document provides overarching information and the lead for eight task force reports, each focusing on an individual element of sustainability.

State and Private Forestry partnerships with State Forestry Agencies are particularly well positioned to respond to the Secretary's charge to implement the concepts and principles of sustainable development. Our joint history in balancing environmental quality, economic development and the vitality of communities" is a model for coordination. At the same time however, these document's references to sustainable forestry, agriculture, and rural development invites us all the think even more broadly and collaborate even more aggressively in cross-discipline partnerships.

As we well know, no one single department or agency has the knowledge, skills, or resources to address this challenge. This emphasis provides an excellent opportunity to work with and through our partners, eg, NASF committees, etc, in efforts to more effectively coordinate and collaborate our activities addressing sustainable development.

Appendix 4: Indicators of Sustainability

(found at <http://subjectmatters.com/indicators/WhatIsAnIndicator.html>)

What Is an Indicator of Sustainability?

An indicator is something that helps you understand where you are, which way you are going and how far you are from where you want to be. A good indicator alerts you to a problem before it gets too bad and helps you recognize what needs to be done to fix the problem. Indicators of a sustainable community point to areas where the links between the economy, environment and society are weak. They allow you to see where the problem areas are and help show the way to fix those problems.

Indicators of sustainability are not the traditional indicators of economic success and environmental quality. Because sustainability requires a more integrated view of the world, the indicators should link the economy, environment, and society of the community. An economic indicator that does not include environmental or social effects will not help move in a sustainable direction. Likewise, an environmental indicator that does not take into account economic or social impacts will not provide adequate insight into the best way to improve a community's health and vitality.

Traditional indicators of community well-being tend to look at one part of a community. For example, the Gross National Product (GNP) measures a country's imports and exports. It is used to show the health of a country's economy. However, because GNP does not link economic health with the social and environmental health of the community, it can point in the wrong direction for improving overall community health. When the Exxon Valdez tanker ran aground, the spilled oil killed millions of animals and cost millions of dollars to clean up. The jobs created from clean up activities made the United States' GNP go up.

Using the GNP as an indicator suggests that we should get more oil tankers to run into rocks more often. The GNP is a one-dimensional indicator which measures the health of the economy at the expense of the environment and the society.

...trying to run a complex society on a single indicator like the Gross National Product is literally like trying to fly a 747 with only one gauge on the instrument panel...imagine if your doctor, when giving you a checkup, did no more than check your blood pressure.

- Hazel Henderson, Paradigms of Progress

Table 1 compares other traditional indicators with sustainable community indicators:

Traditional vs. sustainable economic indicators

- Traditional vs. sustainable environmental indicators
- Traditional vs. sustainable social indicators

Indicators of sustainable community are useful to different communities for different reasons. For a healthy, vibrant community, indicators help monitor that health so that negative trends are caught and dealt with before they become a problem. For communities with economic, social, or

environmental problems, indicators can point the way to a better future. For all communities, indicators can generate discussion among people with different backgrounds and viewpoints, and, in the process, help create a shared vision of what the community should be.

Copyright © 1996 Maureen Hart. All rights reserved.

(found at <http://subjectmatters.com/indicators/EffectiveIndicators.html>)

Characteristics of Effective Indicators

An indicator is something that points to a problem or condition. Its purpose is to show you how well a system is working. If there is a problem, an indicator can help you determine what direction to take to solve the problem. Indicators are as varied as the types of systems they monitor. However, there are certain characteristics that effective indicators have in common:

- Relevant to sustainability
- Understandable to the community at large
- Developed and accepted by the people in the community
- Link economy, society, and environment
- Focus on long range view
- Advance local sustainability, but not at the expense of others
- Based on reliable information
- Based on timely information

An example of an indicator is the gas gauge in your car. The gas gauge shows you how much gasoline is left in your car. If the gauge shows the tank is almost empty, you know it's time to fill up. Another example of an indicator is a midterm report card. It shows you whether a student is doing well enough to go to the next grade or if extra help is needed. Both of these indicators provide information to help prevent or solve problems, hopefully before they become too severe.

Relevant to Sustainability

An indicator must be relevant, that is, it must fit the purpose for measuring. As indicators, the gas gauge and the report card both measure facts that are very relevant. If, instead of measuring the amount of gas in the tank, the gas gauge showed the octane rating of the gasoline, it would not help you decide when to refill the tank. Likewise, a report card that measured the number of pencils used by the student would be a poor indicator of academic performance.

Understandable to the Community at Large

An indicator must be understandable. You need to know what it is telling you. There are many different types of gas gauges. Some gauges have a lever that moves between “full” and “empty” marks. Other gauges use lights to achieve the same effect. Some gauges show the number of gallons of gasoline left in the tank. Although different, each gauge is understandable to the driver. Similarly, with the report card, different schools have different ways of reporting academic progress. Some schools have letter grades A through F. Other schools use numbers from 100 to 0. Still other

schools use written comments. Like the gas gauge, these different measures all express the student's progress or lack of progress in a way that is understandable to the person reading the report card.

On the other hand, a gas gauge that showed the number of BTU's left in the tank would probably not be very useful to you in deciding when to fill up the tank. Likewise, a report card that gave grades in ancient Greek script would be a mystery to most people. In order for you to know when action is needed, you must be able to understand what an indicator is telling you.

Indicators should be understandable to members of the community. Sustainability is not an academic concept that only scientists talk about. Sustainability is about people living in communities. It is the people who will make sustainable communities happen, so they need to understand the indicators. A complex indicator of the economy that is understandable only to an economist will not help the community make intelligent decisions. Likewise, a complicated chemical description of water quality, although understandable to the environmental scientist, will not help ordinary people decide how to make a river fishable. Indicators need to be understood by the general community, not just by highly trained specialists.

Developed and Accepted by the People in the Community

Indicators of sustainable community need to be selected by the community. This requires community-wide education and discussion about what sustainability means, particularly in the context of the community itself. The discussion can use existing definitions of sustainability to help keep the discussion on track but the final definition and indicators need to be agreed on by members of the local community.

Link Economy, Society, and Environment

Indicators need to show the link between the economic, social, and environmental parts of the community. A sustainable community is one where the interweaving of economy, society, and environment serves to strengthen its overall fabric. Indicators should point out these links whenever possible. Indicators that measure progress in only one of these parts of a community are not good measures of sustainability. Median income, a frequently used economic indicator, is an example of a one-dimensional measure of a community. The median income of a community is the income level at which there are as many people with incomes below an amount as there are above that amount.

Although median income is a common measure of economic well-being, it is a poor indicator of a sustainable community because it does not link the economic part of the community with the social or environmental parts of that community. A better measure of a sustainable community would make a link between the economic sphere and the social or environmental. For example, one measure would be the percent of the median income needed to pay for the basic needs of a person living in the community. This links the economic with the social sphere.

Indicators need to acknowledge and improve the links between the three essential parts of a community: economy, environment and society. Members of a sustainable community realize that long term economic security depends upon having a sound, functioning ecosystem and a healthy social environment. An indicator that measures changes in just one of these spheres without tying the changes to at least one of the other spheres will be more apt to lead ultimately to unsustainability.

Focus on Long Range View

Indicators should take a long range view of the community. Because sustainability is defined as long term community health, the indicators that measure progress must also take a long term view. For example, an indicator that measures the number of building permits issued, although a measure of the current health of the construction and real estate industries, is not a good measure of sustainability. Over the long term, an indicator that measures the number of permits and not the effect or quality of the construction is going to lead to unsustainability. An indicator that allows for different types of construction, or looks at the amount of construction that uses existing structures or new buildings on old sites would be a better indicator.

Sustainability is not a quick fix for current problems. It is a way of choosing actions today that will not cause problems tomorrow. The pesticide DDT seemed like a good solution at the time, but the long term results have been devastating. Chlorinated hydrocarbons were an easy way to clean industrial parts but now that they have been banned, it could still take a hundred years for the depleted ozone layer to recover. Building a new shopping mall may initially boost the economy by providing construction jobs, but if the net result is that existing retail stores are put out of business, the initial increase in jobs may end up being a net loss five years down the road. There are times when short term fixes are needed. But short term indicators should not be used for measuring long term sustainability.

Advance Local Sustainability, But Not at the Expense of Others

Sustainable community indicators should not measure local sustainability at the expense of a distant or more global community. Again, using the example of median income, an indicator that uses median income with a goal of 120% of the US median income, sets one community against all other communities, since for one community to be at 120% of the US median income, there must be another community that is at only 80% of the US median income.

Based on Reliable Information

An indicator must be reliable. You must trust what the indicator shows. A good gas gauge and report card give information that can be relied on. A gas gauge that shows the tank is empty when in fact it is half full would make you stop for gasoline before it is needed. A gas gauge that shows the tank is half full when in fact it is empty would cause you to run out of gas in an inconvenient place. Similarly, if a student's grade is reported wrong, an honors student could be sent for remedial work

and the student that needs help would not get it. An indicator is only useful if you know you can believe what it is showing you.

Reliability is not the same as precision. When your gas gauge registers empty, you know there is still a gallon or so of gasoline left as a reserve. The gas gauge reliably under-reports the amount of gasoline. An indicator does not necessarily need to be precise; it just needs to give a reliable picture of the system it is measuring.

Based on Timely Information

Indicators must provide timely information. They must give you information while there is time to act. For example, imagine a gas gauge that only gave you the amount of gasoline in the tank when the engine was started. After you have been driving for several hours, that reading is no longer useful. You need to know how much gasoline is in the tank at each moment. Similarly, a report card distributed a week before graduation arrives too late to give a student remedial help. In order for an indicator to be useful in preventing or solving a problem, it must give you the information when there is still time to correct the problem.

Copyright © 1996 Maureen Hart. All rights reserved.

(found at <http://www.subjectmatters.com/indicators/IndicatorsHow.html>)

Developing Effective Indicators

Finding indicators that meet all the criteria for effectiveness can be extremely difficult. As a result, although it is important to aim for the best when developing indicators, it is also important to not be discouraged by the seeming impossibility of it all. None of the criteria are absolute, and at times a less desirable indicator may be selected when there are no reliable data sources for a better indicator. However, it is important to remember that sustainability is a long term concept. Its indicators are not just a statement of what exists, they show the community's vision of the future. Before time is spent gathering and reporting data for an indicator, it should be compared to the community's definition of sustainability to make sure that it is measuring the right thing.

Because sustainability requires a vision of what could be, not what is, data may not be readily available for many of the good indicators. In addition, some indicators may not have adequate definition. This has led many communities to choose traditional data sources and measures for indicators. The advantage of many traditional indicators is that the data is readily available and can be used to compare communities. Using traditional measures can be worthwhile in the short term while other data sources are explored or developed. Traditional indicators can also help to define problem areas. However, there is a real danger that the traditional data sources and traditional indicators will focus attention on the traditional solutions that created an unsustainable community in the first place.

There is a better way to find good indicators of sustainability: Come up with the best indicators for the community and then decide later where and how to get the necessary information. Discussions that include the phrase “but you can't get that information anywhere” are not going to lead to indicators of sustainability. In fact, if you define a list of indicators and find that the data is readily available for every one of them, you have not thought hard enough about sustainability. Try to define the best indicators and only settle for less as an interim step while developing data sources for the better indicators.

Now that you know what sustainable indicators look like, how many do you need? The answer is: how many do you want? The number of indicators that a community selects is entirely up to the community and depends on a number of factors, including: the size of the community, the number of critical issues, and the resources available to track and report on the indicators. The final list should not be so short that critical problems or areas are overlooked. It should also not be so long that measuring and reporting them is an overwhelming task. What is more important than the number of indicators selected is the mix of indicators: the areas or categories which are covered by the indicators.

Do you absolutely need indicators? No, in all honestly, you don't need to have indicators of sustainability, just as you don't need to have indicators of economic well-being. Most people know whether they are economically well-off or whether they are having a hard time making ends meet. Most people also have a good idea, once they understand the meaning of sustainability, whether or not they are living a sustainable lifestyle. However, indicators are useful in judging if you are making progress towards a goal. It is one thing to feel like money is tight. It's another to actually measure and compare your income and expenses and be able to plan changes so you can feed and clothe your family now and still save for retirement. Sustainability indicators help show if the life we are living now can be supported 10, 20 or 50 years from now.

Copyright © 1996 Maureen Hart. All rights reserved.

(found at <http://subjectmatters.com/indicators/IndicatorChecklist.html>)

A Checklist for Evaluating Indicators

An indicator is a lot like a compass: it points out a direction in which to move. But, just like a compass, it's important that an indicator be properly calibrated--that it really be pointing in the right direction. If not, it can lead you somewhere you had no intention of going. The checklist below is a way to calibrate sustainable community indicators based on a set of characteristics that all good indicators share.

The checklist works best when it is used by the community itself, since the members of the community are the ones who have to understand and use the indicators. There are ten questions to ask about every indicator. Each positive answer earns points. Some questions are more important than others and so result in more points. Partial credit is not only allowed, it's encouraged! The total possible score for an indicator is 20 points; however, the actual score is not as important as the

potential score because the checklist is designed to take a long term view of indicators. Indicators, like fine wine, should improve with age.

The most important question on the checklist is the last question. It does not have any points because it's the "show stopper" question. Does the indicator focus on local sustainability at the expense of global sustainability? Any indicator that says "we are going to be better off by making someone else worse off" is automatically disqualified. This does not mean that one community can not be better than another community. There will always be communities that succeed while others fail. It just means that it is not acceptable for a community to succeed at the expense of another community.

Here is the checklist:

Sustainable Community Indicator Checklist	
Maximum Points	Indicator Characteristic
2	<p>Is the indicator relevant to the community's definition of sustainability?</p> <p>Sustainability in a urban or suburban area can be quite different from sustainability in a rural town. How well does the direction the indicator is pointing match the community's vision of sustainability?</p>
2	<p>Is the indicator understandable to the community at large?</p> <p>If it is only understood only by experts, it will only be used by experts.</p>
3	<p>Is the indicator developed, accepted, and used by the community?</p> <p>How much do people really think about the indicator? We all know how much money we make every year. How many people really know how much water they use in a day?</p>
3	<p>Does the indicator provide a long term view of the community?</p> <p>Is there information about where the community has been as well as a goal set for where the community should be in 20, 30 or 50 years?</p>
6	<p>Does the indicator link the different areas of the community?</p> <p>The areas to link are: culture/social, economy, education, environment, health, housing, quality of life, politics, population, public safety, recreation, resource consumption/use, and transportation (the more links, the more points up to six).</p>
1	Is the indicator based on information that is reliable?
1	Is the indicator based on information that is accessible?
1	Is the indicator based on information that is timely?
1	Is the indicator based on information that is accurate?
X	<p>Does the indicator focus on local sustainability that is at the expense of global sustainability?</p> <p>If the answer to this question is “yes,” then the indicator is automatically disqualified.</p>

Copyright © 1996 Maureen Hart. All rights reserved.
 (found at <http://subjectmatters.com/indicators/IndicatorsSources.html>)

Data Sources for Indicators

Data for indicators can be found in a wide variety of places, including local government agencies, state government agencies, academic institutions, large government databases, and reports at your local library. In most cases, the more local the source of data, the more relevant it will be to your community. Finding the data sources is a matter of talking to different people. If you have succeeded in having a diverse cross section of the community represented in your project, locating data sources will be easier because of the expertise of the people working on the project. Everyone will know at least one potential source of information, some people will know many.

Local Sources of Data

Local agencies are a valuable source of local information. The town, city or county clerk generally has information about population and voting. The clerk's office may also have information about local motor vehicle registration and housing. The department of public works has information on water use, the generation of solid waste and waste water, and recycling rates. Public health departments can provide information on illness and disease. Local school boards or superintendent offices can provide information on school graduation rates, free lunch programs and other education related issues. The town finance department will have information on tax revenue, tax rates, and government expenditures. The local welfare office may be able to provide information related to food and housing subsidies. These information sources will be the most relevant to local indicators of sustainable community.

Local organizations or local branches of national organizations are also good sources of information. In some cases these organizations may have conducted surveys or researched specific issues within the community. In other cases, local organizations may have the support of a national parent organization that can provide information. For example, the local League of Women of Voters may have done a survey on citizen participation rates. The local Audubon Society chapter may have organized a survey of local bird species. Local chambers of commerce may have information on shopping habits or local businesses. The local United Way or another charitable organization may have done an assessment of the community's need for health care and other services. Each of these information sources provides community specific data that could be useful for local indicators.

Local colleges and universities are a valuable source of information on a wide variety of issues and in many different forms. Frequently there are professors and researchers at these institutions who have experience in areas ranging from economics to environment to health and social services. Often the schools have related institutions which publish reports and do surveys on community related issues. These can provide information about the community and a point of comparison to other similar communities.

Your local library is also an important source of information in three ways: First, many libraries have copies of U.S. Census reports and similar national or regional reports. Getting federal data may be as easy as asking your reference librarian. Second, in addition to having copies of reports from national groups, local libraries often have copies of reports researched and written locally that are specific to your community. Third, local libraries are helpful in locating additional sources of information. Most reference librarians can provide suggestions for where to find additional sources of information and frequently may even be able to get copies for you.

State and National Sources of Data

Although they probably will not be useful as a primary source of data for local community indicators, there are also regional and national sources of information. These will be particularly useful in the beginning stages of a project. These sources of data show general information and trends over time that can be used to interest people in the process. The types of information include changes in population, changes in employment and changes in housing.

Regional and state agencies can provide information on a variety of issues. Most states have a planning board or a planning commission whose job it is to keep track of information about activities in the state and project how those activities may change over time. For example, the planning board may have yearly population projections for towns and cities in the state. The board may also have information about traffic patterns and expected changes in those patterns. Environmental agencies at the state and national level can provide information about air and water quality.

We have compiled a list of data sources that have been used by some of the existing sustainability projects for specific categories of indicators. This list is provided to help you think of other possible data sources, not to limit the places you go for information or to limit the type of information that your community chooses to use for monitoring its progress. The best indicators are those that fit your community and link the community's economic, environmental and social well-being.

**DEFINING SUSTAINABLE COMMUNITIES:
DISCUSSION OF A PAPER BY DONALD E. VOTH AND ZOLA K. MOON**

**David L. Debertin
Ag Economics Department
University of Kentucky**

Voth and Moon have provided us with an excellent paper which outlines some of the problems academicians face in dealing with sustainability issues. These difficulties include not only those associated with operationalizing the concept of community sustainability, but also the discussions with respect to the basics of how a sustainable rural community should be defined. Even more basic questions are what a (rural) community--sustainable or not--really is, and how a community might develop a strategic plan to ensure sustainability (Walzer and Deller).

Voth and Moon seem troubled by differences in the literature with respect to how the phrase "sustainable community" is interpreted and applied. The concern and confusion over the definition of the term "sustainable" is nothing new to the faculty members in colleges of agriculture who have been a part of the discussions on defining sustainability in an agricultural setting.¹ In addition, the term "community" can have a number of different definitions.² Certainly, when two words that each have several definitions are paired, the possibilities for disagreement with respect to meaning and interpretation of the paired terms increases.

In reading this paper, I am especially reminded of the lengthy debates that occurred when the concept of sustainable agriculture first entered the mainstream of thought within academicians and administrators of colleges of agriculture. I want to focus a number of my comments on how colleges of agriculture might work within a "sustainable community" paradigm, but in order to do this I need to take a moment to review the process by which colleges of agriculture have come to embrace the paradigm embodied within the sustainable agriculture movement. Let me apologize for initially drifting somewhat from the content of the Voth-Moon paper.

Colleges of agriculture within land grant universities and the various public and private agencies that have been responsible for fostering the growth of the publicly-supported research and educational system, initially saw "sustainable agriculture" as a potential threat to the technology discovery-and-dissemination system that had been built up in the post-World War II era.

Many of these, the researchers, educators and administrators, within colleges of agriculture, believed that the one of the great strengths of the research and educational system was the ability to gradually move farmers away from a "farming as a way of life" paradigm and toward a "farming as a profitable business" paradigm--and that somehow these two paradigms could not comfortably co-exist. Then in the 70s and 80s the technical agriculture community was confronted with criticisms from individuals such as writers Jim Hightower and Wendell Berry who argued that the "scientific agriculture" paradigm had been pushed too far, even as the concerns (which really began in the early 1960s with the publication of Rachel Carson's book) over the environmental consequences of chemicals on the environment increasingly gained widespread public acceptance. Voth and Moon

are also correct in noting that the sustainable agriculture movement really moved forward after the farm financial crisis in the early 80s--an experience that suggested to some that “farming as a profitable business” paradigm may not be the ideal one.

Meanwhile, the base of political support from those farmers who had benefitted from the technology-transfer model strengthened (as did colleges of agriculture’s abilities to create these technologies and get them adopted). Many of the farmers who primarily benefitted from this technology-transfer model joined to support a position that somehow the sustainable agriculture agenda represented a threat to both farm profitability and the ability of farmers to produce the nation’s food supply. “Farming as a way of life” embodying a concern for the environment, the preservation of land and even a lifestyle with an emphasis on the continued use of the land by future generations that seemed inherent in sustainability somehow threatened a “profitable, scientifically-based agriculture.”

But in the past few years, these conflicts seem to be getting resolved, at least to a large degree. Agricultural administrators (scientists too) now routinely use the terminology “sustainable agriculture” and often now are seeking to build reputations for colleges of agriculture as “centers of origin” for the development of “technologies consistent with the goals of sustainable agriculture” just as they had for technologies developed in the past. Colleges of agriculture once treated those who were concerned about food safety in modern production and processing technologies and those who advocated production technologies which reduced or eliminated the use of chemicals as part of a non-science (perhaps lunatic) fringe who posed a threat to the traditional research- and technology-transfer model which had served commercial agriculture so well in the past. Now many of these same agricultural scientists seem to be embracing these consumer concerns as part of an agenda that could lead to increased funding and support for research and educational programs.

Still, some within colleges of agriculture (and commercial farmers) see consumer interest in the production technologies employed as a continued threat to the proven and still politically popular methods of doing things within a profitable and productive agriculture. And most colleges of agriculture are still not ready to move from a paradigm that primarily seeks to “do good by helping farmers further increasing agricultural cash receipts” to an alternative paradigm instead embodying “doing good by seeking to make genuine efforts to improve the well-being of rural residents--whether farm or non-farm--wherever that goal may lead us, and whatever changes are needed in the complement of scientists, educators and others required to attain that goal.”

Most agricultural scientists still employ rather simple measures for evaluating the successes or failure of their work. Success is declared if a researcher is able, say, to increase the per acre yield of a crop while production costs remain constant (or perhaps even decrease), or if the feed intake per pound of gain is reduced for a particular class of livestock. For the extension educator, success is often gauged on the basis of the number and speed by which such technological developments have been adapted by farmers--and colleges of agriculture have historically been “the engine of technology adoption.” These measures can readily be converted to dollars of benefit, justifying more political support for expenditures of research and educational programs at land grant universities.

Colleges of agriculture have usually been very reluctant to press the evaluation of such efforts a step further--that is, to ask the broader (but, for me at least, far more interesting and profound) question (inherent in the concept of a sustainable rural community) as to "have these efforts actually improved the lives of those living in the rural areas affected by these technologies as they are adopted." "If so, in what ways?" Usually this question is answered by arguing that if cash receipts from the sale of agricultural commodities have risen, then the economies of the rural areas in which these increases took place must somehow be better off. But is this necessarily so?

The debates that have taken place and the experiences that colleges of agriculture have undergone in the past decade or two in confronting sustainable agriculture issues, and the evolution in the thought processes considered to be mainstream by agricultural scientists, educators and administrators become the backdrop for what is now happening with respect to defining and operationalizing the concept of a sustainable rural community. Many in colleges of agriculture have traditionally been uneasy with efforts by agricultural scientists and educators aimed at rural development (Should agricultural scientists be "out there" trying to improve the lives of rural people? Is it somehow insufficient simply to make agriculture more productive?). In addition, should the idea of a "sustainable" rural community "somehow" now be linked to what we now "know" about sustainability for our experiences with sustainable agriculture. After all, isn't agriculture, by definition, conducted in "rural" areas and are not farmers also an integral part of rural communities?

Is a sustainable rural community one which is surrounded by farms where the majority of the operators are engaged in production practices consistent with the basic tenets of sustainable agriculture? That is an interesting question--and a view that many within colleges of agriculture would agree with. Certainly there is some overlap--one of the basic goals of sustainable agriculture is production that is obtained employing technologies that are both ecologically sound and environmentally safe. Surely those living in a rural community would not wish anyone, including farmers, to engage in activities that would in any way prove harmful to the environment!

But ultimately, in building an operational definition for a sustainable community, this view, however appealing, strikes me as having a far too narrow focus. The core of an alternative paradigm I would propose addresses the sustainability issue in the context of improving the well-being of all of those who live in a rural community--whether they live on a farm or not. Even more striking is that the concept of a sustainable rural community is at the very heart of what I believe those working within a college of agriculture should see their work as all about--improving the lives of all those who live in rural areas, not just the lives of those able to take full advantage of the latest output-increasing and cost-reducing production technologies developed by agricultural scientists.

This alternative paradigm built around a sustainable communities theme may take some getting used to. The concept of a "sustainable rural community" pushes this idea in directions some of us in the agriculture and educational community may not be fully ready to accept. Multiple dimensions are involved many with primary economic and social components. Some of the components of this new paradigm for a sustainable rural community are:

1. *A strong and growing economic base*

Among those involved with the sustainable agriculture paradigm, it is now generally recognized that the long-run profitability of practices consistent with sustainable agriculture now plays a critical role in determining whether a particular production practice will be implemented or not. Income generated from the economic base must play a similar role in the sustainability of rural communities. A rural community is not sustainable if the economic base is insufficient to provide what is regarded as an adequate standard of living for its residents, just as a particular agricultural production system is not sustainable unless it is profitable in the long run. Not only does the amount of income generated by the various employment opportunities matter.

2. *Fair and equitable distribution of the incomes generated from the economic base*

I am arguing here that if two or more alternative economic base scenarios are possible for a rural community, preference should be given to the choice that leads to the more equitable distribution of incomes among the rural residents. This suggests that a scenario involving industrial development that creates a significant number of high-wage jobs should be favored over one that creates primarily low-wage jobs, while leaving a chosen few managers and owners to reap most of the economic gains of the business. This argument further implies that some of the strategies associated with the new industrialization of agriculture involving low-wage employment in, say livestock processing facilities, may score rather poorly based on this criterion.

Agricultural scientists wary of efforts by agricultural economists and sociologists to get them to think about the social consequences of new technology adoption in agriculture as it affects basic farming characteristics such as the structure of agriculture within a region are likely going to be even more wary of efforts aimed at determining how technology adoption--particularly technology adoption in the rapidly evolving industrialized agriculture--likely affects the distribution of incomes to both farm and non-farm residents of a rural community.

And the technologies we continue to generate and promote--even under the banner of positive rural economic development efforts involving agriculture--have consequences (some favorable, others adverse) on the distribution of incomes within an area. In Kentucky considerable effort has been devoted to the development of strategies designed to replace a potential long-term loss of income from tobacco with increased cash receipts from other enterprises. Many of these strategies involve agricultural production consistent with the so called "new industrialization" of agriculture. Income from the sale of tobacco--often a billion dollars annually--is broadly distributed to a large number of small-scale producers, the majority of which produce only a few thousand pounds of tobacco annually. New industrialization approaches often involve producing a large amount of product--say pork or chicken by only a few large-scale producers, although some of this production is contracted to small operators. Land grant scientists and administrators, however, frequently prefer to judge success based on aggregate value of agricultural production rather than trying to evaluate the income distribution consequences.

But how income is distributed within a rural community can have as much effect or even be of greater consequence on the sustainability of the rural community as the total amount of income that can be distributed. Gauging how a particular strategy might affect the distribution of income within a community as well as the even “softer” quality-of-life measures advocated as important by sociologists (such as those listed at Hart’s web site) pushes this further still. While the total amount of income produced within a community or sub-region may be a factor in evaluating a particular rural development strategy, the distribution of this income among residents may be even more important.

3. *A stable if not increasing population base*

This is critical for a variety of reasons, including the provision for and maintenance of the requisite public (i.e. schools) and quasi-public services (i.e. medical facilities). A town on the Northern Great Plains that lost 20 percent of its population in the last decade and a-half can hardly be called a sustainable rural community.

4. *Agricultural activities in the surrounding rural community are conducted in a manner consistent with the goals of sustainable agriculture.*

In addition to long-run profitability, the sustainable agriculture paradigm embodies production practices and technologies that are environmentally and ecologically sound; concern for preservation of the land for future generations through efforts aimed at soil conservation, reduction of pollutant loads into the ground and surface water, environmentally sound approaches for handling agricultural wastes, and production of agricultural products employing technologies that will assure a safe and healthful product for consumers. These goals are not only consistent with a productive and profitable agriculture, but also with the preservation of farming as a way of life for current and future generations, suggesting that these are not necessarily competing goals.

5. *Rural Industry--whether agriculturally-related or not--engage in production in a manner that is ecologically and environmentally sound.*

Business and industry located in rural areas should be held to high standards with respect to protecting the well-being and the health of rural residents.

6. *The presence of social capital, however defined, within the rural which results in a high quality of life preserving and enhancing the “rural lifestyle.”*

Local residents in such a community see their community as a desirable place in which to live--a place where important shared problems facing the community can be identified and solved through collective action of the residents. Community concerns are addressed in a positive fashion, and there are broad-based efforts directed toward problem-solving involving a high proportion of the residents. Barriers are overcome through shared community efforts.

Concluding Comments

What matters here from the perspective of those involved with agriculture who seek to “do good”? Does it matter most that cash receipts from the sale of agricultural commodities increase, or instead does it matter most that rural communities both large and small survive and prosper (be sustainable) and that this prosperity continues even as the quality of the environment and living conditions for the local residents improve? Increased sales of agricultural commodities may contribute to this broader-based goal, but increasing the output and cash receipts from the sale of agricultural commodities may be only a minor component of the overall strategy--perhaps having negative consequences on the environmental and ecological portions of the sustainable rural community paradigm. To cite the paper (pg 1) “It is the qualities of community life which are worth sustaining, not communities *per se*.” I certainly agree with that statement.

End Notes

¹In a recent document “Production Practices and Systems in Sustainable Agriculture” (available on the internet at <http://www.uky.edu/~deberti/test/sust.htm>) Dr. Angelos Pagoulatos and I outline in great detail some of the difficulties in defining and operationalizing the term sustainable as it applies in an agricultural setting, and the difficulties these definitional issues impose on developing successful strategies for measuring the degree to which individual agricultural production practices are, indeed, sustainable.

²In another internet document “A Comparison of Social Capital in Rural and Urban Settings” (also available on the internet at <http://www.uky.edu/~deberti/socsaea.htm>) I discuss how the definitions of “community” as related to a location in geographic space differs from a community of shared values, interests and concerns. It is not surprising that Voth and Moon are struggling with the various meanings of the term “sustainable community” since there is disagreement among the various authors as to which specific definition of sustainability should be paired with which specific definition of community.

References

Berry, Wendell, *The Unsettling of America: Culture and Agriculture*. 20th Anniversary (3rd) Edition, Sierra Club Books, 1997 (paperback).

Carson, Rachel, *Silent Spring*. Boston, Houghton Mifflin, Riverside Press, 1962, paperback.

Hightower, Jim *Hard Tomatoes Hard Times*. Schenkman Publishing, Cambridge, Mass, 1972 (Agribusiness Accountability Task Force).

Voth, Donald E. and Zola K. Moon *Defining Sustainable Communities* paper presented at the SRIEG “Rural Infrastructure as a Cause and Consequence of Rural Economic Development and Quality of Life” Feb 102, 1997, Birmingham, AL.

Walzer, Norman and Steven Deller. “Rural Issues and Trends: The Role of Strategic Visioning Programs” *Community Strategic Visioning Programs* ed Norman Walzer, Praeger, Westport, Ct., pp. 1-20.

An Introduction to the Community Policy Analysis System, COMPAS

Thomas G. Johnson
James K. Scott
Jian Ma¹

February 1, 1997

INTRODUCTION

Devolution of authority and responsibility from the Federal Government to state and local governments is, and will continue to be, one of the most dominant public policy issue for communities in the last half decade of this century. Block grants, deregulation, welfare reform, health care reform, education reform, agricultural policy reform, various state waivers, and other terms fill the national policy dialogue and all are symptomatic of devolution.

To communities, especially rural communities, devolution spells the end of many of the safety nets that protected local governments, school districts and other public entities from some economic and social hardships. At the same time devolution enhances opportunities for local leadership and increases the returns to aggressive and innovative public decision making. In this environment, the value of economic and social information, accurate projections and analyses of policy alternatives is particularly great. This in turn is creating an opportunity for those involved in the decision support sciences.

The Community Policy Analysis System (COMPAS) is a response to this opportunity. It tries to address the information needs of policy makers at the Federal, state and local levels. At the Federal level, there is a growing need for a better understanding of the local consequences of federal policy, especially policy which devolves responsibility to local governments. Similarly, state governments require information on the consequences of their policies on local governments as both state and local responsibilities change.

The need, under these emerging circumstances, for better decision support at the local level is obvious. The diversity of conditions in rural communities means that generic, or aggregated decision support tools probably conceal more than they reveal. Broad generalizations about policy impacts are usually uninformative at best, misleading at worst. It is clear, for example, that to conclude that trade liberalization will lead to overall increases in income and employment is an important aggregate projection but it tells us little about the changes that will be experienced by individual communities or what their optimum responses to these changes might be.

In response to this need for community level information to support Federal, state and local policy making, an ambitious and innovative approach is called for. This paper describes a proposed and on-going effort to provide some of this information. Being proposed is a national system of community level models based on a standardized accounting system and system of economic and social indicators but a decentralized, bottoms-up approach to model development. It takes into account the data realities at the community level, it attempts to

¹ The authors are respectively, the Frank Miller Professor of Agricultural Economics, Research Assistant Professor, and Research Associate University of Missouri. This paper was prepared for presentation at the 1997 meeting of the Southern Extension and Research Activities - Information Exchange Group (SERA-IEG) 53 meetings in Birmingham Alabama, February 1 - 2, 1997.

incorporates the current conceptual foundations from the social sciences and regional science, it is evolutionary in that it will be designed to be flexible and continually improved upon, and it recognizes and tries to accommodate the institutional and constitutional differences among states and communities.

The model discussed below is based primarily on the authors' experience with the Virginia Impact Project (VIP) model, and Missouri's Show Me Model which have evolved over the last decade. However, these models, are themselves just a recent chapter in a long tradition of community modeling by rural development researchers (see Halstead, Leistritz, and Johnson for a history of just some of these models). The novel aspect of this project is the attempt to create models for communities throughout the nation.

THE ELEMENTS OF A COMMUNITY POLICY ANALYSIS SYSTEM

There are a staggering number of considerations involved in modeling a community for policy analysis. The following assumptions are based on conceptual logic and/or empirical studies of communities. Each are reflected in the proposed community modeling framework.

1. While economic and social relationships know no geopolitical boundaries, policy provisions, public services, taxing authority, and data, do. Therefore, county, municipal, and public service boundaries should be at the basis of any policy model.
2. Communities within states share common constitutional limitations and responsibilities, and have developed comparable institutions.
3. Communities with similar economic bases have similar economic structures. Because of the importance of climatic, geographic, social and political influences, economic bases are frequently quite homogeneous across geographic regions.
4. Communities of similar size and with similar geographic relationships to nearby larger and smaller communities, perform similar central place roles and are likely to exhibit similar responses to economic (and policy) stimuli.
5. The fundamental engine for economic growth, decline, and change at the local level is employment. Community impacts are effected through the labor market which allocates jobs between the currently unemployed, residents of nearby communities (incommuters), current residents who work outside the community (outcommuters), and new entrants to the local labor market.
6. Changes in employment, unemployment, commuting, labor force, population, school enrollment and income, lead to changes in housing needs, property tax base, public service demands, and transfers to households and local governments.

These principles guided the estimation and development of the Virginia Impact Projection (VIP) model and the Show Me model for Missouri communities. Both models are systems of cross-sectional econometrically estimated equations estimated for rural communities and cities in the respective states.

Experience with the estimation of these models indicates that with careful selection of variables and functional form, stable coefficients can be estimated for communities with a wide variety of sizes and economic bases. Basic institutional differences cannot be captured with a

single set of parameter estimates, however. Furthermore, attempts to apply the model to other states have underscored the importance of differences in the structure of public service provision. Therefore, only states with very similar local government structures will be candidate for grouping together.

HOW THESE MODELS WORK

While many different model structures could generate comparable policy analyses, it is proposed that the COMPAS models share a basic structure.

The COMPAS models will be based on the assumptions above as well as others about the way in which rural and small city economies work, about the way in which local governments make decisions, and about the conditions under which local public services are provided. In the following pages, the first and most simple of the COMPAS models will be described.

Labor Market Equations

The labor market concept plays a central role in the COMPAS models. The models are built on the assumption that economic growth is caused largely by exogenous increases in employment. This is not to say that employment at the community level is not responsive to local conditions but rather, that these responses will be dealt with as direct changes or shocks to be introduced to the models. In this simple model, demand can be viewed as perfectly inelastic at the exogenous level of employment. Total labor supply is perfectly elastic at the prevailing regional or national wage level (adjusted for local cost of living, amenities, etc.). Labor supply is composed of two components: locally employed residents and locally employed non-residents or incommuters. Locally employed residents equals the resident labor force less unemployed and outcommuters. In- and out-commuters are separated here, rather than combined into net commuters, because they persist in the long-term due to differences in preferences for public services, spatial amenities, occupational characteristics of households, and the existence of sub-markets for different labor skills. Labor force and incommuters are positive components of supply and outcommuting is a negative component. Unemployment is a residual negative component of supply. The expressions, as amended are derived by eliminating wages from the component supply curves by substituting the inverse demand curve. This introduces employment (demand) to the supply components. More formally, the model is developed as follows:

$$(1) \quad X_D = X_S,$$

equates demand and supply (local employment and employed labor force from all locations). The demand curve is

$$(2) \quad X_D = f(w),$$

(where w is the wage rate) which when inverted becomes

$$(3) \quad w = g(X_D).$$

Decomposing labor supply into its components gives

$$(4) \quad X_S = X_{LF} - X_U - X_O + X_I.$$

Each component of supply is a function of employment and a vector of supply shifters,

$$(5) \quad X_{LF} = f_L(w, Z_{FL}) = f_L(g(X_D), Z_{LF}),$$

$$(6) \quad X_O = f_O(w, Z_O) = f_O(g(X_D), Z_O), \text{ and}$$

$$(7) \quad X_I = f_I(w, Z_I) = f_I(g(X_D), Z_I),$$

where, X_D is labor demand (local employment), X_S is labor supply, made up of its components, X_{LF} (resident labor force), X_O (outcommuters), X_I (incommuters), and X_U (unemployed), w is the wage rate, and the Z s are supply shifters for the various components of supply.

Given the discussion and the conceptual model above, equations 4 through 7 can be expressed as follows in equations 8 through 11.²

$$(8) \quad \text{Unemployed} = \text{Labor Force} + \text{Incommuters} - \text{Employment} - \text{Outcommuters}$$

All three components of labor supply will be primarily determined by employment in the location in question. In addition, they will depend on relative housing conditions, costs of living, quality of public services, tax levels, the mix of jobs, and similar variables in the location of employment, versus alternative locations. In addition, residential labor force will depend on the size of the area, while commuting will depend on the distance between place of residence and place of work.

$$(9) \quad \text{Labor force} = f(\text{employment, housing conditions, cost of living, public services, taxes, industry mix, area}).$$

$$(10) \quad \text{Outcommuting} = f(\text{employment, external employment, external labor force, housing conditions, cost of living, public services, taxes, industry mix, distance to jobs}).$$

$$(11) \quad \text{Incommuting} = f(\text{employment, external employment, external labor force, housing conditions, cost of living, public services, taxes, industry mix, distance to residence}).$$

Population is hypothesized to be functions of labor force and variables which affect the labor force participation rate and the dependency ratio.

$$(12) \quad \text{Population} = f(\text{labor force, dependency rate}).$$

Fiscal Impact Equations

Changes in employment are usually accompanied by changes in the tax base and changes in the need for expenditures. New employers, employees and population require

² If ones estimate of employment is defined as jobs, rather than the number of persons employed, then it will include second jobs. In this case, employment as defined here equals jobs less second jobs. Alternatively, one must augment the supply of labor by the number of individuals holding second and third jobs.

expenditures for services and investments in infrastructure.

The demands for public services by residents depend on such factors as income, wealth, unemployment, age, and education. As growth changes these characteristics, the demand per resident will rise or fall. Furthermore, as a community grows the average cost of producing public services often decreases, until all economies of size are captured, and then increases, when inefficiencies creep in to the process. Together, the changing demand and efficiency determinants mean that each economic change will have a unique effect on needed expenditures.

It is assumed that local governments consider the demands of their constituents, and provide the desired level of services at the lowest possible cost. When tax bases and the demand for expenditures are known, local governments are assumed to adjust tax rate to balance their budget.

Following Hirsch (1970 and 1977); Beaton; Stinson; and Stinson and Lubov; unit cost of public services are hypothesized to be a function of the level, and quality of services, important local characteristics (input factors and demand factors), input prices, and the rate of population growth. Furthermore, theory suggests that public services may be subject to increasing, and/or decreasing returns to size. Based on these theoretical relationships local government service expenditures per capita were hypothesized to be determined as follows:

(13) Expenditures = $f(\text{quality, quantity, input conditions, demand conditions})$.

For each type of expenditures (public works, police protection, administration, parks and recreation, welfare, education, fire protection, etc.) the independent variables are defined differently. For education enrollment is the quantity variable, teachers per thousand students is a quality variable, federal aid and change in enrollment are input conditions, and income, real property, and employment are demand conditions. For police protection, population is the quantity variable, solved crimes is the quality variable, percent population in towns, incommuters, and miles to the nearest metropolitan area are input conditions, and income and personal property are demand conditions.

Many non-local revenues (from state and federal agencies) are at least partially formula driven. Even when this is not the case, certain local characteristics may indicate the expected level of these revenues. In addition, non-local revenues are frequently an inverse function of the locality's ability to pay and a direct function of its degree of political influence. Ability to pay is usually related to per capita income, personal property per capita, and real property per capita.

(14) Non-local aid = $f(\text{expenditures, income, personal property, real property})$.

Another important source of local revenues is sales tax revenues. The level of retail sales is primarily a function of income. This relationship is expected to change with the size of the locality since larger localities are usually higher order service centers. The number of incommuters are also hypothesized to influence sales because they increase the daytime population of the community. Sales tax revenues are hypothesized, therefore, to be:

(15) Sales tax Revenues = $f(\text{income, employment, incommuters})$.

Other local revenues, other than property taxes, include licenses, fees, fines, forfeitures, and special assessments. These revenues are hypothesized to be related to the level of

commercial activity (retail activity) in the community and the income level. Thus:

(16) Other Tax Revenues = $f(\text{Sales tax revenues, income})$.

Real property includes both residential and business property and, therefore, will be influenced by the level of personal income as well as the size of the economic base. Both personal and real property are hypothesized to be positively related to the number of outcommuters since these families represent a source of wealth that is not supported by the local economic base.

(17) Real Property = $f(\text{income, employment, outcommuters})$,

(18) Personal Property = $f(\text{income, outcommuters})$.

There are a number of ways to close this type of mode. In the case of the VIP model it is assumed that local government expenditures are determined first, and real and personal property tax rates are set to cover those expenditures not met by non-local aid and sales tax revenues and other tax revenues. This implicitly assumes that budgets are balanced each year. An alternate assumption (the one used in the Show Me) is that the tax rate remains constant and that economic changes lead to fiscal deficits or surpluses.

EXPERIENCE WITH THESE MODELS

To date, VIP and Show Me models have been developed for forty to fifty communities. A related model developed at Iowa State University has been employed for several Iowa communities. Local advisory committees are usually appointed to review the baseline projections, help form the scenarios, review the model's projection, and to help interpret the results. The models have been used for a variety of purposes including analyses of annexations, jurisdictional mergers, new industries, existing industries, industry closures, university research parks, shopping centers, residential developments, location of industrial sites and, and general development strategies. They have also been used for goal planning for several communities. Goal planning with the models is achieved by estimating the conditions necessary to bring about a desired set of terminal conditions.

The models have generally been popular with local and state governments. Policy makers are generally somewhat skeptical until they come to appreciate the information generated and become more confident in the projections. Repeat users of the model's projections especially like the comparability of the results from case to case, and across communities.

CONCLUSIONS

Nelson offers a six point test for relevance of policy analysis. These points are that the analysts must:

- 1) take a prospective orientation -- a forward looking view of likely events;
- 2) accomplish effective problem definition -- that is that they identify important future

policy issues and questions;

- 3) have access to a network of experts;
- 4) estimate direct and indirect effects of issues and policy alternatives;
- 5) have access to databases which match their needs; and
- 6) be an active participant in the delivery of policy relevant information.

The community modeling framework described here makes it much easier for policy analysts to pass this test.

The models will not help analysts anticipate issues but they will certainly give them a prospective orientation regarding the consequences. The models will (and already have) provided bases for a network of experts. The models are explicitly designed to predict direct and indirect effects of issues and policies. They will use, create, and ensure relatively uniform data bases for policy analysis. And experience demonstrates that these models open the door for analysts to engage meaningfully in the policy making process.

REFERENCES

- Beaton W. Patrick. *The Determinants of Police Protection Expenditures*. National Tax Journal 24 (1974): 335-349.
- Halstead, John M., F. Larry Leistritz, and Thomas G. Johnson. 1991. *The Role of Fiscal Impact Models in Impact Assessments*. Impact Assessment Bulletin 9 (Fall): 43-54.
- Hirsch, Werner Z. Economics of State and Local Government. McGraw-Hill, New York, 1970.
- Hirsch, Werner Z. *Output and Costs of Local Government Services*, Paper for the National Conference on Non-Metropolitan Community Services Research, Ohio State University, Columbus, Ohio, January 21, 1977.
- Johnson Thomas G. *A Description of the VIP Model*, Unpublished manuscript, Department of Agricultural Economics, Virginia Tech, Blacksburg, Virginia, April 1991.
- Johnson, Thomas G. *Representative Community Analysis*, paper presented in a symposium entitled, "Rural Impacts of Public Policies: Improved Analytic Frameworks," at the annual meetings of the American Agricultural Economics Association, Orlando, Florida, August 2, 1993.
- Stinson, Thomas F. *The Dynamics of the Adjustment Period in Rapid Growth Communities*, Prepared for Presentation at the WAEA Annual Meetings, Bozeman, Montana, July 24, 1978.
- Stinson, Thomas F. and Andrea Lubov. *Segmented Regression, Threshold Effects, and Police Expenditures in Small Cities*. American Journal of Agricultural Economics 64 (November) 1982: 738-746.

COMMENTS ON: "AN INTRODUCTION TO COMMUNITY POLICY"

ANALYSIS SYSTEM, COMPAS”

Mark S. Henry
Dept. of Agricultural and Applied Economics
Clemson University

Introduction

The paper by Johnson, Scott and Mia describes an ongoing modeling effort to provide economic intelligence needed by community leaders. Model estimates can be used to help community leaders understand the consequences of public policy actions they may take or actions that may be imposed on them by Federal and State governments. The authors are part of a group that is embarked on a difficult but timely journey to fill this information gap -- primarily through the research and outreach activities of Land Grant Universities(LGUs). Their efforts represent some of the best work LGUs have to offer in community economics and policy analysis. The Community Policy Analysis System(COMPAS) is likely to be a showcase for displaying how the LGUs can meet the needs of community leaders in rural America in a timely and effective manner.

Given that this modeling effort is worthy as well as ambitious, let me now turn to some concerns and questions that can be raised about the content of this paper and some broader issues that may need to be addressed to give other analysts a better understanding and more confidence in the modeling efforts to date. My conclusion is that the authors need to establish a working paper series that addresses these issues and others related to the conceptual and econometric details of their efforts..

COMPAS – Why and Where Is It Going?

The two theses of the paper by Johnson, Scott and Mia(JSM) are:

1) Devolution of public policy from Federal to State and Local governments will produce strong growth in the need and demand for public policy analysis for state and local leaders. In turn, this provides a golden opportunity for regional economists and community development analysts to rethink and reestimate models that will help leaders understand their local economies and the socioeconomic consequences of public policy changes.

And,

2) The Virginia Impact Project(VIP) model and its cousin , Missouri’s Show-Me model, should be replicated for states and their constituent communities throughout the US as the Community Policy Analysis System(COMPAS). The implication is that the COMPAS approach to community policy analysis can provide measures of the effectiveness of alternative policy initiatives to local leaders that are accurate and timely.

The Devolution Thesi.

Will devolution be the catalyst that sparks a growing demand for community level policy analysis? I think the answer is yes but it is not clear that COMPAS type models will play a leading role in meeting this demand *as they are described in the paper by JSM*. Why? The COMPAS model appears to be designed for traditional fiscal impact analysis at the community level and not to address changes in the institutional responsibilities for delivering public services. Compare the COMPAS model structure with a single devolution issue: welfare reform.

Through the description of COMPAS by JSM in this paper, the reader can understand the big picture of how the model components fit together --- exogenous change in local employment generates a response from the regional labor supply (and its components). This drives population change and local fiscal impacts. As the authors note, these models have been developed for forty to fifty communities to analyze “annexations, jurisdictional mergers, new industries, existing industries, industry closures, university research parks, shopping centers, residential developments, location of industry sites, and general development strategies.”(JSM, p. 10). While these are important topics, there is nothing in this list of analyses that is linked to the devolution issue in an obvious way.

In contrast, one task facing many state and local governments is how to deal with welfare reform. Can COMPAS (version 1.0) help? Alternative welfare reform policy measures will force practitioners to evaluate how to provide job training, child care and transportation to current welfare clients within their budget constraints and to meet the goals of the new programs. COMPAS, as presented in this paper, is not designed to address these issues.

However, local labor markets will adjust on the supply side as welfare clients respond to new program incentives associated with welfare policy reforms. From a local labor market perspective, changes in wage rates and equilibrium employment levels will take place in response to shifting labor supply functions. The key issue with respect to COMPAS is whether or not local labor markets are idiosyncratic in responding to welfare reform. If they are, then parameters developed from cross sectional analyses of “community labor markets” will be of little use in predicting the reaction of a given “community” labor market to the labor supply shifts.

JSE recognize the geographical heterogeneity of labor market responses in principle number 4 (JSE, p. 3) that assumes similar labor market responses(this is the driving force behind all other responses) in “communities of similar size and with similar geographic relationships to nearby larger and smaller communities....” However, there is no discussion of data and how the model parameters are estimated. For example, are parameters estimated by size and geographical proximity subgroups to meet the heterogeneity principle? Indeed, there is nothing in the paper that reveals key empirical findings and standard measures of parameter stability and significance---making any judgment about the accuracy of the model parameters impossible. Of course, this may simply be the topic of a second paper on COMPAS -- one that many of the regional economists in the LGUs are eager to read.

Other devolution issues -- a reduced role for Federal subsidies in farming, telecommunications deregulation, and health care reform -- may all be topics where COMPAS can provide community level insights. However, it is not clear, from this paper, how COMPAS will do this. What is clear is that COMPAS has already proven to be useful in a range of traditional problems facing communities -- plant closings, annexation, etc. The authors, in the next summary of COMPAS, would provide a service to other analysts by showing how COMPAS can be used in the devolution arena.

Should COMPAS Be Transferred to Other States

As an inducement to others to help in the transfer of these models to other states, JSE need to reveal the problems and successes that they have had in their experiments with building the COMPAS models. There are important and standard research questions that are not addressed in this description of COMPAS. What are the units of observation-- cities, counties, census tracts, school districts...? What functional form was used? Where are the equations reported? What are the statistical properties of the estimated equations? How did the equations compare across the two states -- Virginia and Missouri?

In addition to answers to these standard research questions, there are three key questions that can be raised about the proposed transfer of COMPAS to other states. These questions include:

- Are structural economic models needed that specify hypothesized behavior of agents in the model?
- Are there econometric problems in using cross sectional data to make predictions of single community behavior?
- As models for outreach programs for community based analysis and planning, does COMPAS give local leaders the information they need to make sound judgments on public policy initiatives?

Structural model issues. COMPAS uses a logic that depends on changes in employment as the “fundamental engine for economic growth” (JSE, p. 3). More specifically, “economic growth is caused largely by exogenous increases in employment” (JSE, p. 3). This is akin to an economic base model that has export base activities driving the rest of the economy without feedbacks. And since this version of COMPAS assumes a perfectly elastic labor supply function (JSE, p. 4), the exogenous change in demands for labor translate into changes in employment (presumably both direct and indirect) at prevailing wage rates.

At this juncture, the new employment is allocated between several components of the local labor force. The equations used, (8) through (11), appear to be the structural equations but they are in a very general form and there is no discussion of how labor market participants are expected to behave. Why do some residents decide to commute? Why do some stay at home to work? Why do some stay unemployed or stay out of the labor force altogether? So these equations represent

reduced form equations without a parent set of structural equations.

As a pragmatic approach, these equations can be thought of as equations that allocate an exogenous demand for new employees in a given place to the components of the regional labor supply based on variables that the regional economics literature suggests are important in labor force participation and commuting behavior. Using the same *ad hoc* approach, Public sector expenditure and revenue equations are estimated in equations (13) through (18).

Structural equation issues may be grouped into three sets of concerns. First, there is a simultaneity concern. The Labor force, Outcommuting and Incommuting equations (9-11) all include “public services” and “taxes” as independent variables. However, the public sector expenditure and revenue equations (13-18) contain demand conditions, incommuters, outcommuters and/or derived incomes as independent variables too. Further, the assumption of exogenous labor demand means that there is no feedback *from* the added local labor force participation and reduced unemployment associated with the demand shock *to* additional (indirect and induced employment in input-output terms) new employment in the community and region.

Second, the reasons that decisions are made to increase or decrease public expenditures and revenues may vary greatly across rural America. There are the obvious institutional differences across states – tax rates and tax base assessment procedures, legal limits on local taxing and expenditure authority, *etc.* Moreover, local attitudes, rooted in local socioeconomic characteristics, may yield quite different responses to an exogenous change in local employment/income. Consider a hypothetical example. Perhaps rural residents in Oklahoma take great pride in quality schools and if employment and income increase, they are likely to invest more in school facilities. In rural Florida, with no income tax, increases in income and employment from added retirees in rural places may have no effect on added school funding. The Florida reduced form equation that uses employment and income change from a “shock” to generate taxes yields no added school revenues. If the retiree growth adds to the real and personal property tax base, retirees may vote for reduced tax millages. The point is that rural residents in different states may have different sets of reasons for making decisions on desired levels of public sector activity .

Accordingly, each state analyst will need to have a good structural model in mind for public sector behavior across a wide array of expenditure and revenue equations. This does not mean that useful reduced form equations can not be developed – as they have been in Virginia and Missouri. However, it will be much more difficult a task than simply finding the state data from a set of variables from the VIP model and reestimating the reduced form parameters as illustrated in equations (13) to (18).

Third, there is a concern for the spatial structure of the models. What can the set of recursive equations (8) through (18) tell us? Take a new BMW plant locating in community X with 1000 employees. Although not described in the paper, it appears that some external analysis must be used

(IMPLAN?) to find the total (direct and indirect employment) from the new plant – say it is 1500 total employees. Now COMPAS enters the picture to allocate the employment to the components of labor supply: added labor force participants, incommuters, outcommuters, and the unemployed pool. But there is no discussion of the geographical structure of the problem. If the focus is on Community X where the direct 1000 jobs are located, do we also assume that the 500 indirect jobs are also located in Community X? This seems unlikely if there is substantial commuter activity.

Next, the new jobs (say they are all in Community X) will be filled, in part, by added incommuters to X. It is important to know where these incommuters live – Communities Y and Z – if the fiscal equations are to be useful in helping leaders in Communities Y and Z to understand the impacts of the new plant on them. In brief, the spatial structure of the problem is not clear from the paper. Again, this may be the topic for a second or third paper on COMPAS that will be widely read by regional economists in the LGUs.

However, assume that the employment impacts from the new BMW plant in X are known for all affected communities, X, Y and Z. Can the reduced form equations (even if they are the appropriate set for this state) be expected to yield reasonable results? Turn next to a basic econometric question – can parameter estimates from cross sectional observations across a wide range of small and large communities say much that is meaningful for a given community like X?

Selected Econometric Issues. While there are a host of interesting spatial econometric issues that can be listed in a large scale modeling project like COMPAS (see Anselin, 1988, for example), this comment will consider only one basic issue. Call it the Courant critique -- after the author of a paper that should be required reading for regional analysts, “How Would You Know a Good Economic Development Policy If You Tripped Over One? Hint: Don’t Just Count Jobs” Courant(1994). One message from Courant is that cross sectional regression parameter estimates may have limited uses in making predictions for a given local economy.

Why? He attributes the problem to geographical heterogeneity that is very difficult to control in statistical models. Recall that regression lines go through the means of the conditional probability density functions(PDFs). The “conditional” is on the size of the “X” fixed variable. For example, in equation (11) that predicts Incommuting, assume a single fixed variable, employment. Now regress Incommuting on employment across 100 sample places. Say that 10 places had employment of 1,000, 10 places had employment of 10,000, 10 places with employment of 20,000, *etc.* ending the sample with 10 places that have employment of 90,000. The regression line will go through the mean of each conditional PDF for Y(the Incommuting random variable) i.e., for the places with 1,000 employees and the places with 10,000 employees, *etc.* Assume the regression slope parameter estimate is 0.1.

COMPAS estimates that an increase in employment of 1,000(a new plant) in place Z will mean 100 added incommuters to Z. But this parameter represents the “average *marginal* impact”(Courant, p. 878) of the new employment on incommuting. And this marginal impact is assumed to be constant

across all size places. If a place Z1 has 1,000 employees, adding a new plant with 1000 employees will bring in 100 incommuters; if place Z2 has 90,000 employees, adding a new plant with 1000 employees will still bring in 100 incommuters. While this is possible, it seems likely that smaller places will require more incommuters than larger places for a given exogenous employment shock. The point is that the slope parameter may not be constant across places of different sizes or geographical locations or other place characteristics.

There are several options. First, assuming that each place is unique in an important way, geographical heterogeneity means that corrections using location specific “fixed effects”(Courant, p. 878) may be warranted. Of course, this causes problems in estimation if only one year of data is available. A second, less restrictive, assumption is that there are important subgroups (by size and geographical situation) but that the slope parameter is constant within each subgroup. This seems to be consistent with JSE principle (4) and implies that the equations need to be estimated for the size and location subgroups described in the JSE paper. One technique would be to use spline regressions with ‘knots’ at community sizes where the slope is likely to change.

A third option is to assume that the slope changes over the entire size range and it is simply a matter of finding the best functional form to reflect how the slope changes.¹ Although not explicit about it, JSE appear to use this approach as noted on page 3, “Experience ... indicates that with careful selection of variables and functional form, stable coefficients can be estimated for communities with a wide variety of sizes and economic bases.” But this seems inconsistent with the JSE principle (4). Finally, each of these options allows for tests of the constant slope assumption and results of these tests would be of great interest to the research community . Another working paper is needed.

In sum, parameters estimated from cross sectional based regressions that are used for predictions applied to a single community need to be interpreted with caution. First, they capture average *marginal* effects across the range of places used to estimate regression parameters if there are no adjustments for geographical heterogeneity. Second, since the individual community is the subject, the confidence intervals around the predicted values will be large relative to those when making predictions for the average community of a selected size. Finally, places that are far from the sample mean (on the fixed variables) will have large confidence intervals for predicted values.² Again, there is a interesting paper still to be written that explores these issues when COMPAS is used to make predictions for a single community.

Outreach Issues: Will Community Leaders Get Information They Want? Or Need?

COMPAS is a complex effort that represents a step forward from the Clayton type fiscal impact

¹ This was the suggestion of my Clemson colleague, Steve Miller.

² This was David Debertin’s comment expressed during the general discussion of the paper by JSE.

models that relied on assumptions about key local labor market parameters. And the advantages of spreadsheet techniques and laptop computers represent a technical advantage over FORTRAN mainframe technology. On both these grounds, the prospect for using COMPAS in extension seems good. The issue is more along the lines of providing the kinds of information that state and local leaders need to know in evaluating the benefits and costs of public policies to stimulate local development or to cope with devolution.

The difference between what local leaders say they *want* to know (e.g., number of new jobs) and what they *need* to understand is an important distinction. For example, local leaders should look not only at crude indicators of impacts (new jobs) without regard to costs of obtaining the jobs.; leaders need to know who benefits and who pays the costs of new development; and, the pursuit of elusive short term “demand” side shifts in employment demand may be less desirable than longer term efforts to enhance the “characteristics of labor supply” (Courant, p. 877) that serve as the basis for new economic activity. How is COMPAS likely to fare in providing answers to questions that leaders should be asking? It’s a mixed bag.

New Jobs and New Costs. COMPAS is well suited to evaluate the net new local public costs of providing public subsidies to stimulate new local economic activity if the revenue and expenditure functions capture local (city, county, school district, special purpose district), and state impacts. Indeed, if done correctly, the net fiscal impact statements could be used as the basis for transfers from the state to local jurisdictions (or vice versa).

Who Benefits and Who Pays? Many local development efforts are fostered by “ a pro-subsidy coalition of landlords and owners of fixed capital that produce for local markets.”(Courant, p. 874). These local real estate and commercial interests are happy to see new immigrants – especially when they bear little of the local cost of providing public services or in providing the initial subsidy. Local leaders requesting COMPAS information (elected officials, staff, and committees full of real estate and commercial interests) often *want* to show how big the impact (new jobs) on the community will be from a new plant, a new highway, *etc.* What the local community *needs* to know is how much they will pay in new taxes, what the distribution of the benefits are – who is likely to get the jobs and added income, for example. If I live in community X that will have higher taxes or lower quality public services as a result of impacts from a new plant employing incommuters or immigrants, my community leaders should let me know before they pursue the plant. COMPAS should be designed to address the distributional issues as well as aggregate impacts. Again this is another paper to be developed by the authors in their working paper series.

Long run Vs Short run. Finally, COMPAS is not supposed to provide benefit/cost analyses but it could be used as a vehicle for improved understanding of the economics of alternative development scenarios. Are short run subsidies to attract a new plant (a demand side ploy) likely to yield long run economic benefits compared to alternatives such as added investment in schools, public infrastructure, *etc.* ? As COMPAS evolves, both short run and long run responses to alternative public policy initiatives should be evaluated. Local leaders need to know what the impact of their

decisions are both in the short and long run. More importantly, citizens of these communities need to know why a public policy initiative is needed; who is benefiting and who is paying for the public sector activities. As Courant puts it, “ If we go back to basics, and require that policy enhance welfare, and point to the mechanism(s) by which private markets are failing to maximize welfare, we may improve the quality of policy and the focus of policy-relevant research.” (Courant, p. 877).

References

Anselin, Luc. 1988. *Spatial Econometrics: Methods and Models*. Dordrecht: Kluwer Academic Publishers.

Courant, Paul N. 1994. “How Would You Know A Good Economic Development Policy If You Tripped Over One? Hint: Don’t Just Count Jobs.” *National Tax Journal*. XLVII:4:863-881.

Johnson, Thomas, G. , James K. Scott, and Jian Ma. 1997. “An Introduction to the Community Policy Analysis System, COMPAS.” Paper presented to the SERA-IEG 53 meetings, Birmingham, Alabama, Feb. 1.

TELECOMMUNICATIONS TECHNOLOGY AND BUSINESS LOCATION: A REVIEW

Edward J. Malecki
Department of Geography
University of Florida

This paper reviews a selection of recent research on the impact (potential and actual) of telecommunications on business operations. Special attention is paid to effects on the location of business activities, both within multi-site corporations and single-location entrepreneurial firms. At the same time, it addresses the complementary concern of places (towns, cities, and regions) for economic development in the context of advanced telecommunications technology. In no way is this paper a comprehensive examination of telecommunications; with each new study were found additional references to others. However, it is a reasonable overview of issues on the topic. Intentionally omitted from the paper are public-service functions of telecommunications, such as telemedicine and distance education. While these technologies have received a lot of attention — and government funding — they are not directly relevant to private-sector organizations/enterprises and their locations.

The earlier telephone network, while still not available outside rich countries, is seen as a basic infrastructure, along with electricity, water, and transportation (World Bank 1994). The rich countries of Europe, North America and the Pacific have progressed beyond plain old telephone service (POTS), and in the emergence of these new technologies we see that the “new information infrastructure” requires a strong public presence. Without a government commitment to connect all places, it is possible that many of the new technologies will be unavailable to those remote from “adequate-sized markets.” The policy objective of “universal service” is becoming more difficult to attain than when the technologies were fewer and simpler (Office of Technology Assessment 1991; Ypsilanti and Kelly 1994). Finally, an issue that affects nearly anyone involved in rural development is the fact that the technologies of telecommunications tend to favor urban and suburban areas earlier and to a greater degree.

The paper begins with an introduction to some of the concepts and general issues surrounding telecommunications. This is followed by an examination of telecommunications as a factor of production, both in general and for knowledge-based economic activities in particular. Brief consideration is given to policies to enhance telecommunications infrastructure and to the tradeoff

Paper prepared for presentation to the Southern Extension Research Activities Information Exchange Group 16 (SERA-IEG-16), meeting with the Southern Association of Agricultural Sciences, in New Orleans, January 1995. This research was partially supported by the U.S. Department of Agriculture's Cooperative State Research Service (CSRS) National Research Initiative Competitive Grants Program (NRICGP) Grant #93-37401-8989.

between travel and telecommunications, considering the perennial prediction that such technology will dramatically reduce or eliminate the need for travel and face-to-face contact. Finally, the situation of rural areas is discussed, with two objectives: first, to probe the contention that rural areas are penalized relative to urban areas and, second, to provide a preliminary assessment of the effects a concerted telecommunications policy for rural regions might have.

Telecommunications: An Introduction

Communications, along with transportation technologies, are the “enabling technologies” which have enabled multisite — even global — business operations (Dicken 1992: 103). The electronic revolution has permitted a flood of innovations for collecting, storing, displaying, and transmitting information. Computers, office products, and telecommunications have converged into a single “new information technology” or information-processing industry based on digital telecommunications (Forester 1987; Hall and Preston 1988; Heldman 1994; 1995; Saunders, Warford, and Wellenius 1994). Table 1 illustrates the explosion of new technologies in telecommunications. At the same time, the growing spatial division of labor within firms has induced much larger communications needs (Nicol 1985).

Satellite systems are a central element in global communications. Satellites provide two-thirds of all overseas telephone capacity, virtually all trans-oceanic television transmission, and private circuits for large corporations (Langdale 1989; Wheelon 1988). Satellites compete with fiber-optic (or optical fiber) cables, which require no amplifiers and carry much greater capacity, but at higher cost than satellites. Submarine fiber-optic cables have been able to concentrate on the high-traffic routes across the North Atlantic, replacing older cables, many of which did not incorporate postwar technological innovations, such as coaxial cable and improved amplifiers. Facsimile transmission has added to high levels of voice traffic on these (as on most) routes (Hottes 1993). Fiber-optic cables have provided a new vitality to submarine cables, which had been “declared dead twice — first with the introduction of the radio, second with the growing application of satellites in the 1970s” (Hottes 1993: 102).

Steady decreases in the price for satellite users (from \$32,000 per half-circuit a year in 1965 to \$4,400 in 1987) have created “an efficient division of business between cables and satellites.” Satellites are more profitable for the transmission of pictures, and are effective for serving areas with low population density, whereas high-traffic routes are best served by fiber-optic cable (Hottes 1993: 102-103). Satellites, by being able to transmit to any ground-based receiver below, create a more dispersed and equitable network, whereas fiber-optic cables require physical links and are point-to-point in nature (Moss 1987; Saunders, Warford, and Wellenius 1994: 40).

An important dimension of the global telecommunications network is the overwhelming role of the major network operators, such as AT&T, Cable & Wireless, MCI, and British Telecom, which effectively define the capabilities in any place. There is fierce competition among these firms for

Table 1

Historical development of telecommunications technologies

Pre-1920	1920-1950	1950-1960	1960-1970	1970-1980	1980-1990
Telegraph Telephone	Telegraph Telephone Television Telex Radio Military mobile radio	Telegraph Telephone Television Radio Military mobile radio Video tape recording Cable TV Microwave links Mobile telephony	Telegraph Telephone Television Radio Military mobile radio Video tape recording Cable TV Microwave links Mobile telephony Digital communications Communications satellites	Telegraph Telephone Television Radio Military mobile radio Video tape recording Cable TV Microwave links Mobile telephony Digital communications Communications satellites Facsimile Packet switching Videotext Optical fiber Videodiscs Paging Computer-aided design (CAD) Remote sensing	Telegraph Telephone Television Radio Military mobile radio Video tape recording Cable TV Microwave links Mobile telephony Digital communications Communications satellites Facsimile Packet switching Videotext Optical fiber Videodiscs Paging Computer-aided design Remote sensing Cellular radio Private satellites Integrated service digital networks (ISDN) Personal telephones High-speed data

Source: Compiled from Arnold and Guy (1989), Figure 4 and Figure 9

access to new markets (especially less-developed countries and those beginning to be deregulated) as well as growing markets in industrialized countries (Bernard 1992).

In addition to satellites and fiber-optic technology, integrated services digital network (ISDN) standards allow shared voice, data, facsimile, and pictures to move in digital mode over copper wires (Heldman 1994). Its principal advantage is to permit a range of communication over existing telephone networks, rather than requiring new infrastructure. Widespread availability in the US (hailed since the mid-1980s [Keller et al. 1986]) has been delayed, critics say, by continuing government regulation on the telephone industry. In addition, costs and lack of standardization have kept nationwide ISDN development below the level found in “islands” of use concentrated in large cities (Gregg 1992). However, recent demand for Internet access has spurred ISDN in the U.S.; it is already widespread in France, Germany, Japan, and the U.K. (*The Economist* 1995b). Ford’s global network illustrates the advantages of ISDN: improved transmission speed, ability to take advantage of digital technology, and standardization across locations (Dixon 1992). As another example, using ISDN has reduced call handling costs by 44% for a major regional claims processing center (Harbaugh and McMahan 1992: 26). Complicating the policy choices concerning construction of local ISDN (or other broadband or high-capacity) networks is that many firms have already built their own local area networks (LANs) and even connections to existing wide area networks (WANs). Thus, it is unclear to what extent local (metropolitan-area networks — MANs) networks are relevant. WANs include public data networks and private data networks, whether owned by a corporation or managed by a communications carrier.

Both technological capabilities and regulatory issues are far from resolved at this time (Linhart, Radner, and Tewari 1992; Schwartz 1994). The major regulatory issues tend to revolve around the details of and fees for interconnection with local exchange companies (Brock 1994: 243-256). At the same time, new players are entering the business as telecommunications providers, including utility companies, cable television firms, and gas pipeline companies (Arnst, Kelly and Burrows 1995). Meanwhile, technological issues are unresolved as well, and some observers believe that broadband ISDN and fiber optics could replace satellites completely (Solomon 1990). The uncertain nature of telecommunications technology, yet its tendency to be cited as a major force for the future, has led Mansell (1990) to refer to telecommunications infrastructure as “the new ‘black box’.” Much of the uncertainty centers on standards which now must interface myriad national systems in order to provide a seamless global network of a greater number of more complex technologies (Drahos and Joseph 1995; Drake 1994).

Business Use of Telecommunications

To businesses, telecommunications networks used to be like electricity, water distribution, and other utility networks. They were an important resource, but one about which a firm could do very little. Firms had little choice about the equipment they could get or the services they were offered. That was when all that was available was POTS — plain old telephone service. Today, corporate users are putting together entire networks, either completely under their control or using circuits leased

from common carriers, bypassing the public network partly or entirely. Together, deregulation and the new digital technologies have permitted firms to consciously design and operate internal telecommunications networks to decisively enhance their competitive position (Bar et al. 1989: 47-48; Hagström 1992). “What used to be a cost of doing business is becoming a source of competitive advantage” (quoted in Cohen and Zysman 1987: 179; Keen 1991). Telecommunications services are used by all economic sectors, from mining and agriculture to manufacturing and tourism (Miles and Thomas 1990). Private networks and sophisticated use of telecommunications is now a fact of everyday life and of business operation (Mansell 1994).

Firms as consumers of telecommunications services utilize them both internally and externally (Markus 1992). When firms conduct a large volume of transactions with a few, clearly identifiable external parties, they occasionally configure and manage limited-access networks employing components and transmission services purchased from outside vendors. An example is electronic data interchange (EDI) between a company and its major suppliers. By and large, however, most firms meet their general external communication needs through connection to wide-access networks owned and managed by external suppliers, such as common carriers. There are many reasons for this behavior, including cost, regulation, and the difficulty of anticipating future external communication needs (Markus 1992: 438). The distinction between internal (intra-organizational) and external communication, then, revolves around the firm’s priorities regarding universal access of all employees to outside communication, and the tendency for relatively few (or many) employees to make regular contact outside the organization.

Large users have sophisticated needs and require systems that are cost-effective, flexible, secure, automated, integrated, and dependable. When local providers do not meet these needs at a reasonable cost, they do not hesitate to develop private networks and other solutions (Schmandt et al. 1990: 293). Multinational firms typically coordinate production and marketing by means of satellite-based communication systems. IBM, for example, has an elaborate international network which links its offices, factories, computer centers, and other facilities (Bakis 1987). Ford Motor Company has built a transatlantic system of linked computer networks with video-conferencing capability to coordinate product development and manufacturing design (The Economist 1995a). The system grew out of earlier networks initiated within Ford of Europe, designed to centralize design and facilitate transfer of CAD/CAM (computer-aided design and computer-aided manufacturing) data among company locations (Dixon 1992). In the retailing sector, Wal-Mart Stores uses a leased satellite transponder to link its 1700 stores to its Bentonville, Arkansas headquarters and 14 distribution centers, tracking every item sold at each checkout and playing the same background music in each store (Heenan 1991: 69; Bernal, Stuller, and Sung 1991: 36-43).

Intrafirm communication within global corporations takes place largely by means of leased networks. While information flows take place in many forms (personal contact, mail, courier), leased networks offer numerous advantages, such as lower costs, security, and compatibility of computer standards (Langdale 1989: 503). The users of leased networks tend to be large multinational (or transnational) firms, and they account for a large share of all international business communication. Smaller

companies are generally unable to operate leased networks because of their cost; they are economical only if the organization is large enough to generate sufficient traffic to save on the more expensive public switched services. Citicorp has one of the largest networks, connecting 145 operations in 74 countries. However, the corporate hierarchy remains dominant; nearly 50% of all traffic on the network originates in the New York region (Langdale 1989). Teleports fill yet another niche in the evolving telecommunications infrastructure. A teleport is a type of ground-based facility to facilitate the transmission of large volumes of financial and other information between satellites and local clients. The high fixed costs and low marginal costs make teleports especially attractive to small users who could not afford private systems. Within cities, but especially the large office-based cities such as New York, Chicago, and Washington, fiber-optic networks provide access to satellites links at local teleports that provide an alternative to the public network (Warf 1989). Although there are now dozens of teleports worldwide (Warf 1989), they have not emerged as significant elements in the local infrastructure in most cities, except when linked with commercial real estate development, as in Dallas, New York, or London (Hepworth 1990: 196-199; Schmandt et al. 1990: 292).

It is difficult to compare the telecommunications infrastructures of different cities, although Stover (1988) has compiled these for four Texas cities. For example, the quality of the local phone system — whether it has digital switching and the extent to which fiber-optic cable has been deployed — is an indicator of local telecommunications carrying capacity. The presence of private branch exchanges (PBXs) is indicative of high-volume users who can afford their own internal systems (and whose volume warrants the economies achieved by a private system). Finally, the availability of satellite uplink and downlink facilities can be critical to large corporate and institutional users. Schmandt et al. (1990) conclude that variations in the availability and configuration of advanced communications systems from city to city depend on several variables: (1) topography and geographic location, (2) the presence of special events or priorities that cause cities to upgrade telecommunications (e.g. the Olympics in Los Angeles and Atlanta), (3) large users' perceptions of available services and their use of bypass, and (4) initiative and innovation on the part of providers (Schmandt et al. 1990: 291). They report, for example, that the local exchange carrier in Atlanta (Southern Bell) is perceived as proactive, and few firms bypass the local network.

Examples of firms and operations that depend heavily on telecommunications include: those with credit card authorizations and billing operations, customer service 800 numbers, outbound active telemarketing using automatic or human dialing systems, central publishing and facsimile transmission to remote printing locations, central transactional processing for accounting and other types of record-keeping, and financial transactions including brokerage, consumer loans, mortgage loans, and other bank-related transactions (Hack 1992b: 71). Among the largest users of telecommunications technologies are financial service firms (Warf 1989). Firms that are large telecommunications users rate demonstrated reliability, fiber-optic cabling, and ISDN as the most important elements of telecommunications infrastructure in business parks (Lyne 1991). Some telecommunications providers have even become partners in business parks, such as GTE's "SmartParks" and BellSouth's Paducah (Kentucky) Information Age Park (Venable 1991: 1198).

Telecommunications as a Factor in Location

Just as the construction of new infrastructure networks of earlier eras — such as the railroads and the interstate highway system — altered the relative value of locations, the new telecommunications infrastructure is doing the same thing today (Cohen and Zysman 1987: 185-186). Flexible production processes and segmented markets demand advanced communications services (Twenhafel et al. 1989). A recent survey of economic development executives found that 38% of them say their area's telecommunications infrastructure recently played a primary role in attracting a new corporate facility (Venable 1993). The principal effects of improved telecommunications are both to disperse some operations to take advantage of other locations factors, such as low-wage labor, and to concentrate other activities in a small number of urban agglomerations.

Most studies of location factors, or influences on the location of economic activities, have not considered telecommunications as a separate item. Hack (1992b: 71) reports that “a review of almost every list of plant location factors that has been published in the last 20 years reveals the absence of the telecommunications factor.” Virtually all studies and lists of location factors fail to include communications infrastructure at all (Barkley and McNamara 1994; Browning 1980, Coffee 1994; Fortune 1989, Harding 1989; Hunker 1979, McGraw-Hill 1980, Premus 1982, 1986; Schmenner 1982, Vaughan 1977).¹ Communications also is absent from the annual Development Report Card for the States (Corporation for Enterprise Development 1994) and the Grant Thornton Manufacturing Climates Study (Grant Thornton 1989).² The review by Blair and Premus (1987) of major factors in industrial relocation similarly omitted it, reflecting the situation in the numerous studies reviewed.

There are a few exceptions to the general absence of telecommunications in the analysis of business location. Moriarty's (1980: 70) list of infrastructure items includes roads, sewers, and water — all typically public-sector responsibility in this country. Later, in a discussion of utilities, he discusses new communication technologies, focusing on the fact that many rural areas and small towns have inadequate telephone lines for a firm's transmission requirements (Moriarty 1980: 216). Smith's (1981: 329) case study data of alternative sites for an electrical appliance plant includes some costs (less than \$24,000 per year) for interplant communication. Wilson and Teske (1990) cite numerous examples — rural as well as urban — of location decisions based on superior telecommunications.

In contrast to manufacturing facilities, office functions, such as business services and research and development (R&D) facilities rely on face-to-face for nonroutine information exchange (Czamanski 1981; Goddard 1978; Hessels 1992: 164). R&D facilities need to locate near company headquarters

¹ Telecommunications was even excluded from a list of 25 locational attributes in a survey study of research and development (R&D) location by Malecki and Bradbury (1992).

² Teleconferencing and its growing use in manufacturing is the only mention of telecommunications in recent editions of the annual Grant Thornton Manufacturing Climates studies (Fine 1989).

because of the need for managers to meet with scientific and technical personnel on a face-to-face basis, allowing close integration with marketing and product planning (Lund 1986: 10). Salomon (1988: 313) concludes that “the total communications costs and benefits (by both physical travel and telecommunications) are more likely to determine location than merely the availability of new technologies.” Shove (1991) cites Czamanski and the need for communication, but includes only air connections in his empirical analysis. Because businesses always have a certain amount of communications which requires physical travel, “it follows that remote location is a disadvantage, even if advanced telecommunications are available” (Salomon 1988: 322). Finally, Schmenner (1982: 38-39) discusses “sometimes neglected considerations,” including attracting and retaining engineers and managers and the movement of people and materials between facilities — a transportation issue — but he also omits telecommunications as a consideration.

Lund (1979), looking only at corporate headquarters and manufacturing plants, includes “technical services and communications” among seven variables in a category called operational convenience (out of a total of 26 variables). However, it is only tied for 5th among the seven variables in its category and 16th among all 26 location factors for headquarters. For the consideration of manufacturing plants, 22 factors are included, and only five under operational convenience; the location factor now becomes simply “technical services,” and it ranks 4th of five variables under operational convenience, and 14th among the 22 location factors.

The findings are also mixed in other studies. In a later study by Lund of R&D facilities, communications is left out of a list of 20 “site-location requirements,” all of which are overwhelmed by the necessity “to be near headquarters” and a supply of scientific and technical personnel (Lund 1986). Global firms see the need for links as more important. Communications was the second-ranked factor among 19 locational determinants for 42 foreign firms operating a national or regional headquarters in New York City, behind only access to timely information (Centonze 1989). The need for telecommunications in another part of the service economy — not-for-profit corporations, such as national trade and professional associations — was included in a study by Erenburg and Schuldt (1986). They found that communications was second among 11 factors characterizing support services, and 13th among 46 factors overall. In general, factors relating to facilities, employees, and transportation were rated as more important than support services such as communications.

Consultants such as Ady (1994) include state-of-the-art global telecommunications as an “imperative” in headquarters location, followed by a trained workforce, incentives, proximity to international airports, and labor costs and stability. The critical nature of air transportation has emerged in other studies (Browning 1980; Mahmassani and Toft 1985). A recent European study (Netherlands Economic Institute 1993: 11) suggests that Quality of telecommunications is important to a significant minority of office, service sector and distribution projects. For these projects, companies sometimes require a minimum standard of services to be available and locations where the quality of telecommunications is below that initial level may not even be considered.

This study clearly illustrates the difference between location factors for manufacturing plants and those for offices and knowledge functions. Quality of telecommunications was 18th among 23 factors for manufacturing but, for office location, quality of telecommunications is tied for 3rd among a set of 13 factors. Further, for services, telecommunications stood out among a set of 17 location factors (Netherlands Economic Institute 1993: 73-92).

The same holds true in the U.S., where firms state that “virtually everything that we do in today's modern business environment involves the transfer of enormous quantities of information over telephone lines” (Zall 1993: 32). Experts suggest that in the U.S., “the quality of telecommunication facilities and their costs vary enormously [according to geographic area]. There can be price differentials as high as five-to-one” (Zall 1993: 32; Hack 1992a: 138). Firms’ requirements for telecommunications fall into two categories: first, basic technology requirements, including digital switching, fiber-optic loop facilities, route diversity and disaster-recovery capabilities, ISDN, and multiple-carrier capability (for using public as well as private networks), and, second, a set of service and support requirements, such as outsourcing communications operations, rapid response for maintenance and service, multivendor coordination, and long-term relationships (Harbaugh and McMahan 1992: 28-30). Needless to say, these characteristics will vary greatly, with the highest levels generally available in large (metropolitan) markets, but we know too little about these cost and quality variations.

Telecommunication technologies have significantly reduced the technical constraints on the decentralization of business activities. This greater locational flexibility permits a firm to “follow locational factors to the far corners of the earth without losing its internal cohesion” (Chapman and Walker 1991: 11-12). Kellerman (1984: 236-237) describes the principal effect of telecommunications on industrial location as one of dispersion, especially to suburban and exurban sites within metropolitan areas. With regard to rural areas, telecommunications capability has reinforced the production and organization factors that have enabled dispersed location.

Local area networks have facilitated the deconcentration of back-office jobs (computer operations, accounting, payroll, billing, credit card services, and centralized word processing) from core to suburban periphery (Nelson 1986). For the individual firm, there are definite time-distance limits. The office must maintain access to the external economies of the metropolis and maintain face-to-face contacts between skilled back-office and headquarters personnel (Gertler 1989; Nelson 1986). Large firms, especially financial institutions and more technologically-sophisticated firms, are more likely to be involved in suburbanization (Kutay 1986). In general, suburban locations continue to appeal to information-intensive firms, because of their need for large numbers of relatively skilled workers (Leistriz 1992; Warf 1989).

Back-office jobs have shifted from nearby suburbs, to small towns in rural areas, to offshore sites in the Caribbean, Asia, and elsewhere (Glasmeier and Howland 1994; Grimes 1993; Hepworth 1990: 123). U.S. companies routinely do credit-card processing and other back-office paperwork via satellite in locations such as Barbados, China, India, Ireland, Jamaica, Korea, and the Philippines

(Heenan 1991: 127-128). The availability of state-of-the-art telecommunication service, a requirement for company back-office operations (Hack 1992a), is found in many potential locations, not just in industrial countries.

Despite the appearance of equal global accessibility and fully footloose firms, an “equal opportunity space” does not exist, mainly because of long-standing inequalities in telephone networks, which remain the “backbone” of newer systems (Salomon 1988). Salomon stresses the need to look not only at networks and links, but also at level-of-service, which generally is a function of bandwidth but which comprises the ease, convenience, quality and rates of telecommunications services (see also Langdale 1991 and Preston 1995). Newer technologies have essentially enhanced the capability of utilizing greater bandwidths to provide higher quantity and quality of service, but these technologies diffuse first to where there is greatest demand. Again, largest cities are first in adopting such technologies because business customers are the largest users.

The Location of Knowledge-Based Economic Activities

The almost universal availability of telecommunications capability is “creating a footloose economy that permits firms to locate where they want to be, not where the traditional centers of finance and commerce dictate they have to be” (Heenan 1991: 9; see also Hack 1993). Saunders, Warford, and Wellenius (1994: 121-134) similarly conclude that investment to provide telecommunications connectivity reduces the relative concentration of economic activity in large cities. The situation only two decades ago was “unclear,” with some information activities potentially quite footloose and others firmly rooted in central metropolitan locations (Abler 1974: 334). Britton and Gertler (1986) are more certain of the situation. They conclude that

the best location continues to be large urban centers. . . Regardless of their size, technology-intensive firms are dependent on both private- and public-sector contacts, and there is, therefore, an imperative for such producers to cluster in locations that afford them the best opportunities for face-to-face contact with actual and potential customers (Britton and Gertler 1986: 162-163).

In short, “cities are primarily focal points of power based on communication; their power reflects their accessibility — the range and quality of contacts and relationship that the city has with the rest of the world. Their communication channels, skills, and knowledge resources develop as locally based organizations extend their operations worldwide” (Knight 1989: 40). Indeed, to those firms which have international — as opposed to national, regional, or local — markets, telecommunications facilities were considered most important (Hessels 1992: 207). Principal among these is New York, which has seen a progression of firms move headquarters as well as back offices out of the city in recent years (Heenan 1991: 32-33).

The geography of corporate networks shows a persistent concentration of headquarters in large urban areas (Pred 1977; Abler 1974). This concentration remains true despite the work of Heenan (1991)

regarding corporate headquarters in small American cities. In general, the cities where such technologies are being put in place are the largest ones, where demand by large business and government customers justifies the investment (Castells, 1989: 142-151; Drennan 1989; Moss 1987).

Langdale's (1983) research on the spread of a series of improvements by both AT&T and its competitors shows convincingly that the large-city business routes, connecting markets in New York, the Boston-Washington corridor, and then to connect Chicago and Los Angeles, are the priority of telecommunications providers. Additional cities, such as Dallas and Atlanta, are also able to justify the early investment. Salomon (1988: 324-325) provides an explanation:

A key economic factor in the development of telecommunications systems is the spatial density of demand. The returns on investments are dependent on usage level more than on access rates. Therefore, suppliers prefer investments in areas where the market is big enough to generate high returns per line. This is not likely to occur in sparsely populated areas, and investments there will take place, either under regulators' requirements or under a belief by suppliers that a particular area will in the future develop to a point where demand per line will be substantial.

Hepworth (1990) has provided the most vivid illustrations of corporate telecommunications and computer networks. He finds a growing locational flexibility in production and labor processes, but this is coordinated by a centralized headquarters. Gertler (1989) comments on Hepworth's case studies: "Both cases demonstrate the importance of institutional factors in the use of computer-communication networks. Technology does not determine the nature of the network. Networking strategies were the direct expressions of corporate policy. The preexisting corporate structures biased the way questions concerning polarities of center and region and the concentration or dispersion of power were resolved" (Gertler 1989: 277). "Network firms" are able to take advantage of telecommunications technology for purchasing, manufacturing, and marketing functions, in addition to conventional control activities, such as accounting, forecasting, and planning. The development of a standardized global network allows a firm to reduce coordination costs, both internally and with other firms (Antonelli 1988).

The very cities that are the centers for face-to-face communication are also the ones which will benefit most from the spread of advanced telecommunications systems. . . Although the availability of telecommunications technologies is not a determinant of economic development, the presence of advanced telecommunications systems is a permissive factor, which can facilitate the growth of information-intensive firms. Furthermore, the absence of a sophisticated telecommunications infrastructure may act as a deterrent in attracting information-based service firms. . . The infrastructure may be built to serve existing firms, but access to sophisticated telecommunications service may stimulate new uses and users, generating even further expansion of the telecommunications infrastructure (Moss 1987: 539).

Evidence of this is found in the work of Dunning and Norman (1983) on the locational factors in office location, for multinational corporations. Ease and quality of air connections took only slight precedence over ease and quality of telecommunications in the choice of location for regional offices in Europe. These were the two most important location factors for 44 firms surveyed. Concentration in the central city is most common for banking and legal firms; engineering design firms prefer a peripheral location. Other sectors, including accounting, advertising, consulting and insurance, tend to locate in the suburbs if large, but in the central business district if their space requirements are small (Dunning and Norman 1983: 683-684).

A later study (Dunning and Norman 1987) included both “telephone and telex quality” and “telecommunication costs” among 40 factors influencing location of an overseas office of multinational companies in six sectors. Communication quality was the most important location factor for branch offices of trade and finance firms, followed closely by proximity to clients; for regional headquarters, telephone and telex quality falls just behind language, local environment or image, and airports. In no other studied sector (engineering consulting, management and business consulting, related business services, computer and information technology, and manufacturing) are these telecommunications factors rated as so influential. A recent survey by Plant Location International found that, availability and quality of telephone, fax and data lines ranked highest when it came to choosing locations for various operational functions (Schaefer 1994). Keen (1991) provides several examples of the use of telecommunications by transnational firms, as well as shortcomings if business needs are not met.

Nearly all office functions intensively utilize communications, as (increasingly) do trade and distribution operations. Telecommunications has freed firms from the need to locate near each other, instead now gathering in specialized districts and office parks. The site- and building-specific variability of telecommunications facilities prompted Hessels (1992: 43) to include this factor among eight accommodation-related location factors, but not among a list of accessibility-related factors.

The importance of knowledge-intensive activities is critical to understanding the potential role of telecommunications as a factor of production. The “advanced services sector” is especially dependent on communication links (Table 2). The number of cities whose economies are based on knowledge-intensive activities is quite small. Moss (1987), for example, illustrates the extreme concentration of offices of foreign banks in the U.S. Only 10 urban areas have more than a dozen such offices, led by New York with 405, Los Angeles with 111, and Chicago with 79. Likewise, advertising firms concentrate in four cities: New York, Los Angeles, Chicago, and San Francisco.

Table 2

Accounting firms are somewhat less concentrated, since they serve dispersed customers directly from such centers as New York, Chicago, Dallas, Houston, Philadelphia, and Washington. It is no coincidence, then, that the leading cities likely to be selected in the next five years as a location for company facilities (headquarters and offices) are Atlanta, Chicago, Dallas, New York, Washington, and Los Angeles (Fortune 1989: 28).

On a global scale, only a small number of cities actually qualify as “world cities” when economic flows are measured (Daniels 1993; Friedmann 1986; Friedmann and Wolff 1985). As Daniels (1993: 128) states it, “as the world economy has become increasingly controlled by MNEs (multinational enterprises) . . . the role of world cities has steadily become stronger.” It is relatively well-known, for example, that the global financial system is highly concentrated in the three leading international financial centers (Daniels 1993: 131-139; Sassen 1991). It is in just those three centers — London, New York, and Tokyo — that financial firms focus their internal networks and their interface with financial markets (Hepworth 1991; Langdale 1989; Warf 1989).

Coffey and Polèse (1989) cite a large number of studies which have documented centralization trends in the location of producer services. They see producer service location as a result of three factors: a pool of highly skilled labor, complementary economic activities, and the costs involved in “delivering” the “product” to the market. At the same time, “a general decentralization of business and professional services down the urban hierarchy is occurring” (O’Hualachain and Reid 1991: 267).

The decentralization of knowledge-based activities, such as research and development (R&D), has also forced firms to make use of what Howells and Wood (1993) call “information and computer technologies (ICTs).” The expansion of R&D away from central laboratories and into many locations, especially in Europe and North America, mandated greater coordination and information-sharing than traditionally had taken place. “As a result a number of multinational companies are starting to experiment with ‘cross-border teamwork’ in R&D involving research staff located at two or three different countries working on the **same** project” (Howells and Wood 1993: 46, emphasis in original). Although such activities have not yet been adopted by many firms, ICTs have the potential to offer important operational and strategic benefits to firms. “Being able to operate R&D across sites in a more interdependent interactive and simultaneous fashion opens up the possibility of achieving organisational advantages of centralisation on a decentralised geographical basis” (Howells and Wood 1993: 48). Similarly, computer-assisted design (CAD) drawings can be transferred electronically from research and engineering centers to production facilities in various locations around the world (Howells and Wood 1993: 101).

The continuing centralization of office-based activities is supported by the argument that “the greater the extent of the geographic decentralization of production activities . . . the greater the need for the centralization of key control activities” (Coffey and Polèse 1989: 19). Coffey and Polèse (1989: 20) attribute continuing regional disparities to time lags inherent in the diffusion of new

telecommunications technology. Moss (1987: 544) summarizes: “telecommunications is creating a new urban hierarchy, in which those cities that are already information-intensive are becoming even stronger as telecommunications hubs.”

It is clear that new technologies are put in place earliest in large markets, meaning large urban areas. Alles, Esparza, and Lucas (1994) provide an excellent review of the tendency for telecommunications technologies to favor large cities. They test the generality of this tendency via surveys of 121 cities in Indiana. They find that few small and medium-size cities (2,500 - 175,000 population) undertake any planning for their telecommunications infrastructure or have any interaction with the local or regional telecommunications provider. Relatively few respondents (mainly city engineers) saw the need for any more involvement with the local provider. Economic development specialists, however, have begun to see that telecommunications are “very important” to local economic development (nearly 75% overall, and all in cities with over 50,000 population). The need for telecommunications is less clear, since nearly 90% of all respondents indicated that fewer than 50% of the businesses in their communities use computer networks (Alles, Esparza, and Lucas 1994: 313). Overall, they found no clear evidence of any city-size effect, other than a tendency for firms in larger cities to use computer networks somewhat less.

Telecommunications Infrastructure as a Policy Priority

Telematics (the technologies of telecommunications, computers, and information) “are the central physical technologies of the postindustrial society” (Coates 1982: 181). Singapore, perhaps more than anywhere else, has taken on the goal of becoming an information-age city, involving not only infrastructure, but also skills and education, culture, and innovation and entrepreneurship (Corey 1993). As an objective of national policy, however, it is difficult to imagine such an organized and centralized policy in most countries. Britain, France, and Germany have grappled with the policy dilemmas raised by new telecommunications technologies (Humphreys 1991). To combat the tendency for spatial concentration, many governments have invested in telecommunications infrastructure. Ireland, for example, has successfully attracted several U.S. firms to western Ireland (rather than to the Dublin region) for data-entry and data-processing (Grimes 1993).

At the national scale, Porter (1990: 75) includes infrastructure among the factor endowments which determine national competitive advantage. Among the elements of infrastructure are the transportation system, the communications system, mail and parcel delivery, and payments or funds transfer. However, Porter (1990: 76-77) contends that these are advanced factors, along with highly educated personnel and university research institutes. More traditional basic factors include natural resources, climate, location, unskilled and semiskilled labor, and debt capital. Returns available to basic factors are low, but they remain important in extractive or agriculturally-based industries and in those where technological and skill requirements are modest and technology is widely available (Porter 1990: 77). Porter continues:

Advanced factors are now the most significant ones for competitive advantage. They are necessary to achieve higher-order competitive advantages such as differentiated

products and proprietary production technology. They are scarcer because their development demands large and often sustained investment in both human and physical capital.

However, a communications system would be classified as a generalized factor, which can be deployed in a wide range of industries, in contrast to specialized factors, specific to a single industry or a limited range of application. “Specialized factors provide more decisive and sustainable bases for competitive advantage than generalized factors. Generalized factors support only more rudimentary types of advantage” (Porter 1990: 78). He continues: “Though infrastructure is rarely a source of national competitive advantage, except highly specialized infrastructure tailored to particular industries, it can well be a disadvantage” (Porter 1990: 638). The range of issues involved in an information technology-based national growth strategy is enormous, as is the range of applications of the new technologies (Arnold and Guy 1989). The choices which countries make will have great influence on their competitive advantage in the coming decades (Cohen and Zysman 1987: 189-193).

The decentralized U.S. federal system has led to few national policies, and many local or state-based programs, such as those described by Lewyn (1994). Wilson and Teske (1990) are concerned that the decentralized approach fails to ensure compatibility across state borders. For this reason, as well as the cost of a centralized policy, Rowley and Porterfield (1992) suggest a combined approach, blending private, federal, state, and local support. For some, the Rural Electrification Administration represents a possible model that could be transferred to telecommunications (Sawhney 1993a). The policy conundrum amplifies the fact that telecommunications networks are a non-standard infrastructure, made up of juxtaposed sub-networks, based on different hardware, software, and standards (Bar et al. 1989: 52).

As an industrial recruitment inducement, several cities have included telecommunications as part of their economic development programs. However, even many of the staunchest boosters of this approach (e.g. Williams 1992) have failed to analyze telecommunications as a factor of production beyond citing the growing need for interaction and for data exchange in production processes. City governments see — correctly — that market demand configures the infrastructure, and commercial providers respond to that demand (Schmandt et al. 1990: 294-295). But some degree of public planning is needed if cities wish to develop “international city” status and the needs of telecommunications-intensive users (Schmandt et al. 1990: 300).

Plans for upgrading the country’s telecommunications infrastructure are largely internal to the regional Bell operating companies (RBOCs or Baby Bells) and to the local exchange carriers (LECs), with city and state governments playing minor roles. Market demand configures the networks and local governments have been able to assume that service would be provided (by the LEC) (Schmandt et al. 1990: 294-295). This might have been true prior to deregulation of the U.S. communication industry and the breakup of AT&T, and perhaps is why telecommunications was not a consideration in most corporate location studies. However, the situation is different in the 1990s, with

considerable variation from place to place. Deregulation immediately shifts priorities in decision-making from equity and universal service to new criteria that favor economic efficiency and profitability. Thus, it is large cities, where large firms (and large telematics customers) are found, as well as concentrations of small businesses, organization, and households. The attraction of a market size will not diminish as increasingly sophisticated technologies are developed to attract customers who can afford them. Government programs seem to be necessary to counteract the tendency for urban bias (Eskelinen 1993).

The Telecommunications-Travel Tradeoff

Perhaps the greatest controversy of telecommunications technology is the degree to which it enables firms and people to eliminate travel and face-to-face meetings, and to interact instead electronically. The situation depends crucially on the type of communication or information transferred, because the type of information determines whether firms require face-to-face contact or can substitute telephone, fax, or data transmission, as Thorngren (1970) demonstrated a quarter-century ago.

Skeptics, such as Saffo (1993) contend that even as videoconferencing catches on, “the consequence will be more business travel than ever. . . If electronic meetings could deliver the subtlety and richness of a face-to-face encounter, maybe we really could substitute screens for airplanes. . . Travel substitution is a phantom” (Saffo 1993: 112-116). Firms select

from a growing menu of communications and transportation choices. For a global team, voice telephony is perfect for spontaneous two-person conversations, E-mail and fax work well for swapping text and documents, voice mail is a good antidote to time-zone differences, and videoconferencing is just the thing for weekly meetings. These technologies do not replace face-to-face gatherings, but allow team members to keep contact and coordination ‘hot’ between the inevitable trips to one another's locations (Saffo 1993: 117).

Reinforcing this view, Thorngren (1977) found that face-to-face contacts tend to create new telephone contacts, but the reverse is not true. Nicol (1985: 195) Claims that telecommunications substitute for transportation “simply ignore the synergetic effects of improved communications on the need for face-to-face contacts that, for institutional or cultural reasons, cannot be handled on-line. The point is that better telecommunications services are likely to both encourage substitution away from transportation and induce new transportation demands” (Nicol 1985: 105; see also Brooker-Gross 1980).

Interestingly, De Meyer (1993) found that electronic communication, such as team design work, integrating a company's international R&D, was likely to be effective only if a level of confidence has been built previously through personal face-to-face contact. Moreover,

even with the best electronic communication systems, confidence between team members of a project team spread out over the globe seems to decay, even if they

have real time contacts through electronic mail . . . computer conferences, videoconferencing systems and the telephone. Confidence between engineers has perhaps, like nuclear radiation, a half-life time. Thus regular face-to-face contact seems still necessary, to boost that confidence to a level high enough to have effective team work (De Meyer 1993: 116).

Studies in London (Goddard and Pye 1977) show that the purpose of external contacts conducted face-to-face include giving and receiving advice, exchanging information, negotiations, and general discussion. By contrast, routine giving and receiving of orders and of information is more likely to be conducted by telephone. Thus, the relocation away from central cities and (CBDs) is most likely for routine office work (back offices), whose workers have few external contacts (Goddard and Pye 1977: 28). Overall, "the impact of the introduction of telecommunications on the present balance between travel cost and existing financial benefits is comparatively slight" (Goddard and Pye 1977: 27). Kinsella (1987) likewise believes that face-to-face interaction is essential for knowledge activities. Much of the argument for the essential nature of face-to-face communication is based on interpersonal trust (Granovetter 1985; Sako 1992). "Personal contacts are the medium in which communication takes place" between organizations (Laage-Hellman 1987: 177).

Moss (1987) reviews the conflicting positions on the effects of telecommunications technology on business location. On the one hand, such technology eliminates some of the need for face-to-face interaction, thus diminishing the importance of clustering in the central business district. This is especially true of financial institutions and of large firms (Kutay 1986). Ford's experience with using communications technology in product design suggests that a well-designed corporate network can reduce travel requirements (The Economist 1995a).

Rather than to attempt simply to substitute one for another, firms effectively utilize different means of communication for different purposes. Contacts by telephone are important means of communication to establish confidence and make it possible to solve problems in a short time. Electronic mail and fax are needed when the receiver is hard to reach, e.g. because of time differences. Electronic data interchange (EDI) makes it easier to perform routine orders, and mail and delivery services are still needed for larger deliveries (Lorentzon 1993). The issue of substitution is rendered meaningless by the vast number of transactions directly between communicating computers. Without telecommunications, "such interactions clearly could not exist. They neither substitute for nor complement existing forms of communication but are an entirely new form of communication with profound implications for geographical relationships" (Gillespie and Williams 1988: 1318).

Rural Regions and Telecommunications³

The research reviewed thus far provides both a positive and a negative “spin” concerning the effect of telecommunications technology for rural areas. The positive view is that greater access is provided to rural areas, thus reducing the relative concentration of communication capability in large cities. The negative view focuses on the “rural penalty” of continuing concentration of the newest and most advanced technology in large cities, combined with the presence of large corporations whose demand for telecommunications technology ensures that they will not be deprived in the near future. This section briefly examines these two positions.

The “rural penalty” stems from three factors: (1) lower population densities, (2) the distance of rural communities from urban centers, and (3) economic specialization in sectors other than information- or knowledge-intensive ones (Parker et al. 1989: 24-27). Many dismiss the first and second population density factors, citing the fact that telecommunications has effectively eliminated distance and remoteness (Cairncross 1995; O’Brien 1992; Parker et al. 1989: 34-35). Indeed, the least dense and most remote areas may benefit most from telecommunications (Parker et al. 1989: 35).

The third penalty factor is more difficult to dismiss. In general, rural areas in the U.S. and elsewhere have disproportionately low shares of producer services compared to their population (Glasmeier and Howland 1995; Grimes and Lyons 1994; O’Uallachain and Reid 1991). A significant exception to this is emerging: high-amenity counties, where a significant number of producer service firms have been founded by amenity-seeking entrepreneurs (Beyers 1994).

There are reasons for continued caution about the prospects of small communities. There is a tendency for service jobs to vanish from small towns to larger cities as branch offices of banks and insurance companies are closed (Beyers, quoted in Richards 1994: A8; Sawhney 1993b). Moreover, there is evidence that rural businesses are less skilled in management and technological issues concerning telecommunications (Parker et al. 1989: 138-139). Small firms, the economic foundation of rural non-farm economies, are not able to command the infrastructure improvements that have been provided to large firms.

Rural areas differ significantly in the degree to which small businesses are integrated into global communication networks (Gillespie, Coombes, and Raybould 1994; Sawhney 1993b). How small firms do business determines the type of communications interfaces they use in their day-to-day operations. Sawhney suggests three types of small businesses: (1) those with dispersed clientele; (2) those interfacing with large firms; and (3) those with local markets. Each of these has distinct telecommunications needs and potential problems with local service (Sawhney 1993b).

The contribution that telecommunications can make to rural economic development varies

³ The best source on this topic remains Schmandt et al. (1991).

considerably from one area to another, depending on the presence or absence of other features of the rural economy. In Scotland, regions dominated by branch plants tend to rely on intra-firm communication, whereas those with home-grown firms communicate more widely with customers, both in side and outside the region. Thus, the latter regions have developed greater local control over their telecommunications when compared with the branch-plant regions, where links are with parent firms and with a few suppliers (Gillespie, Coombes, and Raybould 1994). The situation in the U.S. is equally variable (Bernal, Stuller, and Sung 1991). The demand for rural lifestyles “is rural in location and amenities, but urban in its communication patterns. Significant development of infrastructure is necessary to support high-tech or information-intensive activities and the variety of services their employees may demand” (Salomon 1988: 325). “Remote locations, even if the most advanced telecommunications systems are available, will always be disadvantaged relative to central locations, at the very least, with regard to those activities which do require physical travel” (Salomon 1988: 325).

One suspects, then, that some rural areas in the U.S., the U.K., and elsewhere are able to serve as locations for consultants and other highly mobile professionals. These “lone eagles” (as they have been called in the U.S.) demand locations high in amenities and with relatively good access to air connections (Atchison 1993). Other locations, where low-wage labor is coupled with a high level of literacy and numeracy, will attract back-office operations. Generally, however, services should not be expected to decentralize in as widespread a manner as manufacturing did. Satellite technology allows many firms to be even more footloose and to seek out lower-wage sites with appropriate skill levels, as they have done in Ireland, the Caribbean, and elsewhere (Glasmeier and Howland 1994: 219; Howland 1993). In general, rural areas are advised not to rely on a service-sector base for their economies (Glasmeier and Borchard 1989). Further, the problems of rural labor quality are well-known and pose constraints for rural development throughout the U.S. (Rosenfeld 1992).

Leistritz (1992) suggests that this is too pessimistic. Labor-cost concerns must be balanced against other skills and traits, such as “sales ability” for telemarketing, and knowledge of medical terminology for processing medical claims. Howland (1993: 190) calls such a market niche “contextual” work, and cites library bibliographies as a data processing task that was too difficult for a firm’s Philippine contract workers to perform accurately. A second rural niche Howland identifies is that for tasks requiring quick turnaround and some sensitive government work. Offshore data entry takes at least 48 hours from the Caribbean, and at least five days from Asia, whereas rural sites in the U.S. are able to return data in 12-24 hours (Howland 1993: 189-190).

Despite these niches, Howland is not optimistic about the prospects for the rural telecommunications-based service sector. Several technological changes suggest that U.S. rural areas have perhaps ten years of competitiveness in their current market niches. These include a trend toward specialized, custom services (which rely on face-to-face contact), improvements in optical scanners (which will eliminate many data entry jobs), and point-of-transaction data entry. The data entry jobs will be either in the major urban centers where knowledge-based businesses are based, or

in offshore locations with high-skill, low-cost labor (Howland 1993).

In manufacturing, the experience of Italian industrial districts is that the incorporation of computers and telecommunications facilitates contact among local firms, with suppliers and buyers, and with world markets (Fornengo 1988; Rullani and Zanfei 1988). Networks in the U.S. are catching up slowly in creating such connections, and provide a possible model for rural development in other ways as well. In ongoing research on rural flexible manufacturing networks, no network is fully connected on a regular basis, although two methods — ACENet in Athens, Ohio, and the FlexCell Group in Columbus, Indiana — were recently awarded U.S. Department of Labor Learning Consortium grants. These will enable the networks to standardize and coordinate interaction of data and other computer-based information. In rural networks in Louisiana, in northern Minnesota, and in northwest Washington, few firms are fully computerized; simple modem connections seem rather high tech to these entrepreneurs.

Gillespie and Williams (1988) provide a useful perspective on the spatial impact of telecommunications (in addition to an insightful general review).

Although the effect of telecommunications has the potential to collapse distance rather than just to shrink it, the effect is not uniform either between different combinations of regions or between different organisations occupying the same region. . . [T]he key to understanding the significance of telecommunications is to see it within a computer network context. The computer network innovations which are redefining the basis of competitive advantage cannot be divorced from the organisations within which they are embedded. . . Although computer networks may, or may not, incorporate parts of the public telecommunications infrastructure, each computer network is essentially private and proprietary (Gillespie and Williams 1988: 1317).

Rural areas in the U.S. are at a disadvantage as the newest technologies have focused on major cities. Despite some separate fiber-optic networks, “there has been no concerted strategy for bringing fiber-optics to rural America” (Reich 1988: 6). “What you do know is that rural America will be left behind, and at a much faster rate, if it does not have better telecommunications” (P. Burgess, quoted in Parker et al. 1989: 144). Egan (1992) details the reasons for delayed investment in rural areas, principally the cost of greater “loop length” in rural areas, the need for fiber-optic facilities — as opposed to ISDN on existing copper wires — and the existence of several subnetworks (those of small telephone companies, public networks, as well as private networks) that remain not fully interconnected.

Digital switching provides significant reductions in cost for large users of toll-free 800 numbers, such as catalog retailers (Parker et al. 1989: 148-149). This technology is a prerequisite for almost all telecommunications-based businesses and is the basic technological requirement for computer

modems and fax machines. Wide variation exists across the U.S. in the availability of digital switching equipment, and analog equipment is not projected to be completely replaced until 2016 (Parker et al. 1989: 76-81). A related issue is line quality, which can prevent transmission of electronic data.

Some largely rural states have invested heavily in telecommunications, following Moss' (1987: 544) advice to recognize "the specific, and often subtle, needs of information-based industries." One of these is Nebraska, where Omaha has become a telemarketing-telecommunications center with more than 25 telemarketing and reservations systems, with more than 10,000 jobs. One of Omaha's advantages was to be one of the first intersections of the country's east-west and north-south fiber-optic lines (Kotler, Haider, and Rein 1993: 253). Omaha had an early advantage because of the presence of the Strategic Air Command and its Pentagon-quality telecommunications system (Sawhney 1992: 177). Statewide, however, the investment in fiber-optic lines and digital switches took place largely only through the prodding of local telephone companies and other businesses by state officials. An official for Iams, a pet food firm in Aurora, Nebraska, reflects on the impact of fiber-optic capability: "Ten years ago, fiber optics wouldn't have been among our top-10 reasons for opening a plant here." Now, "it's in the top three" (Richards 1994: A1). Kearney, Nebraska, is another community that has been able to capitalize on the state's telecommunications system, touting its comparative advantage over other communities (Wilson 1992). The Nebraska network also serves as social capital by providing distance learning for rural high schools and telemedicine for remote hospitals (Richards 1994). North Dakota, like Nebraska, has found telecommunications-based businesses to be an economic base equivalent to manufacturing in generating income and other benefits (Leistriz 1992).

In Wenatchee, Washington, a rural town of 18,000, producer-service firms rated quality of telecommunications system fourth among 15 location factors, the same ranking as firms in metropolitan Seattle. For rural branches or back offices, quality of telecommunications system ranked second only to proximity to customers. The net impact of telecommunications can be zero, however, as branch offices are closed, eliminating the same number of jobs created by newly-locating firms (Kirn, Conway, and Beyers 1990). More recent research by Beyers (1994) on producer services illustrates the critical nature of face-to-face contact and the growing use of telecommunications. Face-to-face is the most frequent mode of service delivery, followed by telephone and mail/courier, and fax. Computer file transfer was cited by only 58 of 406 respondent firms.

To overcome the shortcomings of rural areas, demand aggregation strategies have allowed 125 small-town telephone companies in Iowa to combine into a single point of presence for long-distance facilities. Other strategies include small firms "piggybacking" onto larger firms' nodes (Sawhney 1992: 169). Such Rural Area Networks (RANs) are among several schemes for sharing or pooling demand in rural regions (Office of Technology Assessment 1991). How telecommunications modernization should take place in rural areas is controversial. Respondents in a recent study in Nebraska and North Dakota believe that users should be involved in modernization efforts, and that

both private telephone firms and government should be involved in demand-aggregating coalitions (Allen, Johnson, and Leistritz 1993).

Does investment in telecommunications make a difference? Cronin et al. (1993) tested the effect of net investment in central office equipment and net investment in cable and wire in Pennsylvania from 1965-1991. Using county-level data, they find that investment in central office equipment causes income growth, generally with a two- to four-year lag. Variation in investment in cable and wire had no significant effect on income. Within two individual counties, their findings suggest that investment in both types of infrastructure enhance county employment. Given the chicken-and-egg nature of telecommunications and income-employment measures, Cronin et al. (1993) also tested whether economic activity causes investment in telecommunications. Their results were much weaker in this direction, especially for individual counties.

Dholakia and Harlam (1994) analyzed data for all 50 states, including telecommunications as only one of several independent variables influencing average annual pay and per capita income. Their variable for telecommunications (number of business access lines per non-farm employee) is perhaps not the best measure, but it explains 67% of the variance in average annual pay across states. When all variables are included, telecommunications remains the most important determinant of annual pay. When a five-year lag between resources and pay is modeled, telecommunications becomes the second-most important variable — behind education — in explaining interstate variations in pay.

Conclusion

This review of telecommunications has several lingering implications for those interested in rural and regional development. First, it is clear that telecommunications has been neglected in the research of most location analysts, and its significance has been raised instead by researchers in other fields. As a result regional considerations are downplayed in comparison to, for example, regulatory issues. There is much we do not know about how telecommunications varies from place to place and how it has affected locational choices and constraints. The effect seems to be something other than a world of completely footloose firms.

Second, rural areas do not suddenly become ideal locations for economic activity because they acquire state-of-the-art telecommunications facilities. The hard fact remains that no rural area has been first to obtain such a system; it is more typical to lag years behind the large urban areas where such new technologies inevitably locate first. A variety of technologies — rather than a single solution — will be needed, depending on the particular situation (Wright 1995).

Third, technological and industrial changes make it increasingly difficult to assume that rural areas will be able to keep the telecommunication-based activities that they have acquired, as the same capabilities are found in much lower-wage locations overseas. The best hope for rural America is home-grown manufacturing and service firms that address the needs of the new flexible economy, producing custom and high-quality products for many customers with turnaround times that offshore

competitors will never be able to beat. These firms will require modern and high-quality, if not quite state-of-the-art, telecommunications systems, which are to be found throughout much of rural America. Links to global networks are essential to successful firms anywhere. Telecommunications permits these links, but technology alone will not assure development in rural areas.

References

- Abler, R.F. (1974) The Geography of Communications. In M.E. Eliot Hurst, ed. Transportation Geography: Comments and Readings. New York: McGraw-Hill, pp. 327-346.
- Ady, R.M. (1994) Site Selection: Global Trends Affecting the Headquarters Locations of Business and Industry. Business Facilities 27 (5): 56-68.
- Allen, J.C., B.B. Johnson, and F.L. Leistritz (1993) Rural Economic Development Using Information Age Technology: Some Directions for Practitioners. Economic Development Review 11 (Fall): 30-33.
- Alles, P., A. Esparza, and S. Lucas (1994) Telecommunications and the Large City - Small City Divide: Evidence from Indiana. Professional Geographer 46 (3): 307-316.
- Antonelli, C. (1988) The Emergence of the Network Firm. In C. Antonelli, ed. New Information Technology and Industrial Change: The Italian Case. Dordrecht: Kluwer, pp. 13-32.
- Arnst, C., K. Kelly, and P. Burrows (1995) Phone Frenzy. Business Week February 20: 92-97.
- Arnold, E. and K. Guy (1989) Policy Options for Promoting Growth through Information Technology. Paris: Organisation for Economic Co-operation and Development, pp.133-201.
- Atchison, S. (1993) The Care and Feeding of 'Lone Eagles.' Business Week 15 November: 58.
- Bakis, H. (1987) Telecommunications and the Global Firm. In F.E.I. Hamilton, ed. Industrial Change in Advanced Economies. London: Croom Helm, pp. 130-160.
- Bar, F., M. Borrus, S. Cohen, and J. Zysman (1989) The Evolution and Growth Potential of Electronics-Based Technologies. Science Technology Industry (STI) Review 5:7-58.
- Barkley, D.L. and K.T. McNamara (1994) Manufacturers' Location Decisions: Do Surveys

- Provide Helpful Insights? International Regional Science Review 17: 23-47.
- Bernal, M.S., J. Stuller, and L. Sung (1991) Doing Business in Rural America. In J. Schmandt et al. Telecommunications and Rural Development. New York: Praeger, pp. 18-60.
- Bernard, K.E. (1992) Global Telecommunications: Policy Implications in the USA. Telecommunications Policy 16: 371-376.
- Beyers, W.B. (1994) Producer Services in Urban and Rural Areas: Contrasts in Competitiveness, Trade, and Development. Paper presented at the North American Regional Science Meetings, Niagara Falls, Ontario, November.
- Blair, J.P. and R. Premus (1987) Major Factors in Industrial Relocation: a Review. Economic Development Quarterly 1: 72-85.
- Britton, J. and M. Gertler (1986) Locational Perspectives on Policies for Innovation. In J. Dermer, ed. Competitiveness through Technology. Lexington, MA: Lexington Books, pp. 159-175.
- Brock, G.W. (1994) Telecommunication Policy for the Information Age: From Monopoly to Competition. Cambridge, MA: Harvard University Press.
- Brooker-Gross, S.R. (1980) Usages of Communication Technology and Urban Growth. In S.D. Brunn and J.O. Wheeler, eds. The American Metropolitan System: Present and Future. New York: Winston/Wiley, pp. 145-159.
- Browning, J.E. (1980) How To Select a Business Site. New York: McGraw-Hill.
- Cairncross, F. (1995) The Death of Distance: A Survey of Telecommunications. The Economist 30 September.
- Castells, M. (1989) The Informational City. Oxford: Basil Blackwell.
- Centonze, A.L. (1989) Quasi-Economic Locational Determinants of Large Foreign Headquarters: The Case of New York City. Economic Development Quarterly 3: 46-51.
- Chapman, K. and D.F. Walker (1991) Industrial Location, second edition. Oxford: Basil Blackwell.
- Coates, J.F. (1982) New Technologies and Their Urban Impact. In G. Gappert and R.V. Knight, eds. Cities in the 21st Century. Beverly Hills, CA: Sage, pp. 177-195.

- Coffee, H.E. (1994) Location Factors: Business as Usual, More or Less. Site Selection 39 (1): 34-38.
- Coffey, W.J. and M. Polèse (1989) Producer Services and Regional Development: a Policy-Oriented Perspective. Papers of the Regional Science Association 67: 13-27.
- Cohen, S.S. and J. Zysman (1987) Manufacturing Matters: The Myth of the Post-Industrial Economy. New York: Basic Books.
- Corey, K.E. (1993) Using Telecommunications and Information Technology in Planning an Information-Age City: Singapore. In H. Bakis, R. Abler, and E.M. Roche, eds. Corporate Networks, Telecommunications and Interdependence. London: Belhaven, pp. 49-76.
- Corporation for Enterprise Development (1994) The 1994 Development Report Card for the States, 8th edition. Washington: Corporation for Enterprise Development.
- Cronin, F.J., E.B. Parker, E.K. Colleran, and M.A. Gold (1993) Telecommunications Infrastructure Investment and Economic Development. Telecommunications Policy 17: 415-430.
- Czamanski, D.Z. (1981) A Contribution to the Study of Industrial Location Decisions. Environment and Planning a 13: 29-42.
- Daniels, P.W. (1993) Service Industries in the World Economy. Oxford: Blackwell.
- De Meyer, A. (1993) Management of an International Network of Industrial R&D Laboratories. R&D Management 23: 109-120.
- Dicken, P. (1992) Global Shift, second edition. New York: Guilford.
- Dixon, W. (1992) How Ford Is Building a Communications Superhighway. International Journal of Technology Management 7: 462-470.
- Dholakia, R.R. and B. Harlam (1994) Telecommunications and Economic Development: Econometric Analysis of the US Experience. Telecommunications Policy 18: 470-477.
- Drennan, M.P. (1989) Information Intensive Industries in Metropolitan Areas of the United States of America. Environment and Planning A 21: 1603-1618.
- Dunning, J.H. and G. Norman (1983) The Theory of the Multinational Enterprise: An

- Application to Multinational Office Location. Environment and Planning A 15: 675-692.
- Dunning, J.H. and G. Norman (1987) The Location Choices of Offices of International Companies. Environment and Planning A 19: 613-631.
- The Economist (1995a) Another New Model . . . January 7: 52-53.
- The Economist (1995b) Back to the Future. January 7: 54-55.
- Egan, B.L. (1992) Bringing Advanced Technology to Rural America: The Cost of Technology Adoption. Telecommunications Policy 16: 27-45.
- Erenburg, M. and R. Schuldt (1986) Location Choice in Not-for-Profit Corporations. Economic Development Review 4 (2): 16-23.
- Eskelinen, H. (1993) Rural Areas in the High-mobility Communications Society. In G. Giannopoulos and A. Gillespie (eds.) Transport and Communications Innovation in Europe. London: Pinter, pp. 259-283.
- Fine, S. (1989) Pictures Over the Wires: Telecommunications for Manufacturers. In 10th Annual Grant Thornton Manufacturing Climates Study. Chicago: Grant Thornton, p. 31.
- Forester, T. (1987) High-Tech Society. Cambridge, MA: MIT Press.
- Fornengo, G. (1988) Manufacturing Networks: Telematics in the Automotive Industry. In C. Antonelli, ed. New Information Technology and Industrial Change: The Italian Case. Dordrecht: Kluwer, pp. 33-56.
- Fortune Promotion/Site Selection (1989) Corporate Site Selection for New Facilities. New York: Time Inc.
- Friedmann, J. (1986) The World City Hypothesis. Development and Change 17: 69-83.
- Friedmann, J. and G. Wolff (1985) World City Formation: An Agenda for Research and Action. International Journal of Urban and Regional Research 6: 309-343.
- Fuchs, G. (1992) ISDN — The Telecommunications Highway for Europe after 1992? Telecommunications Policy 16: 635-645.
- Gertler, L. (1989) Telecommunication and the Changing Global Context of Urban

- Settlements. In R.V. Knight and G. Gappert, eds. Cities in a Global Society. Newbury Park, CA: Sage, pp. 272-284.
- Gibbs, D. and B. Leach (1994) Telematics in Local Economic Development: The Case of Manchester. Tijdschrift voor Economische en Sociale Geografie 85 (3): 209-223.
- Gillespie, A., M. Coombes, and S. Raybould (1994) Contribution of Telecommunications to Rural Economic Development: Variations on a Theme? Entrepreneurship and Regional Development 6 (3): 201-217.
- Gillespie, A. and H. Williams (1988) Telecommunications and the Reconstruction of Regional Comparative Advantage. Environment and Planning A 20: 1311-1321.
- Glasmeier, A. and G. Borchard (1989) Research Policy and Review 31. From Branch Plants to Back Offices: Prospects for Rural Services Growth. Environment and Planning A 21: 1565-1583.
- Glasmeier, A. and M. Howland (1994) Service-Led Rural Development: Definitions, Theories, and Empirical Evidence. International Regional Science Review 16: 197-229.
- Goddard, J.B. (1978) The Location of Non-Manufacturing Activities within Manufacturing Industries. In F.E.I. Hamilton, ed. Contemporary Industrialization. London: Longman, pp. 62-85.
- Goddard, J.B. and R. Pye (1977) Telecommunications and Office Location. Regional Studies 11: 19-30.
- Granovetter, M. (1985) Economic Action and Social Structure: The Problem of Embeddedness. American Journal of Sociology 91: 481-510.
- Grant Thornton (1989) 10th Annual Grant Thornton Manufacturing Climates Study. Chicago: Grant Thornton
- Gregg, K.M. (1992) The Status of ISDN in the USA. Telecommunications Policy 16: 425-439.
- Grimes, S. (1993) Exploring the Potential of Telecommunications: Perspectives from the European Periphery. In H. Bakis, R. Abler, and E.M. Roche, eds. Corporate Networks, Telecommunications and Interdependence. London: Belhaven, pp. 31-47.
- Grimes, S. and G. Lyons (1994) Information Technology and Rural Development: Unique

- Opportunity of Potential Threat? Entrepreneurship and Regional Development 6 (3): 219-237.
- Hack, G.D. (1992a) Back Offices Forward Company Growth. Area Development 27 (1): 134-139.
- Hack, G.D. (1992b) Telecommunications: Making the Site Selection Connection. Area Development 27 (4): 69-71.
- Hack, G.D. (1993) Locating in Rural Areas — A Growing Option. Area Development 28 (4): 22-23.
- Hagström, P. (1992) Inside the ‘Wired’ MNC. In C. Antonelli, ed. The Economics of Information Networks. Amsterdam: North-Holland, pp. 325-345.
- Hall, P. And P. Preston (1988) The Carrier Wave: New Information Technology and the Geography of Innovation 1846-2003. London: Unwin Hyman.
- Hamfelt, C. and A.K. Lindberg (1987) Technological Development and the Individual’s Contact Network. In H. Håkansson, ed. Industrial Technological Development: A Network Approach. London: Croom Helm, pp. 177-209.
- Harbaugh, B. and B. McMahan (1992) Telecommunications Takes Center Stage. Area Development 27 (4): 26-32.
- Harding, C.F. (1989) Location Choices for Research Labs: A Case Study Approach. Economic Development Quarterly 3: 223-234.
- Heenan, D.A. (1991) The New Corporate Frontier. New York: McGraw-Hill.
- Heldman, R.K. (1994) Information Telecommunication: Networks, Products, and Services. New York: McGraw-Hill.
- Heldman, R.K. (1995) The Telecommunications Information Millennium. New York: McGraw-Hill.
- Hepworth, M. (1990) Geography of the Information Economy. New York: Guilford.
- Hepworth, M. (1991) Information Technology and the Global Restructuring of Capital Markets. In S.D. Brunn and T.R. Leinbach, eds. Collapsing Space and Time. New York: Harper Collins, pp. 132-148.

- Hessels, M. (1992) Locational Dynamics of Business Services. Netherlands Geographical Studies 147. Amsterdam: Royal Dutch Geographical Society.
- Hottes, K. (1993) Submarine Cables in Our Times — Competition between Seacables and Satellites. In H. Bakis, R. Abler, and E.M. Roche, eds. Corporate Networks, Telecommunications and Interdependence. London: Belhaven, pp. 99-110.
- Howells, J. and M. Wood (1993) The Globalisation of Production and Technology. London: Belhaven.
- Howland, M. (1993) Technological Change and the Spatial Restructuring of Data Entry and Processing Services. Technological Forecasting and Social Change 43: 185-196.
- Humphreys, P. (1991) The State and Telecommunications Modernization in Britain, France and West Germany. In U. Hilpert, ed. State Policies and Techno-Industrial Innovation. London: Routledge, pp. 109-132.
- Hunker, H.L. (1979) Community Attitudes and Perceptions of Selected Manufacturers in Ohio. Research Report No. 3. Columbus: Ohio State University, Center for Real Estate Education and Research.
- Keen, P.G.W. (1991) Shaping the Future: Business Design through Information Technology. Boston: Harvard Business School Press.
- Keller, J.J., P. Engardio, K. Dreyfack, and R. Mitchell (1986) The Rewiring of America. Business Week September 15: 188-196.
- Kellerman, A. (1984) Telecommunications and the Geography of Metropolitan Areas. Progress in Human Geography 8 (2): 222-246.
- Kinsella, T.K. (1987) The Future of Downtown as a Center for Business Knowledge Activity. Economic Development Quarterly 1: 279-292.
- Kirn, T.J., R.S. Conway, and W.B. Beyers (1990) Producer Services Development and the Role of Telecommunications: A Case Study in Rural Washington. Growth and Change 21 (Fall): 33-50.
- Knight, R.V. (1982) City Development in Advanced Industrial Societies. In G. Gappert and R.V. Knight, eds. Cities in the 21st Century. Beverly Hills, CA: Sage, pp. 47-68.
- Knight, R.V. (1989) The Emergent Global Society. In R.V. Knight and G. Gappert, eds. Cities in a Global Society. Newbury Park, CA: Sage, pp. 24-43.

- Kotler, P., D.H. Haider, and I. Rein (1993) *Marketing Places*. New York: Free Press.
- Kutay, A. (1986) Effects of Telecommunications Technology on Office Location. Urban Geography 7: 243-257.
- Langdale, J.V. (1983) Competition in the United States Long Distance Telecommunications Industry. Regional Studies 17:393-409.
- Langdale, J.V. (1989) Telecommunications and International Business Telecommunications: The Role of Leased Networks, Annals of the Association of American Geographers 79: 501-522.
- Langdale, J.V. (1991) Telecommunications and International Transactions in Information Services. In S.D. Brunn and T.R. Leinbach, eds. Collapsing Space and Time. New York: Harper Collins, pp. 193-214.
- Leistritz, F.L. (1992) Telecommunications Spur North Dakota's Rural Economy. Rural Development Perspectives 8 (2): 7-11.
- Lewyn, M. (1994) The States Swing into I-way Construction. Business Week August 22: 73-74.
- Linhart, P.B., R. Radner, and R. Tewari (1992) On the Market for Data Networking Products. In C. Antonelli, ed. The Economics of Information Networks. Amsterdam: Elsevier, pp. 141-156.
- Lorentzon, S. (1993) The Use of ICT at the Plant of ABB at Ludvike and at the Plant of Volvo at Skövde in Sweden — A Regional Perspective. In H. Bakis, R. Abler, and E.M. Roche, eds. Corporate Networks, Telecommunications and Interdependence. London: Belhaven, pp. 135-160.
- Lund, L. (1979) Factors in Corporate Location Decisions (Information Bulletin number 66). New York: The Conference Board.
- Lund, L. (1986) Locating Corporate R&D Facilities (Research Report number 892). New York: The Conference Board.
- Lyne, J. (1991) Real Estate Executives Plugging Into Park Telecommunications, Capitalizing on Concessions. Site Selection 36 (6): 1208-1216.
- Mahmassani, H.S. and G.S. Toft (1985) Transportation Requirements for High Technology Industrial Development. Journal of Transportation Engineering 111: 473-484.

- Malecki, E.J. and S.L. Bradbury (1992) R&D Facilities and Professional Labour: Labour Force Dynamics in High Technology. Regional Studies 26: 123-136.
- Mansell, R. (1990) Rethinking the Telecommunications Infrastructure: The New "Black Box". Research Policy 19: 501-515.
- Mansell, R. (1994) Multinational Organizations and International Private Networks: Opportunities and Constraints. In C. Steinfield, J.M. Bauer, and L. Caby (eds.) Telecommunication in Transition: Policies, Services and Technologies in the European Community. Thousand Oaks, CA: Sage, pp. 204-222.
- Markus, M.L. (1992) Critical Mass Contingencies for Telecommunications Consumers. In C. Antonelli, ed. The Economics of Information Networks. Amsterdam: North-Holland, pp. 431-450.
- McGraw-Hill (1980) Plant Site Selection: A Survey of Business Week's Executive Subscribers in Industry. New York: McGraw-Hill.
- Miles, I. And G. Thomas (1990) The Development of New Telematics Services. Science Technology Industry (STI) Review 7: 35-63.
- Mokhtarian, P.L. and I. Salomon (1994) Modelling the Choice of Telecommuting: Setting the Context. Environment and Planning A 26 (5): 749-766.
- Moriarty, B.M. (1980) Industrial Location and Community Development. Chapel Hill: University of North Carolina Press.
- Moss, M.L. (1987) Telecommunications, World Cities, and Urban Policy. Urban Studies 24 (6): 534-546.
- Nelson, K. (1986) Labor Demand, Labor Supply and the Suburbanization of Low-Wage Office Work. In A.J. Scott and M. Storper, eds. Production, Work, Territory. Boston: Allen & Unwin, pp. 149-171.
- Netherlands Economic Institute (1993) New Location Factors for Mobile Investment in Europe: Final Report. Brussels: Commission of the European Communities.
- Nicol, L. (1985) Communications Technology: Economic and Spatial Impacts. In M. Castells, ed. High Technology, Space, and Society. Beverly Hills, CA: Sage, pp. 191-209.
- O'Brien, R. (1992) Global Financial Integration: The End of Geography. London: Pinter.

- O'hUallachain, B. and N. Reid (1991) The Location and Growth of Business and Professional Services in American Metropolitan Areas, 1976-1986. Annals of the Association of American Geographers 81: 254-270.
- Office of Technology Assessment (1991) Rural America at the Crossroads: Networking for the Future. Washington, DC: U.S. Government Printing Office.
- Parker, E.B., H.E. Hudson, D.A. Dillman, and A.D. Roscoe (1989) Rural America in the Information Age: Telecommunications Policy for Rural Development. Lanham, MD: University Press of America.
- Porter, M.E. (1990) The Competitive Advantage of Nations. New York: Free Press.
- Pred, A.R. (1977) City-Systems in Advanced Economies. London: Hutchinson.
- Premus, R. (1982) Location of High Technology Firms and Regional Economic Development. Washington, DC: U.S. Government Printing Office.
- Premus, R. (1986) High Technology and State Economic Development Strategies. In R.S. Redburn, T.F. Buss, and L.C. Ledebur, eds. Revitalizing the U.S. Economy. New York: Praeger, pp. 99-113.
- Preston, P. (1995) Competition in the Telecommunications Infrastructure: Implications for the Peripheral Regions and Small Countries of Europe. Telecommunications Policy 19: 253-271.
- Rees, J. and H.A. Stafford (1984) High-Technology Location and Regional Development: The Theoretical Base. In Office of Technology Assessment. Technology, Innovation, and Regional Economic Development. Washington, DC: U.S. Government Printing Office, pp. 97-107.
- Reich, R.B. (1988) The Rural Crisis, and What to Do About It. Economic Development Quarterly 2: 3-8.
- Richards, B. (1994) Linking Up: Many Rural Regions Are Growing Again; A Reason: Technology. Wall Street Journal November 21: A1, A8.
- Rosenfeld, S.A. (1992) Competitive Manufacturing: New Strategies for Regional Development. New Brunswick, NJ : Center for Urban Policy Research Press.
- Rowley, T.D. and S.L. Porterfield (1992) Can Telecommunications Help Rural Areas Overcome Obstacles to Development? Rural Development Perspectives 8 (2): 2-6.

- Rullani, E. And A. Zanfei (1988) Area Networks: Telematic Connections in a Traditional Textile District. In C. Antonelli, ed. New Information Technology and Industrial Change: The Italian Case. Dordrecht: Kluwer, pp. 97-113.
- Sako, M. (1992) Prices, Quality and Trust. Cambridge: Cambridge University Press.
- Salomon, I. (1988) Geographical Variations in Telecommunications Systems: The Implications for Location of Activities. Transportation 14: 311-327.
- Sassen, S. (1991) The Global City: New York, London, Tokyo. Princeton, NJ: Princeton University Press.
- Saunders, R.J., J.J. Warford, and B. Wellenius (1994) Telecommunications and Economic Development, second edition. Baltimore: Johns Hopkins University Press.
- Sawhney, H. (1992) Demand Aggregation Strategies for Rural Telephony. Telecommunications Policy 16: 167-178.
- Sawhney, H. (1993a) Circumventing the Centre: The Realities of Creating a Telecommunications Infrastructure in the USA. Telecommunications Policy 17: 504-516.
- Sawhney, H. (1993b) Rural Telephony, Small Businesses and Regional Development. Entrepreneurship and Regional Development 5: 141-154.
- Schaefer, K. (1994) Telecommunications in the European Site-Selection Process. Site Selection 39 (3): 606-608.
- Schmandt, J., F. Williams, R.H. Wilson, and S. Stover, eds. (1990) The New Urban Infrastructure: Cities and Telecommunications. New York: Praeger.
- Schmandt, J., F. Williams, R.H. Wilson, and S. Stover, eds. (1991) Telecommunications and Rural Development. New York: Praeger.
- Schmenner, R.W. (1982) Making Business Location Decisions. Englewood Cliffs, NJ: Prentice-Hall.
- Schwartz, G.G. (1994) The Local Telecommunications Market: It's Not Competitive Now; Will It Ever Be? Economic Development Quarterly 8: 235-244.
- Shove, C. (1991) Key Site Characteristics of Industrial Research and Development Laboratories. Economic Development Review 9 (4): 56-64.

- Smith, D.M. (1981) Industrial Location, second edition. New York: Wiley.
- Solomon, R.J. (1990) Broadband Communications as a Development Problem. Science Technology Industry (STI) Review 7: 65-100.
- Strover, S. (1988) Urban Telecommunication Investment. In F. Williams, ed. Measuring the Information Society. Newbury Park, CA: Sage, pp. 117-140.
- Thorngren, B. (1970) How Do Contact Systems Affect Regional Development? Environment and Planning A, C 2: 409-427.
- Thorngren, B. (1977) Silent Actors: Communication Networks for Development. In I. de Sola Pool, ed. The Social Impact of the Telephone. Cambridge, MA: MIT Press, pp. 374-385.
- Twenhafel, D., J. Horrigan, A.M. Korzick, and D. McCarty (1989) Introduction. In J. Schmandt, F. Williams, and R.H. Wilson, eds. (1989) Telecommunications Policy and Economic Development: The New State Role. New York: Praeger, pp. 1-16.
- Vaughan, R.J. (1977) The Urban Impacts of Federal Policies: Vol. 2, Economic Development. Santa Monica, CA: Rand Corporation.
- Venable, T. (1991) Business Parks Go High Tech with Advanced Telecommunications Infrastructure. Site Selection 36 (6): 1190-1204.
- Venable, T. (1993) Existing, Beefed-Up Infrastructure Lures Corporate Facilities. Site Selection 38 (4): 884-887.
- Warf, B. (1989) Telecommunications and the Globalization of Financial Services. Professional Geographer 41: 257-271.
- Wheelon, A.D. (1988) The Role of Satellite Communications in the 1990s. International Journal of Technology Management 3: 667-673.
- Williams, F. (1992) The Information Infrastructure in Technopolis: The Intelligent Network. In D.V. Gibson, G. Kozmetsky, and R.W. Smilor, eds. The Technopolis Phenomenon: Smart Cities, Fast Systems, Global Networks. Lanham, MD: Rowman & Littlefield, pp. 87-102.
- Wilson, R.H. (1992) Rural Telecommunications: A Strategy for Community Development. Policy Studies Journal 20: 289-300.

Wilson, R.H. and P.E. Teske (1990) Telecommunications and Economic Development: The State and Local Role. Economic Development Quarterly 4: 158-174.

World Bank (1994) World Development Report 1994: Infrastructure for Development. Washington: World Bank.

Wright, D. (1995) Reaching out to Remote and Rural Areas: Mobile Satellite Services and the Role of Inmarsat. Telecommunications Policy 19: 105-116.

Zall, M. (1993) Getting in Touch in the Information Age. Area Development 28 (4): 32-35.

Table 1

Historical development of telecommunications technologies

Pre-1920	1920-1950	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000
Telegraph Telephone	Telegraph Telephone Television Telex Radio Military mobile radio	Telegraph Telephone Television Radio Military mobile radio Video tape recording Cable TV Microwave links Mobile telephony	Telegraph Telephone Television Radio Military mobile radio Video tape recording Cable TV Microwave links Mobile telephony Digital communications Communications satellites	Telegraph Telephone Television Radio Military mobile radio Video tape recording Cable TV Microwave links Mobile telephony Digital communications Communications satellites Facsimile Packet switching Videotext Optical fiber Videodiscs Paging Computer-aided design (CAD) Remote sensing	Telegraph Telephone Television Radio Military mobile radio Video tape recording Cable TV Microwave links Mobile telephony Digital communications Communications satellites Facsimile Packet switching Videotext Optical fiber Videodiscs Paging Computer-aided design Remote sensing Cellular radio Private satellites Integrated service digital networks (ISDN) Personal telephones High-speed data	Telegraph Telephone Television Radio Military mobile radio Video tape recording Cable TV Microwave links Facsimile Mobile telephony Digital communications Communications satellites Facsimile Packet switching Videotext Optical fiber Videodiscs Paging Computer-aided design Remote sensing Cellular radio Private satellites Integrated service digital networks (ISDN) Personal telephones High-speed data Switched wideband services Personal mobile communications

Source: Compiled from Arnold and Guy (1989), Figure 4 and Figure 9

Table 2. Elements in the Advanced Services Sector

Industrial Corporations	Specialized Technical and Business Service Firms	Public and Not-for-Profit Organization
Corporate headquarters	Law	Federal agencies
Research and development	Engineering	State agencies
Regional offices	Accounting	Universities
Divisional offices	Finance	Music and the arts
Computer centers	Advertising	Hospitals and clinics
Training centers	Public relations	Cancer centers
	Insurance	Professional associations
	Seminars and conventions	Federal Reserve banks
	Communications	Foundations
	Airlines	Museums
	Consultants	Consulates
	Business information services	

Source: Knight (1982: 56).

Telecommunications Technology and Business Location: A Review

Comment By

David Mulkey

Department of Food and Resource Economics

University of Florida

Professor Malecki is to be commended for his effort to provide an overview of developments in the telecommunications industry and to discuss resulting implications for the location of business activity and for local and regional development. Although, in his own words, the paper is "not a comprehensive examination of telecommunications," he does an admirable job of review and synthesis of more than 150 articles related to telecommunications technology and resulting development issues.

The paper begins with a treatment of general concepts, examines telecommunications as a factor of production, and finally, of particular interest here, looks at the idea of rural areas being penalized relative to urban areas in the development of telecommunications technology and raises the issue of a concerted telecommunications policy for rural areas. Perhaps one of the more important contributions of this paper for those interested in rural development is a review of the extent to which there has literally been an explosion of communications technologies in recent years. There are now a wide variety of systems available, there appears to have been equally dramatic improvements in the quality of service available, and the importance of these improvements is increased due to the corresponding decreases in costs. Clearly, Malecki's paper supports Dillman's earlier contention that we are living in an "information age."

Also, it seems clear that the rate of development of telecommunications technology has exceeded the ability of the public sector to fully address the policy implications of changes--there seems to have been little public sector involvement in the development of current communications systems. The rate of development also seems to have exceeded the ability of the research community to fully assess the implications of changes for the location of business activity and for levels of development in particular places. Malecki notes the absence of communications considerations in a large number of location studies while, at the same time, suggesting that it may be even more important in the future as a location factor, particularly for non-manufacturing types of business activity.

Malecki's review is less heartening for those interested in rural development. As he concludes, "... rural areas do not suddenly become ideal locations for economic activity because they acquire state-of-the-art telecommunications facilities." Several points in support of this conclusion seem worth repeating.

There is clearly a marked tendency for urban areas to acquire the latest in technology first as a now

deregulated communications industry responds to the size of markets represented by urban areas. Communications technology allows the dispersion of economic activities that once required urban locations, but at the same time the tendency may be for other activities to be concentrated in a smaller number of urban locations, especially when the activities begin in such locations due to the availability of technology. Rural areas will have a difficult, if not impossible, task of overcoming scale economies associated with particular activities and the external economies associated with location in an urban or suburban location. The tendency for rural areas to be among the last to acquire newer technologies is likely to continue in the absence of some concerted policy effort at the national level.

Also, the increased globalization allowed by advanced telecommunications technology means that rural areas in the U. S. are now forced to compete with rural areas in other parts of the world. For example, Malecki notes the success of western Ireland in attracting data-entry and data-processing firms. He does raise some bright spots for rural areas in the U. S. where data-entry and data-processing tasks require both fast turn around times and high levels of English language skills. However, all the examples cited by Malecki highlight the importance of human capital investments in terms of the ability of local areas to take advantages of advancements in technology.

In conclusion, telecommunications technology offers the potential for further development in rural America. However, just as clearly, that potential may be limited by a lack of investment in the basic skills of rural people and by the lack of a consistent rural development policy at the national level to address issues related to infrastructure. Without concerted action at the national policy level, there is little chance that rural areas will participate fully in development driven by new communications technology. Also, there is the equally strong possibility that the investments that are forthcoming will be piecemeal in nature with as little thought and foresight as earlier investments in rural water systems and industrial parks.