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ABSTRACT

Texts of 12 research papers are presented in this proceedings of a 1985 conference specifically focusing on the interdependence of agriculture and rural communities. Titles of Session I papers providing information on the current situation and trends in agriculture and rural communities are "An Overview of the Nonmetro Economy and the Role of Agriculture in Nonmetro Development," "Agriculture and the Community: The Sociological Perspective," and "Rural Economies and Farming: A Synergistic Link." Session II papers addressing the impact of agricultural development on rural areas include "Natural Resource Linkages to Agricultural and Rural Development," "Part-time and Limited Resource Farms and Economic and Social Growth in Rural Areas," and "Impact of Agricultural Development on Socioeconomic Change in Rural Areas." Session III papers considering impacts of community development on agriculture are "Infrastructure and Agriculture: Interdependencies with a Focus on Local Roads in the North Central States," "Social and Institutional Infrastructure: The Relationship to Agricultural Development," and "Relationships of Nonfarm Employment to Agricultural Development." Session IV papers presenting implications and policy recommendations for rural areas include "Community Capacity Building to Take Advantage of Opportunities for Agricultural and Rural Development" and "New Policies to Take Advantage of Opportunities for Agricultural and Rural Development." The proceedings include comments on each session and comments by administrators. (NEC)

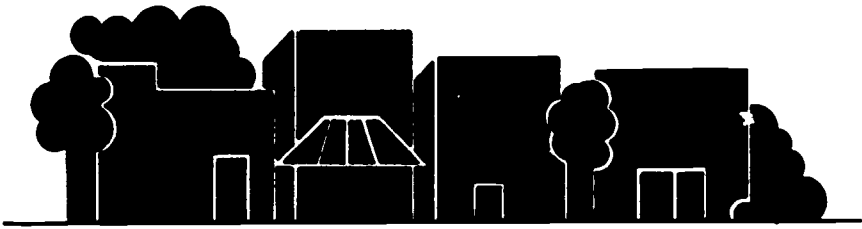
**Interdependencies of Agriculture
and Rural Communities in the
Twenty-first Century:**
The North Central Region

Conference Proceedings

Edited by Peter F. Korsching and Judith Gildner

The North Central Regional Center for Rural Development

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Foreword

Agriculture and Community Interdependencies

Peter F. Korsching

Rural America is in the midst of major social and economic changes that provide both challenges and opportunities for community, state, and national leaders, policy makers, and community and rural development professionals. These changes include the severe economic problems gripping many farmers and the decline of family-sized farms; the decline of the agricultural economic base for many counties; the need for off-farm income for an increasing number of farmers; increasing diversity in population composition and economic structure; deterioration of the basic infrastructure, especially roads and bridges; continuing pressure on the natural resource base, including uncertainty about alternative production technologies; and pressure from population change as people leave metropolitan areas and settle in rural communities. Although some of these changes reached a crisis magnitude during the last year, an undercurrent of change has been present over several years. As these problems have come to a head, so has the need to understand the nature and magnitude of the problems to develop programs of support for farmers and rural communities.

The collection of papers in this volume provide insight into the nature of the changes that are occurring in agriculture and rural communities. They are from a conference specifically focused on the interdependencies of agriculture and rural communities. Two major questions were addressed by the conference participants: What is the role of the agricultural sector in a program of rural development? How can rural development programs improve both agricultural and nonagricultural sectors of rural America? The specific objectives of the conference were:

1. Identify the available knowledge base on the interdependencies of agriculture and rural communities in rural development programs.
2. Identify problems, issues, and research opportunities in the interdependencies of agriculture and rural communities in rural development programs.
3. Establish a better knowledge base for rural development activities in agricultural areas to assist research and extension faculty with rural development projects; provide deans and directors with information for developing and structuring programs; and provide information to national level administrators.
4. Promote a sharing of ideas on rural development problems and solutions in agricultural areas between land-grant and non-land-grant sectors.
5. Develop individual state plans of action for rural development programs that capitalize on the opportunities created by agricultural and non-agricultural sector interdependencies.

Timing of the conference was fortuitous. Held mid-February 1985, it occurred about the time the farm crisis was gaining national prominence. Questions were being asked about the nature of the problem, its immediate impact

upon farms, farm families, and rural communities, and the long-range outlook for the viability of rural areas. Administrators of the land-grant institutions were receiving inquiries from clientele such as farmers, rural community residents, and public and private decision makers on a daily basis. The conference provided a forum for extension and research faculty and administrators to share ideas and information on the nature and impacts of the changes and interdependencies of agriculture and rural communities.

Richard Sauer provided an excellent overview of the changes in agriculture and rural communities and set the agenda for the conference in his keynote address, "Agriculture and the Rural Community: Opportunities and Challenges for Rural Development." Sauer stressed the growth in part-time farming, the increasing role of off-farm employment to support the farm family, and the declining, perhaps disappearing, middle-sized farms with sales ranging from \$40,000 to \$100,000. Although these changes will have impacts upon the rural communities, equally as important is the support that needs to be developed for the farming sector. Rural development must expand private sector job opportunities in rural areas and the development of farm related enterprises such as food processing plants. Rural communities can be strengthened through technical assistance for rural governments, improvement of the rural infrastructure, and research to assess the impact of deregulation of the financial industry on farming and rural communities. Sauer closed his presentation with the comment: "There are enormous challenges and opportunities ahead for our land-grant universities, for key state and federal agencies, and for various non-land-grant institutions, agencies, and organizations. How well we cooperate and coordinate our efforts will be critical to the future survival and health of rural America and, indeed, to our American society and beliefs and values we all cherish."

The main part of the conference was divided into four sessions. The first session provided background information on the current situation and trends in agricultural and rural communities. Session II addressed the impacts of agricultural development on rural communities and Session III addressed the other side of the questions: the impact of community development on agriculture. Session IV examined the implications of the changes and trends, and policy recommendations for rural areas.

Session I: Interdependencies of Agricultural Development and Rural Development

The papers in Session I provided a background on the changes and trends in agriculture and the interdependencies of the farm and nonfarm sectors of rural communities. Fred Hines, Mindy Petrulis, and Stan Daberkow in "An Overview of the Nonmetro Economy and the Role of Agriculture in Nonmetro Development," show that there has been a major decline in natural resource based industry (primarily farming), which has fallen from 45.1 percent in 1940 to a low of 9.6 percent of all industries in 1980. In such an economic environment, the viability of a community is primarily related to the creation of nonfarm jobs. In much of the north central region, especially the western plains states, farming dependent counties failed to create sufficient jobs to offset their losses in farm employment. Despite the changes, the Midwest—and especially the plains states—are still heavily dependent on farm-related activities. One of the prob-

lems of the farm sector in the Midwest is that there are weak forward linkages to the processing sector. That is, most processing in the farm sector is done outside of the region. The future prosperity of the farming dependent areas in the Midwest will be highly dependent upon increasing the linkages to local agribusiness and also attracting nonfarm industry to promote a more diversified, stable economic base.

Ron Shaffer, Priscilla Salant, and William Saupe in their paper, "Rural Economies and Farming: A Synergistic Link," suggest that rural economies are linked to farming through at least three markets. These three links are the market for both farm and nonfarm goods and services, the capital market, and the rural labor market. The goods and services market is affected by changes in rural population and income levels and changing tenure and cost structure of various industries. Nonmetro retail and service establishments have increased but there has been a decline in farm input markets. Deregulation of financial industry or changes in the capital markets can have both positive and negative impacts on the agricultural community. Finally, in relation to the rural labor markets, the farm population supplies a relatively small proportion of the total rural labor supply. The increased opportunity for nonfarm jobs and investments, therefore, will have positive distributional consequences for farm families.

In their paper entitled, "Agriculture and the Community: The Sociological Perspective," William Heffernan and Rex Campbell examine some of the same issues as the above papers, but from a sociological perspective. They examine the issues of the changing structure of agriculture on the social interaction in rural communities and also the support of local goods and services by farm operators with farms of different size and scale. Complementing the earlier papers, they suggest that agriculture is not the major source of income for most rural communities and that the average American farm family cannot maintain an adequate family income purely from farm sources. The 1982 census of agriculture data reveal that about one-half of the farm operators said farming was not their principal occupation. It seems clear that the dependency of agriculture on the nonfarm sector is especially important for the continued survival of a significant number of family farms.

Session II: Impact of Agricultural Development on Rural Areas

The primary purpose of this session was to examine the impact of agricultural change and agricultural development on the viability of rural areas. It must be understood from the outset that although the current farm crisis may result in a decline in the number of farming units, it will not result in any substantial decline in overall farm production. Therefore the impact is largely felt by the farm family and larger farming community. What we must do is estimate the social and economic consequences and costs upon the rural community. As Larry Leistritz, Donald Albrecht, Arlen Leholm, and Steve Murdock discuss in "Impact of Agricultural Development on Socioeconomic Change in Rural Areas," adequate socioeconomic theories of change that can provide explanation and understanding for periods of decline unfortunately have not been sufficiently developed. The empirical relationships between agricultural development and socioeconomic change in rural areas must be more fully analyzed to develop such theories.

Specific components of the current agricultural production system that are growing are the limited resource and the part-time farmers. Eric Holberg and Paul Lasley in their paper "Part-time and Limited Resource Farms and Economic and Social Growth in Rural Areas" suggest that these farmers are no longer transitional categories for entering or exiting agriculture, but are rather a permanent part of the agricultural structure and a potential resource for the nonmetropolitan sector. When examining the link between part-time farming and rural development, the authors argue that the appropriate unit of analysis when defining part-time farming is the farm family, especially in exploring the linkages to the community. Among part-time farmers such factors as commitment to farming and nonfarm occupation can have varying implications for the local community. On the other hand, the community itself can have an impact on part-time farmers through such institutional arrangements as local cooperatives and community based educational programs.

Regardless of the structure of future agriculture, the land base as a natural resource will always be important. In "Natural Resource Linkages to Agricultural and Rural Development," Lawrence Libby suggests that economic opportunities for many states are largely related to a natural resource base, but the direct use of natural resources to enhance economic development could impose hardships on some rural people. Society also has a stake in the decisions farmers make in relation to the use of land and water resources. "The rate of resource depletion will have important consequences for the location and structure of agriculture and therefore for the vitality of rural areas." Because of various risks, such as ground water contamination associated with farm production technologies, there is a move toward regenerative agricultural systems, which are less reliant on artificial chemical additives to the soil. Land-grant universities need to take a stronger role in formulation and implementation of economic development policies that include the use of natural resources but protect both the resources and the rural population dependent on resources.

Session III: Impacts of Community Development on Agriculture

Maintenance of a viable farm sector is based upon the goods, services, facilities, and institutions available from the local community. The infrastructure (or basic network of capital facilities) forms the foundation for an economy and includes transportation, energy, communication, utilities, water, sewer, and other public services. David Chicoine, in "Infrastructure and Agriculture: Interdependencies with a Focus on Local Roads in the North Central States," suggests that as farming has changed so has the demand on local roads. And there is currently a disequilibrium between road service demand and supply in many rural areas. Owing to the high cost of maintenance, roads and bridges have significantly deteriorated and this has increased transportation costs for marketing farm products. Some policy alternatives that exists for moving toward equilibrium include service reductions, revenue increases, and efficiency improvement. But each policy also has associated costs for certain population segments, and there are no clear answers as to the best option.

Stephen Lovejoy and Janet Ayres examine the relationship of the broader community infrastructure to agriculture in their paper, "Social and Institutional Infrastructure: The Relationship to Agricultural Development." They suggest that the community provides the social infrastructure and the basis for collective action in rural development that is aimed at the public good. For

change to occur in agriculture and in the community that will benefit both individuals and the greater local population, there must be continued interaction between those who are promoting the change, such as new agricultural technology, and those who will be using or will be impacted by the change. This type of interaction occurs mainly at the local community level, within many settings in the community. The community serves as a focal point for such interaction. Unfortunately, many of the changes occurring in agriculture and rural communities have severely reduced the local social cohesiveness. Without some community of interaction, progress in agricultural and rural development is slowed.

In his paper, "Relationships of Nonfarm Employment to Agricultural Development," Brady Deaton specifically looks at alternative approaches by state and local governments to provide nonfarm job development that can benefit the farm sector. Deaton suggests that small business development and value added enterprises linked to farming could be leading sectors to renewed economic growth and strength in rural communities. Due to the financial and leadership drain in rural areas, public support for venture capital and entrepreneurship may be required to achieve this objective, and higher education would be a principal contributor to such knowledge based economic development. Our land-grant universities should expand and strengthen their research, teaching, and extension missions to assist in achieving these ends.

Session IV: Implications and Policy Recommendations for Rural Areas

This section provides some guides for developing policies at the local, state, and national levels that will strengthen both the farm and nonfarm sectors by capitalizing on their interdependencies. Although macro trends currently dominate U.S. agriculture, Cornelia Flora and David Darling in their paper, "Community Capacity Building to Take Advantage of Opportunities for Agricultural and Rural Development," suggest that rural development through community organization provides a mechanism through which farmers and community residents can work together at the local level to ameliorate the macro trends. Programs should be based not on attracting outside industry, but rather on building the capacity of local resources. The authors discuss five factors of economic growth and relate them to agricultural communities. These are (1) increased resources both in total amount and rate of circulation within the community, (2) improved technology that can make current or new tasks more efficient and supply a comparative advantage, (3) expanded markets, (4) decreased transportation costs, and (5) creation of new institutions to facilitate more efficient or more desirable use of resources. A major requirement for local growth is the development of organizational skills and leadership to understand the relationships among these factors and to motivate the local community into action.

In "New Policies to Take Advantage of Opportunities for Agricultural and Rural Development," Luther Tweeten begins with the premise that we need new federal policies to improve the well being of rural people and that these must be placed within the context of nationwide policies to improve the well being of all people. The most pressing current economic problems in agriculture are financial stress caused by high real interest rates and excess capacity caused by high value of the dollar in international exchange. Immediate federal action is neces-

sary to bring down real interest rates by reducing federal deficits. For agriculture, changes in commodity programs would include (1) greater targeting of farm programs if we want to maintain family farms while also maintaining farm income, and (2) reduced production through a long-term program to remove land from production that is prone to erosion or irrigated from nonrenewable underground water. As an economic development scheme, Tweeten suggested a wage/earnings supplement program that would target assistance to marginal workers while relying on the market to locate jobs where costs are the lowest.

A panel of four administrators from land-grant universities within the north central region served as reactors to the conference. These administrators included Roy Arnold, Vice Chancellor of the Institute of Agriculture and Natural Resources at the University of Nebraska; Kenneth Schneeberger, Assistant Dean of the College of Agriculture and Assistant Director of the Agricultural Experiment Station at the University of Missouri; H. A. Wadsworth, Director of the Extension Service at Purdue University; and Donald Swoboda, Associate Dean and Associate Director of the Agricultural Experiment Station at the University of Nebraska. Their reactions and suggestions included developing a greater role and leadership for extension in rural development. But they also suggested that extension cannot do the job alone. More research is needed on the current crisis, especially its long-term impacts, to help extension design programs to address the needs and problems. A high priority was university assistance to businesses to help them with their technical problems, financial management, and other needs. There must be a willingness on the part of universities not only to accept change, but to be in the vanguard for creating change.

An important feature of the conference were the home state planning sessions. Each evening participants from each state met to discuss how the materials presented at the conference could be used in addressing problems related to the agricultural crisis within their own state. Each state was to develop an outline that included (1) description of state problem situation and definition of the problem to be addressed, (2) objectives to be achieved, (3) outline of the projects or activities to achieve the objectives, (4) organizational resources available within the state to achieve the objectives (other than the college of agriculture), and (5) specific roles of organizations including the college of agriculture to achieve the objectives. Some of the problems included the impact of declining property values on the tax base of rural communities; failure in generating adequate employment opportunities and the income for rural residents; substantial changes in the social and economic structure of rural areas due to the current financial crisis in agriculture and the impact on farm families, agribusiness firms, and the trade and service sector; and the economic and social problems due to loss of diversification and decline in the industrial base together with an insufficient economic base. The home state implementation plans were typed, assembled, and distributed to all participants at the conference before their departure.

Acknowledgments

Many people were involved in helping to make this conference a success. Although it is impossible to name all of them, and I am sure to miss some in the process, I would like to give recognition to the important actors who are not authors and are not otherwise acknowledged in this volume.

The first group I would like to acknowledge is the steering committee that helped formulate, develop, and organize the conference: Larry Libby, Dennis Henderson, Larry Leistritz, Lyle Schertz, Marv Konyha, Richard Stuby, Richard Sauer, Ron Shaffer, Steve Lovejoy, Tom Hady, Bill Heffernan, and Jim Hildreth. The committee hammered out the basic concepts, topics, and organization during a long meeting at Chicago's O'Hare International Airport in July 1984, and then reviewed various drafts of the program during ensuing months.

The next group I would like to acknowledge are the people who were on the program, but did not present papers. They include moderators for the four sessions: Marv Konyha, Tom Hady, Ron Powers, and Jim Hildreth; reactors for the four sessions: Dennis Henderson, Daryl Hobbs, Richard Stuby, Glen Pulver, Lyle Schertz, Roy Frederick; plus two representatives from the non-land-grant sector, Kristin Visser and Stephen Zillmer. Several reactors had prepared a written copy of their comments, and these are included in this volume.

Additional financial assistance for the conference and this publication came from the Farm Foundation; the Economic Research Service, U.S. Department of Agriculture; and the Extension Service, U.S. Department of Agriculture.

Finally, I would like to give special recognition to Rudy Stewart, who took care of all the organizational details prior to and during the conference; to Deb Novak, my secretary, whose clerical expertise and organizational abilities kept the project moving; and Teddee Grace Till, who under the severe stress of time limitations typed, duplicated, and assembled all the home state implementation plans for distribution before the end of the conference.

Chapter 1

Agriculture and the Rural Community: Opportunities and Challenges for Rural Development

Richard J. Sauer

Several changes face rural America today: the severe economic problems gripping many farmers and the decline of family-sized farms; the decline of the agricultural economic base for many counties; the need for off-farm income for an increasing number of farm families; the increasing diversity in population composition and economic structure; the deterioration of the basic infrastructure; continuing pressure on the natural resource base including uncertainty about alternative production technologies; and pressure from population change as people leave metropolitan areas.

As you know, this conference will address two questions:

- What is the role of the agricultural sector and how does it benefit from a program of rural development?
- How can rural development programs improve both the agricultural and nonagricultural sectors of rural America?

You have already heard from Pete Korsching a more detailed explanation of the purpose and objectives of the conference. It is my role to keynote this conference and especially to identify and explore the opportunities and challenges for rural development projects, activities, and programs for the following groups: (1) Research and extension faculty from land-grant universities; (2) State, regional, and national administrators from USDA; and (3) Non-land-grant representatives, such as economic and rural development groups and agencies and commodity organizations.

As we approach the conclusion of this century, we find increasing evidence that a strong agriculture depends on a strong rural community, and vice versa. Today the average farm family depends on income derived off the farm for two-thirds of its total annual earnings. We must use the resources in our state-federal, land-grant partnership, with the strong collaboration of non-land-grant agencies and organizations, to strengthen this relationship between the 5.6 million farm family members and their 54 million nonfarm neighbors because the success of one group relies on the success of the other. The interrelationships among farming, rural governments, and the business and service sectors of rural communities are critical to the economic and social health of rural America and our society in general.

In 1978 only 54 percent of all farm operators were engaged in farming as their principal occupation. About 90 of those with sales of \$40,000 or more were principally farmers. Only 22 percent of those with sales of less than \$2,500 were farmers, and nearly all the farmers in this category were 65 years old or older.

We must encourage the development of farm-related and other rural enterprises. We must also strive for improved technical and managerial assistance to rural governments and better means of coordinating local, state, and federal rural development efforts.

The Changing Structure of U.S. Agriculture

To help gain a historical perspective, let's digress to examine the changing structure of U.S. agriculture. New technology has been a major change element in this transformation. In turn, the changing structure of agricultural production is causing a change in rural communities and forcing a rethinking of the appropriate priorities and programs for the federal-state agricultural research and education system.

Farm Numbers and Size

The number of farms has declined by nearly two-thirds since 1935, while the amount of land in farms has decreased by only 1 percent (Table 1.1). The decline that began in the late 1930s has slowed dramatically since the 1950s and 1960s, but may well accelerate again in the years immediately ahead.

Table 1.1 Farm Numbers and Size

Year	Number of Farms	Land in Farms	Average Size of Farm
	Thousand	Million acres	Acres
1930	6,295	990	157
1935	6,812	1,054	155
1940	6,102	1,065	175
1950	5,648	1,202	213
1960	3,963	1,176	297
1970	2,949	1,102	374
1980	2,428	1,042	429
1981	2,434	1,042	428
1982	2,400	1,039	433
1983	2,370	1,035	437

The share of sales by the largest 5 percent of farms has gradually increased due to relative decreases in the sales of small farms as well as the growth of very large farms (Table 1.2).

Table 1.2. Sales of Largest 5 Percent of Farms as Percent of Total Sales

1939	38.3
1949	38.8
1960	41.5
1970	46.6
1980	50.6
1982	50.1

Source: ERS staff paper, "The Organization of Farming," by David H. Harrington and Alden C. Manchester, 1984.

In 1974, the only year for which data are available, concentration of production in the largest 10 percent of farms was greatest for eggs, fed cattle, potatoes, and vegetables and least for milk, soybeans, and hogs.

Specialization of Production

Increased specialization at the farm level is largely the result of the development of specialized, capital-intensive production technologies that increase the advantages of size, aided by government farm programs that reduce the need for farm diversification as a method of lessening risk. But specialization has increased for all commodities, not just those with government programs (Table 1.3).

Table 1.3. Farm Specialization: Farm Sales Derived from Primary Commodity by Type of Farm, 1969 and 1978

Type of farm	1969		1978	
	Percent of farms	Share of sales from primary commodity	Percent of farms	Percent of sales from primary commodity
Cash grain	21.3	81	24.0	85
Tobacco	5.2	80	5.8	81
Cotton	2.3	69	1.3	78
Other field crops	1.8	82	5.6	79
Vegetables	1.1	86	1.4	86
Fruits and nuts	3.1	95	3.6	96
Dairy	15.1	78	6.8	82
Poultry	3.3	94	2.1	95
Other livestock	32.8	84	41.9	87
Total	86.0		92.5	
Other farms	14.0	Less than 50	7.5	Less than 50

Source: U.S. Bureau of the Census, Census of Agriculture, 1969 and 1978.

Just as farms are becoming more specialized in producing specific commodities, they are also becoming more specialized in performing the functions required for producing and marketing agricultural commodities. Much of the work and many of the functions formerly performed on farms have shifted to nonfarm firms. Many more of the inputs that farmers use are now purchased rather than produced on the farm itself. Between 1910 and 1980, total inputs used in farming increased 19 percent. Those purchased by farmers increased 224 percent, while nonpurchased inputs—operator and family labor and inputs from land, buildings, and machinery—decreased 48 percent. Intensive use of purchased inputs has increased farmers' vulnerability to rising input prices and interruptions of input supplies.

Technology of Production

American agriculture achieved tremendous gains in productivity between 1930 and 1980. Total output rose by almost 150 percent, while total inputs increased only slightly, by 7 percent. The catalyst for the productivity gains was technological change. Mechanization, hybrids and improved varieties, commercial fertilizer, pesticides, and irrigation all enhanced the productivity of land and labor, encouraged the substitution of capital for labor, and encouraged a large outmigration of labor from agriculture. In the last two decades alone, labor use dropped by nearly half, but the share of hired labor increased. Land inputs have remained fairly constant. Current agricultural production technologies were

developed in an era of abundant, low-cost energy and chemicals. This input substitution has been a key factor behind the decreasing number and increasing size of farms for several decades.

Improved technology is seen by many as one of the major factors changing the size distribution of U.S. farms. The numbers and incomes of U.S. farms by large, medium, and small size groupings are shown in Table 1.4. The outlook is for an increasingly bimodal distribution of sizes. The large proportion of small farms is expected to continue along with a small but increasing proportion of large farms. The number and proportion of medium-sized family farms are expected to decline. The continued decline in numbers of farms involves the smaller commercial (medium-sized) farms rather than the smallest farms, which typically have sizable off-farm incomes and part-time operators.

Table 1.4. Selected Characteristics of Farms by Volume of Sales in 1981

	Large farms (Sales \$200,000 and over)	Medium farms (Sales \$40,000 to \$199,000)	Small farms (Sales under \$40,000)	All farms
Numbers				
Number of farms	112,000	582,000	1,742,000	2,436,000
(Percent of all farms)	(4.6)	(23.9)	(71.5)	(100.0)
(Percent of all sales)	(49.3)	(38.1)	(12.6)	(100.0)
Income				
	Dollars per farm			
Net income from farming	176,063	11,266	-633	10,312
Off-farm income	17,125	9,569	18,279	16,146
Total income from farm and off-farm sources	193,188	20,835	17,616	26,458
Balance sheet				
Assets, January 1	2,211,196	744,966	173,387	403,639
Debt, January 1	468,741	118,134	24,040	66,967
Equity, January 1	1,742,455	626,832	000	336,672

Source: U.S. Department of Agriculture, Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1981. ECIFS 1-1 USGPO, 1982.

Unstable Markets and Incomes

After remaining relatively stable through the 1950s and 1960s, net farm income gyrated widely in the 1970s and early 1980s. Several factors were responsible for the change.

First, because it is biologically based, farming is subject to yield and production variability caused by weather, pests, and natural hazards.

Second, U.S. crop production capacity has far outstripped the domestic market for food and fiber, making it mandatory to export the surplus. Agriculture depends on foreign markets to absorb the production of two acres out of every five. From 1950 to 1980, exports increased from 8 percent to 24 percent of gross farm income—43 percent for crops. For many agricultural exports, up to 60 percent of the world's exportable supplies have been produced in the U.S. in recent years.

However, international markets are typically thin, volatile, and subject to the vagaries of international politics and currency exchange relationships. While

the expanded markets for U.S. farm products have contributed to growth in the farm sector, they have also contributed to the instability of agricultural markets. U.S. producers and consumers have, therefore, absorbed most of the resulting variability.

Third, increasing mechanization means the farms must be larger to fully employ a farmer and his or her family—up to 80 percent larger in 1982 than in 1960. This has created pressure for farms to grow larger, driving up land prices in the 1960s and 1970s. Farmers made substantial paper returns from the increasing value of farmland—providing a basis for loans to buy more farmland and newer machinery, and for farm operation. In the 1980s farmland values have fallen at a time when the need for credit has increased for many farmers.

As farmers borrow more and their cushion of net equity increases, they are increasingly vulnerable to income swings. Over 30 percent of the largest farms have debt/asset ratios in excess of 40 percent, which could bring them to the point of forced liquidation with a few years of poor returns. Seven to 10 percent, (higher in some midwestern states) of the farms with sales over \$40,000 have debt/asset ratios in the extreme danger zone of 70 percent or more.

Farm Solvency

There are not available procedures for translating the incidence of farm debt levels into a reliable prediction of the numbers of either forced farm business foreclosures or voluntary liquidations. But a high percentage of the farm operators with a debt asset ratio of 70 percent or more are certainly vulnerable to foreclosure or voluntary liquidation.

Several recent surveys in Minnesota and in other midwestern states have asked credit agencies and farmers about expected foreclosure and liquidation rates. In Minnesota, we have estimated that 4 to 6 percent of farm operators will go out of business in 1985 and an additional 3 to 5 percent in 1986, assuming there are no major programs to prevent this from happening. Since the incidence of farm debt is heavily concentrated among full-time operators, the incidence of expected farm business failures is also concentrated among that group.

Impact on Rural Communities

Apart from the immediate effect on the individual farm families facing foreclosure and a forced change in occupation, the farm financial crisis raises the specter of substantial long-run changes in the structure of community life, particularly in our most rural areas.

For example, the Second U.S. Congressional District (southwestern Minnesota) is the most rural congressional district in the U.S. It is clear that these southwestern Minnesota counties are the locale for some of the most severe financial plights among farmers. One implication is the loss not only of individual sources of livelihood but of a structure that has been a mainstay of a way of life valued in that part of the state, and as one of the enduring models held up as socially desirable everywhere. This area stands apart in the extent to which a particular tradition of family structure and family ownership of local enterprises, farm and nonfarm, have survived. Compared with the rest of our state, these counties have the highest proportion of the work force employed in agriculture.

The current difficulties in agriculture raise the question of immediate changes in both the credit structure and farm ownership. While the precise nature of these changes cannot be completely foreseen, any major shift to outside credit and ownership in agriculture could also result in restructuring of agricultural service industries, food processing, and social services. These impacts could be severe on those communities where agriculture continues to be the principal source of employment and economic activity.

Rural Development and the American Farm

There are some 2½ million farms in this country, ranging from vegetable and dairy farms of a few acres to cattle ranches as big as some states. Annual income on these farms ranges from less than nothing to more than a million dollars. But whatever the size or the wealth or the principal product of American farms, fewer and fewer farm families rely for their income on agricultural production alone.

Dependence on off-farm income has increased rapidly during the last 25 years, rising from 42 percent of the total family farm income in 1960 to more than 60 percent today.

Studies show that farm families with annual farm sales of \$40,000 to \$100,000 earn 66 percent of their total yearly income from off-farm sources. Farm families with less than \$40,000 in annual farm sales derive essentially all of their income from sources other than farm production. Many farmers with sales of less than \$20,000 annually are deliberately and permanently part-time farmers and are virtually full-time workers elsewhere in the rural economy.

All of these figures point to new conditions in American farm life that have important implications for rural development research, education, and policy.

- Part-time farming is no longer a transitional stage during which farmers and their family members take off-farm work on their way into or out of full-time farming. Instead, such part-time farming has come to represent a permanent and important part of a stable, multi-job rural career.
- Farms with less than \$40,000 in annual sales, the group in which most of the farm families report outside jobs, comprise just over 70 percent of all farms.
- Farms with annual sales between \$40,000 and \$100,000 may be candidates for economic extinction before the decade of the 1980s is out. Farms will either be larger or smaller, as the demand of daily farm operations and the need for substantial outside income on farms of this size are increasingly incompatible.
- We must examine whether owners of large farms behave any differently in their purchasing of farm supplies and the sales of their products than smaller scale farmers. If they are more selective and more willing to go beyond local communities, this will have a significant impact on those communities.
- By the end of this decade, the share of farm family income derived from off-farm sources will significantly exceed the current amount of about two-thirds.
- Off-farm income helps stabilize total farm family income, since income from farming can fluctuate widely from year to year.
- The growing dependence of small and medium-sized farm operators on off-farm income could well reverse the trend towards specialization, providing the basis for a greater diversity of production methods and systems.

- The encouragement of more private sector job opportunities and more attractive rural investment opportunities for farmers should become a clear and urgent objective of rural development.
- The American farm and the vital rural community must move forward together. In many rural areas, one cannot succeed without the other. A strong working partnership can mean progress for both.

While the farm remains the strong foundation of rural life in America, the 1960s and the 1970s brought reduced levels of poverty and the beginnings of a broad economic diversification to rural regions. In light of the growing economic dependence of farm families on nonfarm income, this diversified economic growth in rural America must be continued and expanded.

Such expansion, of course, can help not only the part-time farmer but also the urban refugee who wishes to enjoy the pasture without owning the cow or at least without depending on the cow for any income. Millions of urban Americans have migrated in recent years from the cities to the countryside in search of cleaner air, less congestion, a simpler and less stressful life, an opportunity to create a new enterprise, or any of many other reasons.

It is extremely important that rural development means something other than simply passing over the American farm. But neither can rural development be confined to a farmer's market and a general store. A balance must be struck.

Encouragement of Farm-related Enterprises

For some farmers the ideal way to supplement farm income is to start a separate business venture that capitalizes on their immediate surroundings. Such a venture could be as simple as a roadside produce stand or as elaborate as a food processing plant. Souvenir shops and boating, fishing, swimming, camping, and hiking facilities are among the many commercial possibilities in between. Enterprises owned and operated by farmers can enhance the value of the farm and help stabilize farm income and cash flow, breaking the boom-and-bust cycle that plagues many current farm operations.

Beyond the farm, the opportunities for business development and off-farm employment in rural America are greater today than ever before. With the physical location of rural consumers as broad as that of their urban counterparts, and with the purchasing power of rural residents generally on the rise, the range of businesses that can succeed in rural America is expanding as well. Data processing—for everything from a computerized farm ledger to a regional insurance center—is only one example of a clean, high-technology industry perfectly suited to the rural environment. Financial and credit assistance will be needed to stimulate this business development.

Technical and Management Assistance for Rural Entrepreneurs

Separate from financial and credit assistance, some rural entrepreneurs need technical and management assistance to help them deal with a broad range of activities that go with running a business, i.e., preparing balance sheets, analyzing markets, establishing purchasing procedures, or developing new products. Many small town business people have had no formal management training, and they often run very small companies with no access to corporate or trade association training programs. Technical and managerial assistance is particularly important to new entrepreneurs with great ideas and

enthusiasm but little practical experience. Appropriate technical and managerial assistance could greatly enhance their chances for success.

One potential source of technical and management assistance with a traditionally rural focus and an existing grassroots network and credibility is each state's Cooperative Extension Service, since extension has a very strong history of helping farmers and local officials with their technical problems. Extension services could play a broadened and expanded role in coordinating and stimulating new small business development in rural areas, thereby helping both farmers and rural communities at the same time.

In Minnesota, this has already been proposed to the governor and to the president of the university by Wellspring—an alliance of business, education, labor, agriculture, and government dedicated to improving the total state's economic health. It is proposed that the local county extension office broaden its role into a cooperation office coordinating the generation of a regional seed capital fund and providing the educational programs in management, technology, and entrepreneurship needed for starting and succeeding in new small business ventures that would expand employment opportunities in rural areas.

Whatever the form it takes in your state, small business development and value-added enterprises linked to farming could lead to renewed economic strength in rural communities. Some public support to stimulate the generation of seed capital and to support entrepreneurs may be needed. Land-grant universities and other higher education institutions must play a key role as new knowledge will be the driving force behind this economic development.

To be successful extension would need

1. To draw upon human resources such as faculty and staff in law, management, high technology, and other areas within the university with which our traditional programs have not been strongly linked.
2. To draw upon experts in other higher education institutions.
3. To build an undergirding of applied research that could best be achieved by a parallel investment of the agricultural experiment station in research projects directed by faculty in these nontraditional units.
4. To find new financial resources. Since extension services and experiment stations have retrenched severely in recent years, it would be impossible to redirect significant current resources to small business development and still maintain the research and extension efforts critical to keeping our agriculture productive and competitive by developing and fostering the adoption of new innovative technologies.

Analysis of the Impact of Farm Policies

We have seen a growing internationalization of the world's economy. Any extrapolation into the future would suggest more of the same, perhaps at an accelerated rate. Our economy will face enormous shocks and adjustments from economic, political, and technological forces operating outside the confines of our borders. To deal with that changing world we need to understand it.

The present crisis that is plaguing us could not be a better example. U.S. agriculture is so bad off, in large part, because the value of the dollar has risen so dramatically. That rise is due to our own economic policies but also due to policies and technological changes in other countries. We must make a greater investment in policy research and analysis in attempting to understand developments in agriculture in other countries, and the economic, political, and social forces that are changing both our own society and the larger world society of which we are a part.

Many rural communities remain clearly dependent on agriculture for their economic and social health. For many others, agriculture remains a significant, if no longer dominant, economic force. In all such communities changes in agricultural policies have not only a direct effect on farming, but a "ripple" effect on other community enterprises as well. Thus, we should be analyzing the potential impact of farm policies on the nonfarm sector of the rural economy and the impact of nonfarm rural policies on the agricultural sector. While this analysis may not dictate policy decisions, it could show policymakers what the impact of the proposed policy would be. At the very least, it would highlight the interdependence of the farm and the rural economy. We have the human resources in our land-grant institutions to provide these critical analyses.

Strengthening the Rural Community

With all the natural and man-made problems that have beset the American farm in the last several years, it is heartening to discover that most rural communities had begun to thrive again in the 1970s after years of decline. However, the current financial crisis in American agriculture, especially serious in midwestern states, could turn this progress around and bring on further decline. Growing economic instability, reduced public support for the rural infrastructure, the changing system of federal income supports, and other factors threaten the economic and social gains made in the 1970s. The challenge is to sustain this growth and extend it to other rural communities that have been left behind in a way that preserves the essence of rural life—the clean environment, the rustic charm, and the friendly spirit that makes rural America attractive to so many.

Technical Assistance to Rural Governments

Local officials and people in leadership positions need technical assistance. Although many technical assistance sources already are at work in rural America, they lack coordination.

Rural Transportation

Rural America is uniquely dependent on transportation to traverse its long distances, bring its agricultural and other products to market, and connect its residents with such basic services as schools and health care. The dominant mode of transportation in modern rural America is the automobile. Public transit systems are rural rarities. Maintaining adequate rural roads and bridges is essential not only to accommodate the personal transportation requirements of rural residents but also to support such vital rural economic activities as farming, manufacturing, and retail trade. Yet there is very little definitive information on the physical and operating conditions of most rural road mileage. We can take the lead in developing methods for making comprehensive assessments of local transportation conditions and requirements.

Rural Telephone Service and the Information Revolution

By 1979, 92 percent of American households—including 89 percent of rural households—had basic telephone service. Beyond the traditional uses of telephone service, the new world of computers and advanced telecommunication services can render the rural home an "electronic cottage" capable of data processing and similar enterprises.

A series of recent changes in the telephone industry—deregulation, the breakup of the Bell System, and new rate structures—are likely to have substantial impact on rural, as well as urban, telephone systems. Therefore, an assessment of the potential effects of changes in the structure of the telephone industry in rural America is needed.

The information revolution is key to future economic change in rural (and urban) communities. It must be undergirded by human capital investments in continuing education, teaching our next generation of land-grant university graduates, research, and other areas.

Natural Resource Management

In addition to the physical and institutional infrastructure that characterize the rural community, there are natural resources that count as much and must be managed as carefully.

The forests, farmlands, and waters of rural America are a solace and economic strength for rural natives and a strong attraction to new residents. A sound conservation and natural resource policy is thus indispensable to a sound rural development policy.

Rural Financial Industry

The deregulation of the financial industry may have a major impact on farming and rural communities. For example, what's the result of a shift of local bank management control to a large multi-state holding company? Will the bank be less sensitive to the special financial needs of the rural community where the bank has a branch outlet?

Rural Families

We must also consider the family social science issues involved in changes that are occurring in rural communities. A few need greater attention in our research and education programs.

Family Management

Farm and rural nonfarm families, like urban families, are concerned about the likelihood that children and grandchildren will not experience stability and continuity as they grow into adulthood. We need to contrive and expand studies of family functioning that identify the processes that assist families through points of conflict, rapid change, and stress. How do families reorganize during major financial changes? We know far too little now.

Intergenerational differences and tension exist in many aspects of farming, including issues such as authority and control, legal transfer of property, and division of income. What part does this play in economic vulnerability and stress in farm families?

Single Parents and the Farm Enterprise

The single parent family is becoming more common in rural communities. This situation emerges out of the social trend of divorces in which individuals choose not to remarry, yet maintain parental and farming responsibilities. We need to understand how families manage and adapt to these situations and, at the same time, maintain the farm business.

Changing Sex Roles

The change of sex roles in rural families has necessitated mediation of a new discussion of labor and responsibility. This includes parenting roles as well as household productivity issues. Off-farm employment has motivated some of these role changes. Often, as women are taking on new farm management tasks or working off the farm, men are expected to take on new family work; this creates tension.

There are many other research issues regarding rural families that need attention as we attempt to assist and understand the changes to be pursued in rural development. In turn, the research results will provide the basis for revising our social service and extension education programs.

Concluding Comments

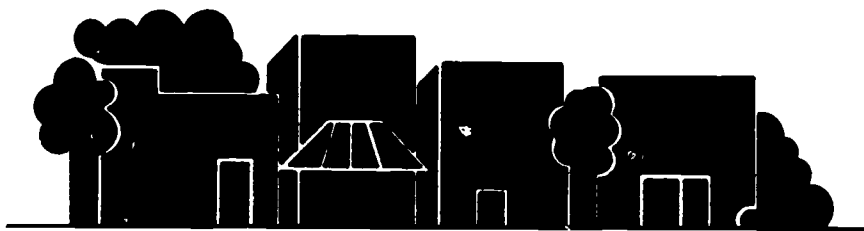
I've attempted to describe the changing structure of U.S. agriculture with a historical perspective, some of the interrelationships of rural development and the American farm, ways in which rural communities ought to be strengthened, and some important issues facing rural families. The speakers who follow will examine these and other issues in much greater detail.

There are enormous challenges and opportunities ahead for our land-grant universities, for key state and federal agencies, and for various non-land-grant institutions, agencies, and organizations. How well we cooperate and coordinate our efforts will be critical to the future survival and health of rural America and indeed to our American society and the beliefs and values we all cherish.

This conference is more than listening to a series of speakers identifying problems and suggesting courses of action. The key component is to begin development of state plans of action for coordinated and effective rural development programs that capitalize on the opportunities created by the interdependencies between the agricultural and nonagricultural sectors of our rural communities.

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Session I: Interdependencies of Agricultural Development and Rural Development

Chapter 2

An Overview of the Nonmetro Economy and the Role of Agriculture in Nonmetro Development

Fred Hines, Mindy Petrulis, and Stan Daberkow

This chapter presents a historical and current overview of the economic conditions in metropolitan and nonmetropolitan America and provides insights into the role agriculture plays in nonmetro development. The focus is on conditions in the midwestern states with special emphasis on nonmetro counties, farming-dependent counties, and eight multi-county agricultural production areas. We divide the North Central (Midwest) region into two groups of states divided by the Mississippi River: the Plains states and the Great Lakes states. The Plains and Great Lakes states are divided into metro and nonmetro counties. Metro counties are defined as those that are socially and economically integrated with a city of at least 50,000 population. Nonmetro counties are those lying outside metropolitan areas where people live in smaller towns and open country.¹ Metropolitan areas of the midwestern states range in size and economic importance from Detroit, Cleveland, Chicago, St. Louis, Milwaukee, Kansas City, and Minneapolis-St. Paul to smaller metropolitan areas such as Lincoln, Wichita, Fargo-Moorhead, and Bloomington. Nonmetro counties range from those highly dependent on farming, primarily in the Plains states, to those dependent on manufacturing, retirement income, or tourism.

We selected a group of farming-dependent counties to illustrate the dominance of farming and farm-related activities in much of the Plains and western Corn Belt, to compare the overall industrial structure of these counties with that of other county groups and to provide insights into problems associated with local economies whose economic bases are tied to farming.

We also use eight agricultural production regions in the midwestern states to study the interregional linkages between farming and the agribusiness complex, as well as linkages to the rest of the U.S. economy. The magnitude of these linkages in the eight production regions illustrates differences in: (1) the number and location of agribusiness establishments, (2) the degree to which these establishments serve farm activities within the region, and (3) the degree to which local farm output is consumed within the region.

Historical Overview

All of us are familiar with the economic history of the United States. That history records the transformation of the economy from one based largely on agriculture to one that relied more and more on manufacturing, evolving more recently to one more oriented toward the service-producing industries. For over 200 years, millions of Americans have been born to farm families or families in small farm-based communities only to find their life's work in urban, industrial centers. In 1790, according to the first official census, 19 out of every 20 Americans lived in rural areas. By 1980, about one-fourth of the population (59.4 million) lived in rural areas, but the majority of these people followed economic pursuits not directly tied to farming. In 1980, 9.4 percent of the U.S. rural

population resided on farms. These 5.6 million farm residents represented only 2.5 percent of the American population. For the Midwest the farm population comprised 4.9 percent of the total population and 16.6 percent of the rural population, indicating the importance of farming in this region.

American agriculture has played a pivotal role in the nation's economic development. Technological developments in farming have made farmers more productive, but they have also created a surplus of farm born and farm reared workers. At the same time, growth and innovations in the nonfarm sectors produced new employment opportunities for surplus farm labor. The transformation of the farm and nonfarm sectors has been interdependent and reinforcing. It is at the roots of the evolution of the U.S. economy and the current patterns of work and living of the American population.

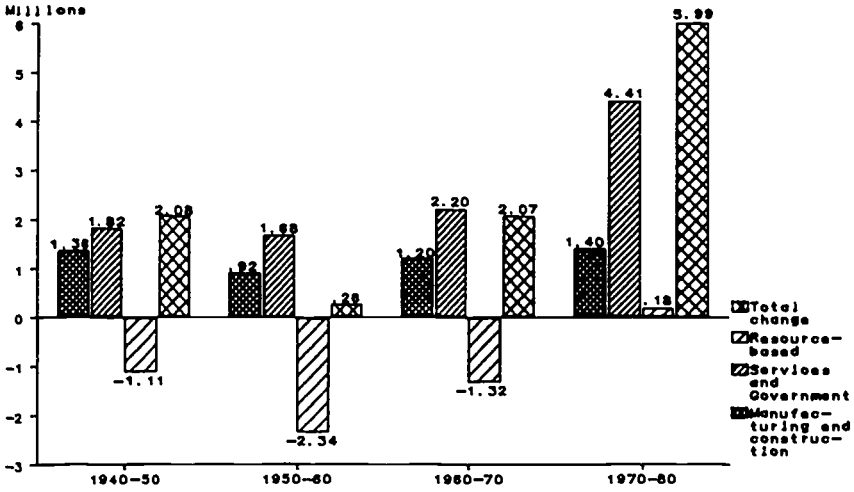
Within the historical context of this transformation of the nation as a whole, how well regions, states, and communities performed over time in providing job opportunities depended upon not only the technological transformation of their agriculture but also on the location of nonfarm opportunities for surplus farm labor. Whether a region, state, or community was to grow and remain economically viable depended largely upon its success in creating nonfarm jobs for its local farm labor surplus. It is clear that not all areas have been equally successful and that the success of individual areas has varied over time. The buildup of the large manufacturing-based cities of the Northeast and the Great Lakes states during the late 19th century and early decades of this century can be viewed as an indicator of the early successes in creating nonfarm employment opportunities. Later, scattered metropolitan areas of the Midwest, South, and West grew to compete for the surplus of labor from American farms and farm-based communities.

U.S. Nonmetro Development

Historically rural areas have experienced declining or only slowly growing employment opportunities. Between 1940 and 1970, employment increased slowly in nonmetro areas (Figure 2.1). Although many rural jobs opened up in manufacturing, construction, government, and service-producing industries, job losses in agriculture and other natural resource industries such as forestry and mining were largely offsetting. Between 1940 and 1970, nonmetro areas were simply unable to generate enough new jobs to fully absorb additions to their labor force. As a result, many rural people migrated to metro areas to find jobs. During the 1950s, U.S. nonmetro areas gained only one job in manufacturing for every three they lost in the natural resource industries. During the 1960s, gains in manufacturing were offsetting losses in the natural resource industries. By the late 1960s and early 1970s rural communities in general began to gain enough nonfarm jobs to more than offset their losses in farm employment.

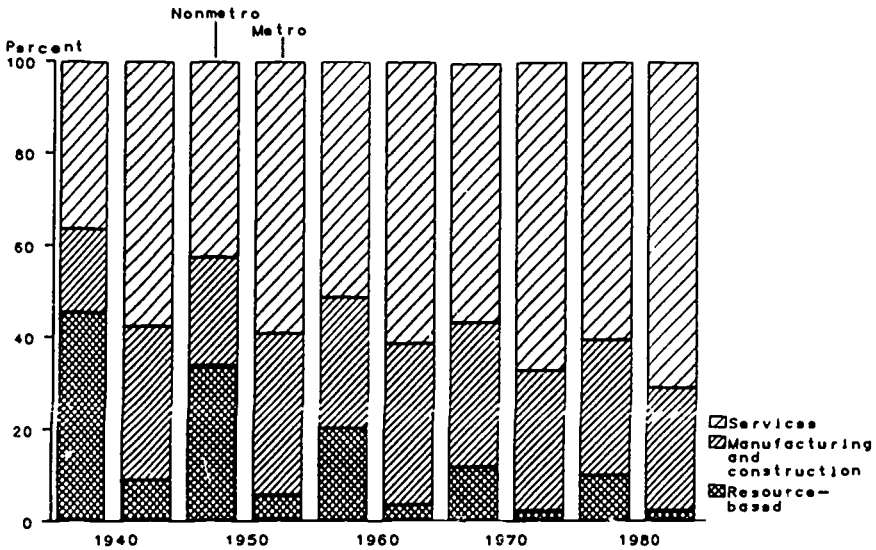
This turnaround in total employment growth resulted from growth in manufacturing and service-producing jobs in rural America. Increases during the 1970s occurred in service industries, government, manufacturing and construction, and even in the natural resource industries. Manufacturing employment continued to increase rapidly in nonmetro areas during the 1960s and 1970s while faltering in metro areas. Associated with the rapid employment growth was the well publicized revival of rural population growth. The population growth rate was higher (one-and-a-half times as high) in rural and small town communities than in metro areas during the 1970s.

Figure 2.1. Components of U.S. Nonmetro Employment Change



Source: Bureau of the Census

Figure 2.2. Industrial Distribution of Nonmetro and Metro Employment



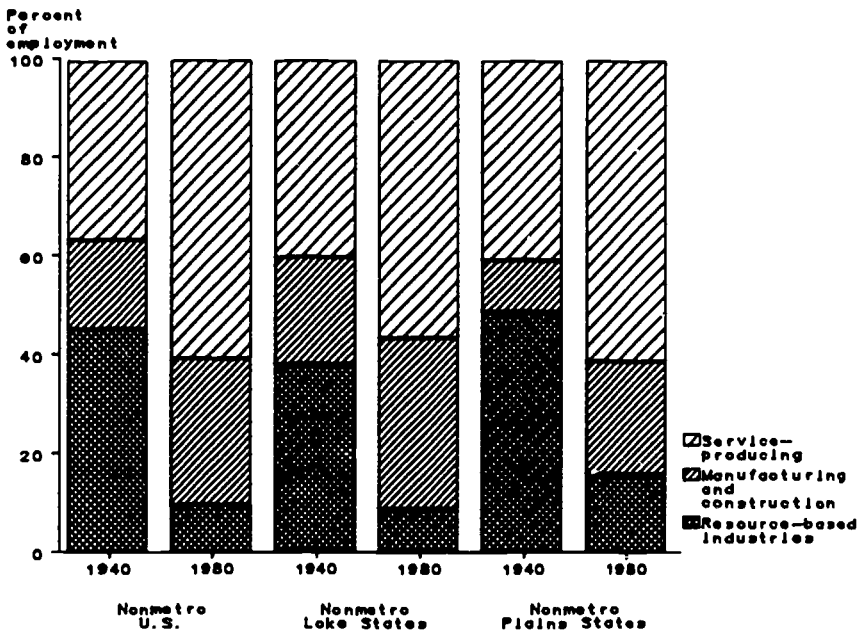
Source: Bureau of the Census

Employment increases in manufacturing, construction, and the service-producing industries and declines in agriculture over the past four decades have dramatically transformed the industrial structure of the nonmetro economy (Figure 2.2). In 1940 the natural resource industries provided more than four jobs out of every 10 in nonmetro areas; in 1980 they provided fewer than one job in 10. By 1980 the service-producing industries and manufacturing and construction had come to dominate economic activity in nonmetro areas much as they do in metro areas.

Nonmetro Areas of the Midwest

The changes in the employment base of nonmetro areas of the Midwest are similar to those illustrated for all U.S. nonmetro areas. This is particularly true of nonmetro counties in the Great Lakes states; nonmetro counties in the Plains states rely more heavily on natural resource industries for employment (Figure 2.3). In 1980, 15.8 percent of all employment in nonmetro Plains counties was in resource-based industries, in contrast to 9.6 percent in the nonmetro U.S. and 8.6 percent in nonmetro areas of the Great Lakes states. In the Great Lakes nonmetro counties over one-third of all jobs were in manufacturing and construction, whereas such jobs in the Plains states accounted for only slightly more than one-fifth of all jobs.

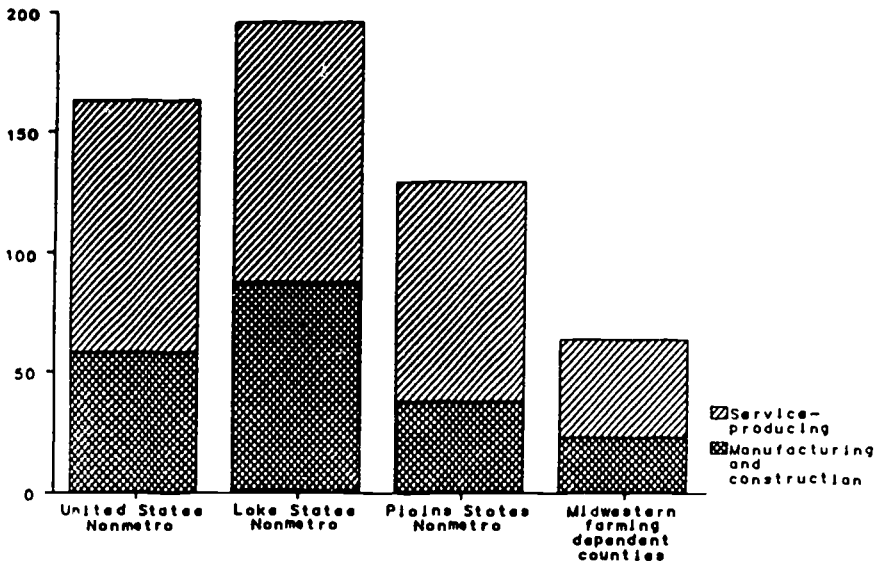
Figure 2.3. Employment Distribution, 1940 and 1980



This continued dependence on resource-based employment in the nonmetro counties of the Plains states reflects their lack of success in creating nonfarm jobs between 1950 and 1970, a period of large migration out of agriculture. In nonmetro Plains counties, for every 100 jobs lost in resource-based industries during the years 1950-1970 only 38 were gained in manufacturing and con-

struction (Figure 2.4). This job replacement ratio was much lower than for all U.S. nonmetro counties for nonmetro counties in the Great Lakes states. The success of nonmetro counties in the Great Lakes states in creating jobs in the nonfarm sectors is reflected in large changes in their employment base over the last 40 years. During the 1950 to 1970 period alone, the Great Lakes states' nonmetro counties gained almost 200 nonresource-based jobs for every 100 resource-based jobs lost.

Figure 2.4. Jobs Created in Nonresource-Based Industries Per 100 Jobs Lost in Resource-Based Industries, 1950-70



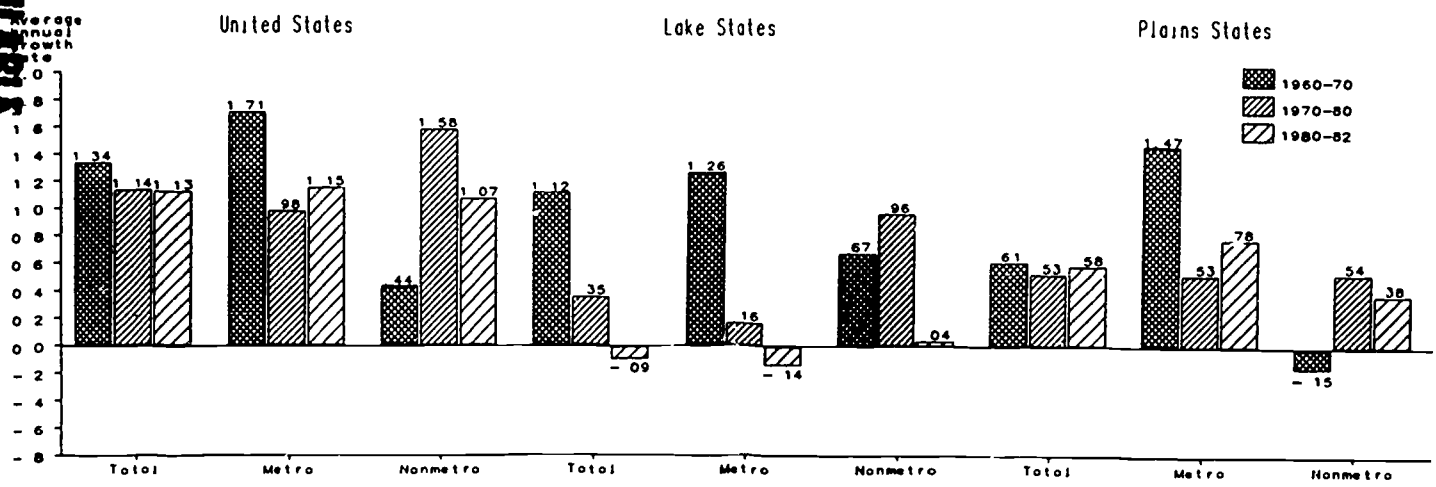
Population growth rates also reflect the differences in job creating success (Figure 2.5). During the 1960s, U.S. metro areas' growth rates were almost four times those of nonmetro areas. But during the 1970s nonmetro areas grew by 15.8 percent, compared with 9.8 percent for metro areas. Metro and nonmetro areas of the U.S. now appear to have similar rates of growth.

Population growth rates for the Great Lakes states reflect problems rooted in the older industrial heartland of the U.S. The durable manufacturing industries, long the source of employment growth and overall economic vitality of the larger and older metro areas of the Great Lakes and northeastern states, have been undergoing declines. These industries have been hard hit by the post-1979 recessions. They have faced growing foreign competition and have been especially vulnerable to high interest rates and the over-valued U.S. dollar.

Population growth in the Plains states has been fairly constant since 1960, but the growth has been unevenly distributed between metro and nonmetro areas. During the 1960s, the Plains states' metro areas outpaced the U.S. in growth while their nonmetro areas lost population. But by the early 1980s the metro-nonmetro growth differences in the region had narrowed greatly, reflecting the increasing similarity of the metro and nonmetro industrial bases and the reduced, but still important, farm employment base in nonmetro areas of the Plains.

Figure 2.5. Annual Population Growth Rates, 1960-70, 1970-80, 1980-82

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Source: Population Studies Section, Economic Development Division, ERS U.S. Department of Agriculture

These changes are mirrored in employment changes. Between 1969 and 1982, total employment in the U.S. increased 21.9 percent. Employment in the metro portion of the Great Lakes states increased only 3.9 percent during the same period, while employment growth in metro areas of the Plains followed much the same path as U.S. employment (Figure 2.6). These total growth differences can be explained in large part by relative growth in total manufacturing and durable manufacturing (Figures 2.7 and 2.8). Between 1969 and 1982, metro areas in the Great Lakes states lost about 1.1 million manufacturing jobs; over 900 thousand of these were in durable manufacturing. By contrast, manufacturing employment in the nonmetro Plains counties increased 12.8 percent, or by almost 50,000 jobs.

Figure 2.6. Index of Total Employment in the United States and the North Central States

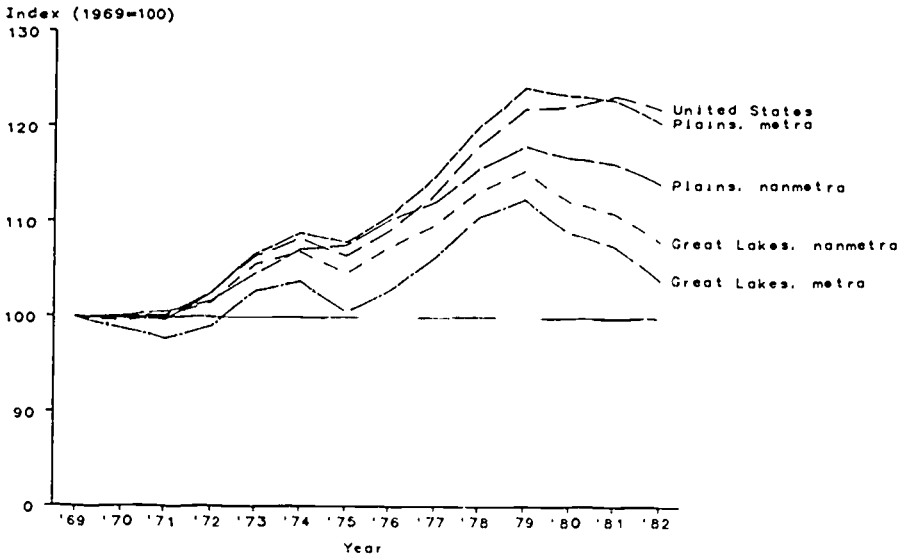


Figure 2.7 Index of Manufacturing Employment in the United States and the North Central States

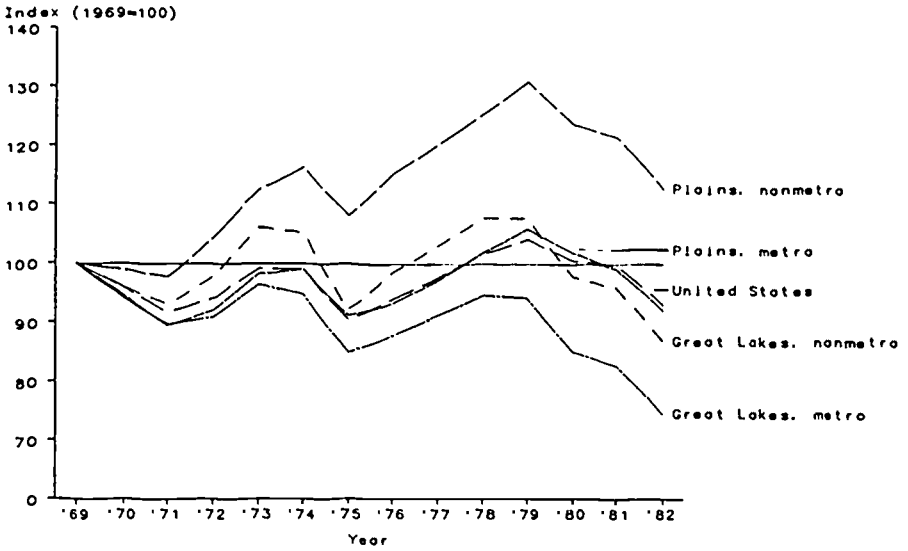
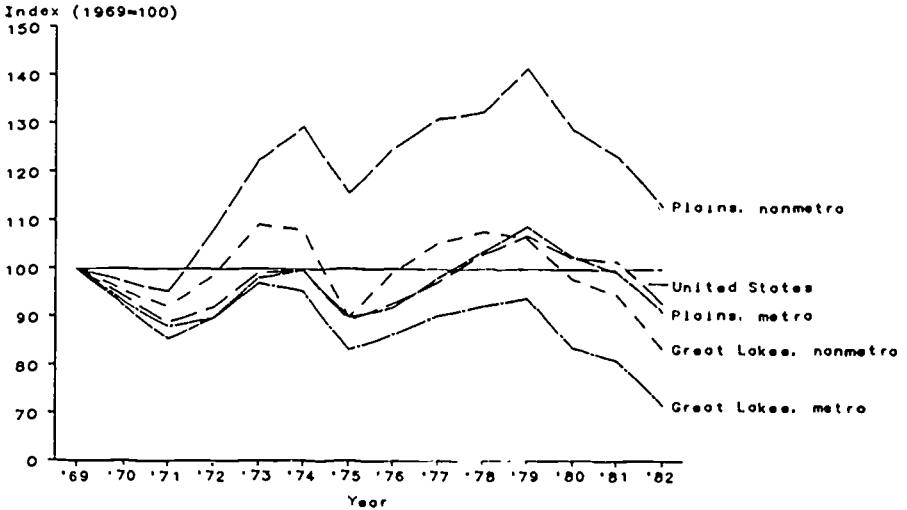


Figure 2.8. Index of Durable Manufacturing Employment in the United States and the North Central States



Agriculture's Role in Nonmetro Economic Development

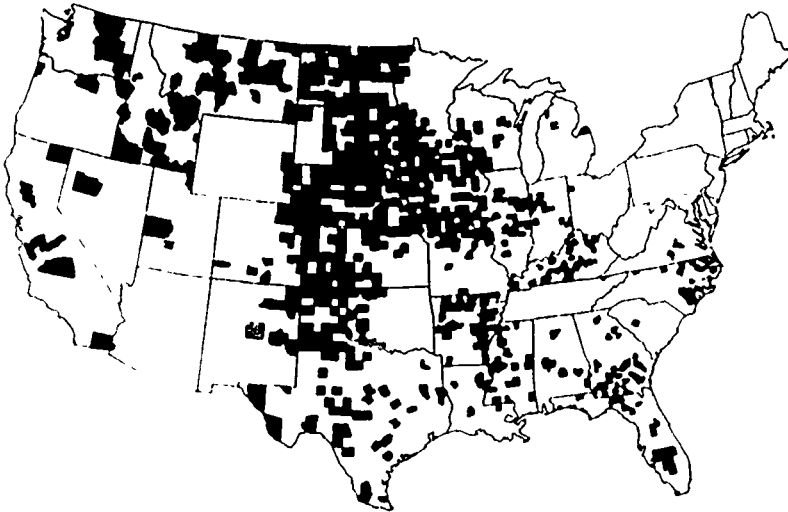
Prior to 1950, agriculture was the primary sector in the economy of rural areas. During the 1950s and early 1960s when farm employment was declining and rural nonfarm jobs were scarce, there was a net out-migration of people to urban centers to find employment. Over the last 20 years, however, nonfarm employment has expanded in most rural communities. This expansion in nonfarm jobs has helped rural areas retain their population and attract migrants from urban areas. It also has made most rural communities much less dependent on farming as their principal source of employment or income. Not only do fewer people farm today, but even farmers themselves obtain approximately 60 percent of their total income from nonfarm sources.

While only 10 percent of labor and proprietors' income in nonmetro areas comes from farming, there still are some 700 nonmetro counties (out of a total of 2,443) with a far greater direct dependence on agriculture.² In about one-third of these farming-dependent counties agriculture provides nearly 50 percent of labor and proprietors' income. Of the 700 farming-dependent counties, 312 are in the Plains states and 65 in the Great Lakes states. Clearly, communities in these counties are those that are likely to be affected by changes in the supply and demand conditions for farm products.

Farming-Dependent Counties

Farming-dependent counties account for about 30 percent of all nonmetro counties but contain only 13.4 percent of the 1980 nonmetro population. They are concentrated in the western edge of the Corn Belt and in the Plains states (Figure 2.9). Smaller concentrations can also be found in the Mississippi Delta, the southeastern Coastal Plains, and in such mountain states as eastern Washington and Idaho.

Figure 2.9. Farming-Dependent Counties



Note: Delineated by Bernal Green and Peggy Ross, EDD, ERS, U.S. Department of Agriculture. Counties are defined as those with 20 percent or more of labor and proprietary income from farming, 1975-79.

The sparsely settled farming-dependent counties averaged only 11,932 people in 1980 compared to an average of 25,613 for all nonmetro counties. Forty-six percent have no incorporated town of 2,500 or more people and almost 70 percent are not adjacent to a metro area. Farming-dependent counties have experienced high rates of population decline for decades, but these declines have tended to level off and some counties have even experienced population growth in recent years. Despite the small population size and remoteness of many farming-dependent counties, the relative size of their service sector is similar to that of all nonmetro areas, accounting for about 28 percent of labor and proprietors' income. Given the dominance of farming in these economies, their service sector probably includes an important share of agribusiness activities. Local manufacturing establishments also may provide supplies to farmers or process and market farm products. Thus, it seems likely that changes in farm conditions will have important economic repercussions outside of agriculture in the farming-dependent counties.

Impact of changes in agricultural conditions on the local nonfarm economy depends on the size of the farm sector and how closely it is linked to the nonfarm sector. The impact will be less where the role of production agriculture is small in the local economy. It will also be less where farmers typically bypass local communities to purchase inputs or household items in larger, more distant trade centers, or where farm products and livestock leave the local area before much additional processing takes place.

Linkages of Farming to Rural Areas

While we can identify farming-dependent rural areas, we know little about the geographic distribution of agriculturally-induced (secondary) impacts occurring in the agribusiness sector of rural communities. This sector includes agricultural input industries, agricultural processing industries, and food and fiber wholesaling and retailing.³ Thus, the agricultural complex includes employment in farming and in all businesses required to support the production and eventual delivery of food, clothing, shoes, and tobacco to domestic and foreign consumers (Figure 2.10). Defined this inclusively, the food and fiber system provided about 31 percent of all the civilian jobs in nonmetro areas in 1979.

Differences in Regions. The food and fiber system is a much larger part of the economy in the Plains than in the Great Lakes region. In the Plains states, agricultural production, input, and processing and marketing industries all play a greater role in providing jobs to residents of metro, nonmetro, and farming-dependent counties (Figure 2.11). For example, the food and fiber system account for about 39 percent of the jobs in the nonmetro areas of the Plains states, compared with only 29 percent in the Great Lakes states. About the same difference exists between the farming-dependent counties in the two regions. The food and fiber system accounted for 51 percent of all jobs in the farming-dependent counties of the Plains states, compared with 43 percent for the Great Lakes states.

Differences in Agricultural Production Areas. The importance of the food and fiber system varies even more among different agricultural production areas of the North Central region (Figure 2.12).⁴ In the Illinois (corn-soybeans) and Wisconsin (dairy-alfalfa-corn) production areas, agriculturally-related employment accounted only for about 25 and 22 percent of local employment, respectively (Figure 2.13). In selected production areas of the Plains states, this percentage averaged around 33, ranging from a high of approximately 41 in Minnesota (corn-soybeans) to a low of 25 in Kansas (wheat-alfalfa-soybeans).

Figure 2.10. Importance of Agriculturally-Related Employment in the Nonmetro Economy, 1979

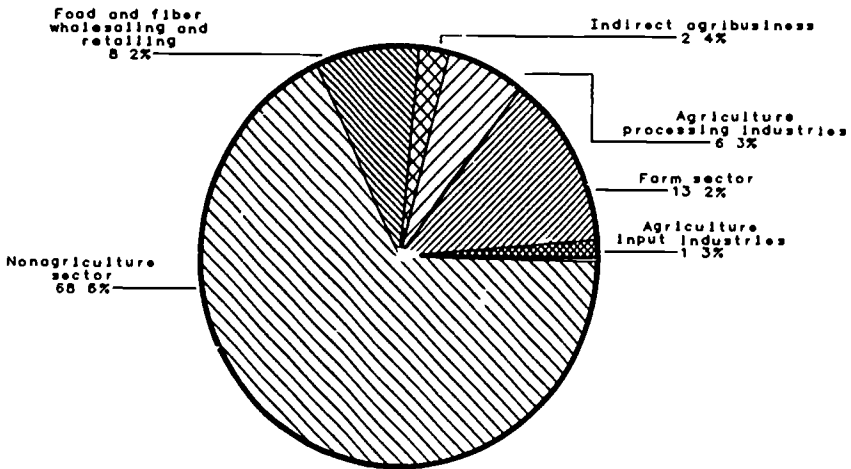
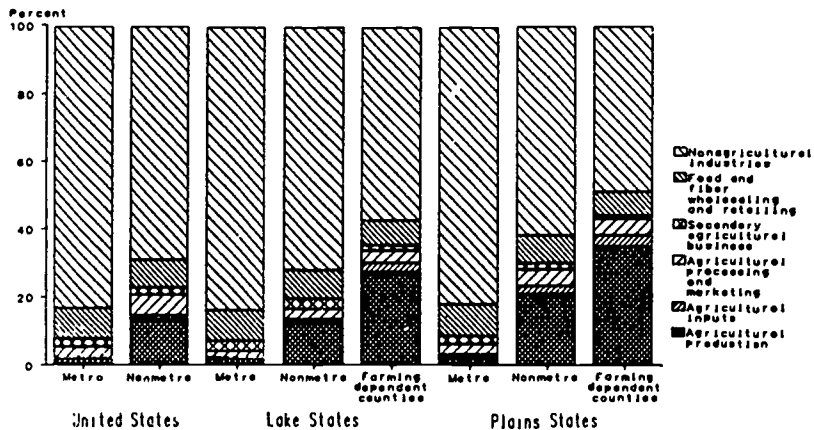


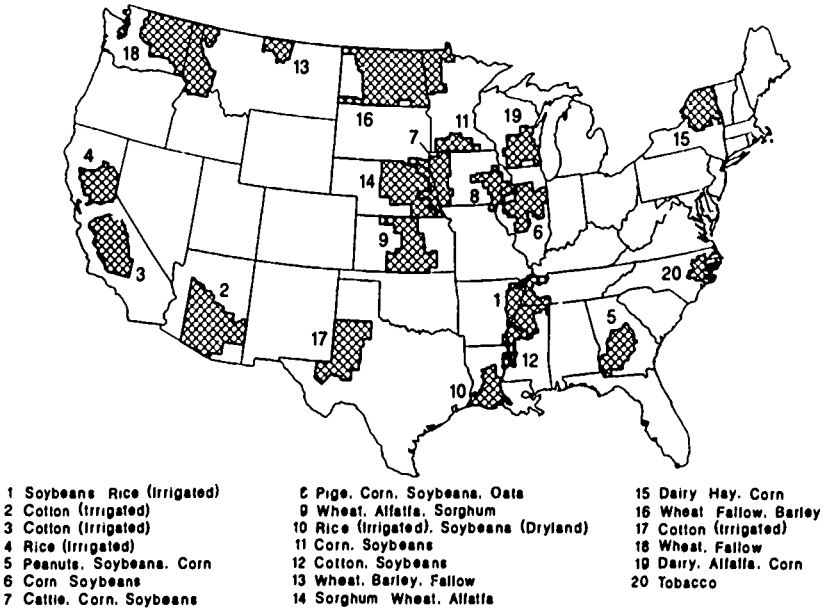
Figure 2.11. Distribution of Employment in Agriculturally-Related Industries



Agricultural production has always had strong forward linkages (i. e., food, transportation, processing, marketing) and backward linkages (i. e., purchased inputs) to the local nonfarm economy. One indicator of the importance of these linkages is the relative geographic (e. g., metro/nonmetro) distribution of farming and agribusiness jobs. For example, nationwide about 36 percent of the agricultural-related jobs in 1979 were located in nonmetro areas.⁵ Close to 70 percent of the jobs in farming (including farm proprietors), 54 percent in agricultural input industries, 39 percent in agricultural processing industries, and 22 percent in food and fiber related wholesale and retail trade were located in nonmetro counties (Figure 2.14). This distribution of farming and agricultural related employment in nonmetro areas is quite similar to that found in the Great Lakes region, but far different from that found in the nonmetro areas of the Plains states.

In the Plains states the agricultural complex plays a much greater role in the nonmetro economy. In 1979 about 63 percent of the region's agricultural-related employment was in nonmetro areas. Nonmetro counties had 89 percent of the jobs in farming, 68 percent in the agricultural input industries, and 58 percent in agricultural processing industries. Even in the food and fiber related wholesale and retail trade, and industry whose location depends mainly on population concentrations, 42 percent of the jobs were located in nonmetro areas.

Figure 2.12. Selected Agricultural Production Regions



Source: Economic Research Service, USDA

Dependence by Sector. We know that some agribusiness sectors are located close to nearby farm production while others are not. Crop service firms, prepared feed manufacturing, farm supply retailing, and raw agricultural product marketing establishments such as grain elevators and livestock auctions tend to be located near farms. Their marketing (trading) areas tend to be small.

Figure 2.13. Distribution of Employment in Agriculturally-Related Industries in Selected Agricultural-Production Regions

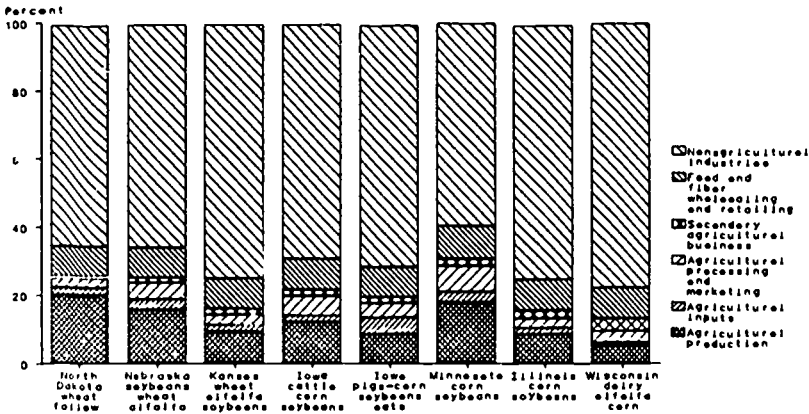
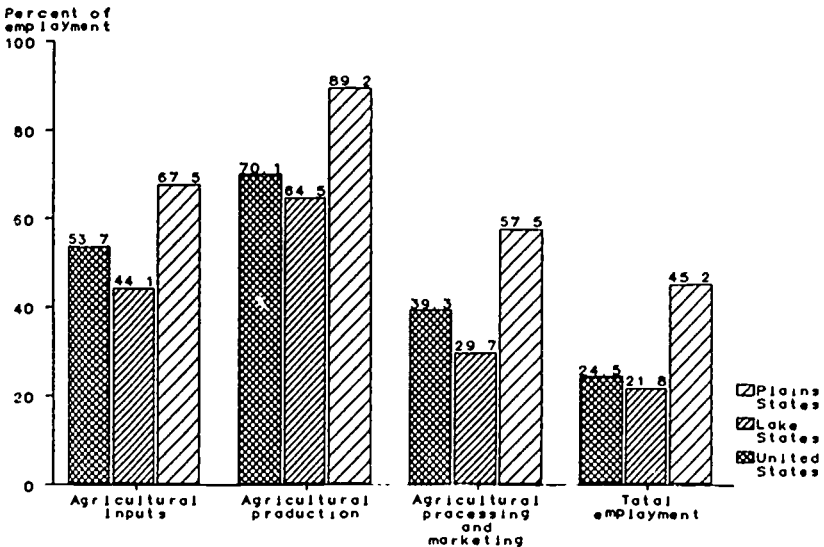


Figure 2.14. Nonmetro Areas' Share of Agriculturally-Related Employment, 1979



Agribusiness establishments—meat packing, flour milling, soybean oil mills, nitrogen fertilizer plants, and agricultural credit institutions—are also present in agricultural areas but are often located within the larger, more urban areas surrounding the agricultural production regions. Although we do not have detailed or current data that would help us determine all the specific linkages or business locations by metro or nonmetro residence or their ties to local communities, we can make some inferences from such measures as location quotients and the number of agriculturally related jobs per agricultural production worker.

Location quotients, which measure an industry's relative importance to the local or regional economy, indicate that agricultural input industries (i. e., backward linkages) play a much more important role than agricultural processing and marketing industries (i. e., forward linkages) in the various economies of the North Central states.⁶ This is true not only in the farming-dependent counties in the two regions but also in metro and nonmetro counties and in selected agricultural production areas. For example, location quotients for agricultural input industries in the farming-dependent counties (5.7 in the Plains and 5.0 in the Great Lakes states) indicate that such employment is at least five times as important for the economies in these areas as it is for the United States as a whole.⁷ On the other hand, location quotients for agricultural processing industries in the farming-dependent counties (1.3 in the Plains and 0.9 in the Great Lakes states) are about the same as the national average. Among the various agricultural production areas, location quotients for agricultural input industries range from 1.6 in Wisconsin (dairy-alfalfa-corn) to 8.3 in Iowa (pigs-corn-soybeans-oats); location quotients for agricultural processing and marketing industries range only from 0.7 in Illinois (corn-soybeans) to 1.9 in Minnesota (corn-soybeans).⁸

To sharpen the focus regarding which specific industries show the strongest linkages to local agriculture in the various production areas, we determined location quotients for specific farming-related industries (Table 2.1).⁹ It is apparent that most agricultural input industries are heavily concentrated in these areas. The farm machinery industry is an extreme example, with location quotients ranging from about 4 in Wisconsin (dairy-alfalfa-corn) to more than 26 in Iowa (pigs-corn-soybeans-oats). Although some of the processing and marketing industries are also concentrated in some of the selected agricultural production areas, such as meat products in Minnesota (corn-soybeans), grain mill products in Iowa (pigs-corn-soybeans-oats), or sugar and confectionery products in North Dakota (wheat-fallow), in most cases the processing and marketing industries are underrepresented in the local agricultural economies of the Plains and Great Lakes regions.

The calculation of the number of nonfarm workers in agribusiness industries and in industries wholesaling and retailing farm products per 100 farm workers is used to provide another view of farm-nonfarm interdependencies. Although these rough measures are not offered as the final linkage estimates, they do imply a framework for studying relative local, regional, and national multipliers stemming from farm, export-based activities (Table 2.2). The total linkage estimate is a function of (1) the proximity of agricultural input suppliers and agricultural processing and marketing establishments to local farming operations, (2) the amount of agribusiness services or functions exported to other regions, and (3) the location of final markets for food and fiber. Thus, in

Table 2.1. Location Quotients of Agriculturally-Related Industries in Selected Agricultural Production Regions, North Central States, 1979

Industry	North Dakota wheat fallow	Nebraska soybeans wheat alfalfa	Kansas wheat alfalfa soybeans	Iowa cattle corn soybeans	Iowa pigs-corn soybeans oats	Minnesota corn soybeans	Illinois corn soybeans	Wisconsin dairy alfalfa corn
Agricultural production, total	4.3	3.4	2.0	2.6	1.8	3.9	1.8	1.1
Agricultural inputs								
Chemical and fertilizer mining	—	—	1.2	.4	—	—	—	—
Chemical manufacturing	.4	1.3	—	2.4	1.5	—	3.0	.4
Farming machinery manufacturing	5.4	10.7	8.1	5.0	26.5	10.4	4.4	3.9
Warehousing	1.5	1.9	1.1	3.6	1.7	3.9	1.0	.7
Farm supplies & wholesaling	4.7	4.9	1.9	3.8	3.2	5.4	3.5	1.3
Farm credit	3.3	3.9	3.7	4.9	1.2	4.3	1.3	.6
Total	3.8	5.5	3.2	3.3	8.3	5.3	3.3	1.6
Agricultural processing								
Meat products	.4	5.2	3.2	7.8	4.2	11.9	.6	1.9
Dairy products	2.4	1.2	1.1	1.1	.7	4.2	2.7	2.6
Fruit and vegetable products	.9	.5	1.2	.7	.8	4.1	.3	1.2
Grain mill products	1.2	4.4	3.3	4.4	11.2	3.0	3.8	.8
Bakery products	.9	.3	.9	1.6	1.1	—	.7	1.2
Sugar and confectionery products	8.5	2.7	—	—	.6	1.1	.7	1.0
Fats and oils	—	2.4	.9	2.9	1.5	6.4	5.5	.4
Beverages	.6	.5	.8	.9	.6	1.1	1.8	3.1
Miscellaneous foods	.5	.7	.5	1.1	.8	.5	.3	.7
Total	.8	1.3	.8	1.5	1.1	1.9	.7	.9
Tobacco	—	—	—	—	—	—	—	—
Apparel and textiles	.1	.2	.1	.3	.1	.1	.1	.3
Leather	—	—	—	.1	—	—	.1	1.5
Raw farm products marketing	6.6	8.0	5.7	5.7	3.4	6.3	4.2	.5

Less than 0.05.

ERIC in 50 employees.

areas where farm production activities are closely tied to nearby agribusiness firms or where the local population consumes a large share of local farm production, farm production activities are highly linked to the local economy. On the other hand, local or regional economies where farmers deal largely with outside agribusiness firms and/or where most of the farm production is exported to be consumed elsewhere have a farm sector that is loosely linked to the local economy and that therefore provides few nonfarm jobs to local residents.

For every 100 farm workers in the U.S. economy, there were about 275 nonfarm workers who depended upon farm production for their jobs. Most of these jobs (196) were in the food and fiber wholesaling and retailing sectors, which include grocery stores, restaurants, and food warehousing firms, while 67 jobs were in food and fiber processing and only 12 were in agricultural input industries. In other words, for every farm worker there are nearly three related nonfarm workers, of which two are employed in industries wholesaling and retailing food and fiber.

For the Great Lakes states agricultural linkages roughly approximate those of the U.S. But for the Plains states, total linkages are only about half the U.S. figure. While the farm input industries have slightly stronger linkages in the Plains states, processing industry linkages are only about half the U.S. level, and linkages to food and fiber consumption are roughly one-third the U.S. figure. The weak forward agribusiness linkages for the Plains states indicate that either a large share of agricultural production of these states is exported (to other regions or countries) for processing and further marketing or that the farm products of the Plains do not require as much processing as most other farm products. Both factors probably play important roles in the U.S.-Plains states difference in forward (agribusiness) linkages. Differences in final consumption linkages have an obvious explanation. Most of the farm products of the Plains region are consumed in other regions.

For the agricultural production areas, the linkage estimates of course reflect the location quotients of Table 2.1 as well as the size of the population base within each region. Total linkages range from a low of 71 for the sparsely settled, grain-exporting North Dakota wheat region to a high of 272 in the Wisconsin dairy area, which has not only strong forward and backward agribusiness linkages but also a large population base providing a substantial local market for locally processed farm products. The range and variability of the linkage number again demonstrate the diversity found in agriculture-dependent economies.

The leakage estimates of Table 2.3 further elaborate farm-nonfarm interdependencies. They represent the regional figures of Table 2.2 subtracted from the U.S. figures and therefore give a very rough indication of the importation or exportation of activities or functions related to farming for each area. If we make the "heroic" assumption that interindustry and interregional linkages in U.S. agriculture apply equally well to the various agricultural production regions, these calculations suggest that the Great Lakes states are net importers (7 percent) of farm related functions, whereas the Plains are net exporters (49 percent) of jobs created by their farm production. Among farm production regions, 74 percent of the jobs associated with farm production in the North Dakota wheat region accrue to areas outside the region. At the other extreme, the Wisconsin dairy region closely mirrors the U.S. pattern. Again, we emphasize that the underlying assumptions in this type of analysis are heroic and the specific numbers should not be given much credence. The relative magnitudes are suggestive, however.

Table 2.2. Agricultural Employment Linkages in Selected Agricultural Production Regions, 1979

Agricultural production regions	Agribusiness linkages			Final consumption linkages	Total linkages
	Input industries (backward linkages)	Processing and marketing industries (forward linkages)	Total agribusiness linkages	Food and fiber wholesaling and retailing (forward linkages)	
	Workers per 100 agricultural production workers				
United States, total	12	67	79	196	275
Lake States, total	18	53	71	224	295
Plains States, total	17	32	49	91	140
Agricultural production regions					
North Dakota: Wheat	12	15	27	44	71
Nebraska: Soybeans-wheat-alfalfa	21	31	52	57	109
Kansas: Wheat-alfalfa-soybeans	21	35	56	98	154
Iowa: Cattle-corn-soybeans	17	49	66	78	144
Iowa: Pigs-corn-soybeans-oats	59	53	112	105	217
Minnesota: Corn-soybeans	18	43	61	54	115
Illinois: Corn-soybeans	24	34	58	108	166
Wisconsin: Dairy-alfalfa-corn	20	70	90	182	272

Table 2.3. Local Leakages of Agriculturally-Related Employment in Selected Agricultural Production Regions, 1979

Agricultural production regions	Agribusiness leakages			Final consumption leakages	Total leakages	
	Input industries (backward leakages)	Processing and marketing industries (forward leakages)	Total agribusiness leakages	Food and fiber wholesaling and retailing (forward leakages)	Number	Percent of all agricultural-related employment
	Workers per 100 agricultural production workers					
United States, total	0	0	0	0	0	0
Lake States, total	+6	-14	-8	+28	20	+7
Plains States, total	+5	-35	-30	-105	-135	-49
Agricultural production regions						
North Dakota: Wheat	0	-52	-52	-152	-204	-74
Nebraska: Soybeans-wheat-alfalfa	+9	-36	-27	-139	-166	-60
Kansas: Wheat-alfalfa-soybeans	+9	-32	-23	-98	-121	-44
Iowa: Cattle-corn-soybeans	+5	-18	-13	-118	-131	-48
Iowa: Pigs-corn-soybeans-oats	+47	-14	+33	-91	-58	-21
Minnesota: Corn-soybeans	+6	-24	-18	-142	-160	-58
Illinois: Corn-soybeans	+12	-33	-21	-88	-109	-40
Wisconsin: Dairy-alfalfa-corn	+8	+3	+11	-14	-3	-1

Conclusions

During the past 30 years rural America as a whole has become more diversified, significantly reducing its overall vulnerability to changes in natural resource markets, prices, and farm policies. For most rural citizens, their economic futures are more tied to overall national growth than to any one sector's success or failure. But this is not the case for farming-dependent counties or for those individuals elsewhere whose economic fortunes are directly tied to agriculture.

The transition of agriculturally-dependent communities to a more diversified economy will be difficult at best. It is made difficult by the small population of the farming-dependent counties, their geographic concentration in areas distant from most major urban markets, and the history of population decline that has left them with a relatively dependent population structure (a high proportion of young and elderly residents).

The potential consequences of resource adjustment in the farming-dependent areas of the North Central region are affected by many factors. For farmers, many of the factors are outside of their control: climate, soil type, or industrial structure. Similarly, rural communities with high dependence on farming will have many specialized human and business assets that have limited use elsewhere in the economy. It is likely that the adjustment would be most severe among residents of these several hundred specialized farming areas, highly concentrated in the Plains, yet sparsely populated.

Given the importance of the agribusiness complex to the North Central nonmetro economy, changes in farm conditions may also have substantial impacts on industries associated with agriculture: some areas and industries will benefit; other will be damaged. For example, local or national conditions conducive to increased agricultural production will generate a stronger demand for purchased inputs. These agricultural service centers that specialize in agricultural production will generate a stronger demand for purchased inputs. Those agricultural service centers that specialize in agricultural input industries such as fertilizers, pesticides, fuel, equipment, farm machinery, credit, labor, and agricultural service (i. e., custom application, tilling, harvesting, etc.) will benefit. More specifically, a stronger demand for farm machinery would provide employment opportunities not only to rural nonfarm residents (e. g., in Northern Iowa), but also to small-scale farmers in the areas that rely on off-farm employment for a substantial portion of their income. On the other hand, agriculture service centers specializing in food transportation, processing, and marketing would not fare as well since higher commodity prices slow growth and reduce the volume of products moving through the system to private domestic and export markets. The results would be opposite under decreased agricultural production.

Our limited current knowledge of economic linkages between the farm sector and the total local economy, among rural areas, and between rural and urban areas, does not allow us to quantify these effects. However, we can be sure that selective changes in agricultural conditions, e. g., in commodity programs, will have differential geographic effects. For example, a 10 percent set-aside provision in the 1985 feed grains program will affect not only corn production but also local employment opportunities in agriculturally related industries. Such effects may be especially significant for such areas as the corn and soybean production areas of Minnesota where the farm sector and the agricultural input and processing industries accounted for 18 and 11 percent of the total 1979 local

employment, respectively. In areas less dependent on employment in local agribusiness enterprises, on the other hand, farm program changes will affect individual farmers but may have only limited impacts upon local economies. An example is the corn-soybean growing areas of Illinois where agricultural inputs and processing industries accounted only for about 3 percent of the total 1979 local employment.

Notes

¹In this paper nonmetropolitan counties are the same as rural areas, and metropolitan counties are treated as urban areas.

²Farming-dependent counties are defined as those in which farming contributed, on an annual basis, 20 percent or more of total labor and proprietors' income between 1975 and 1979.

³For a definition of agribusiness industries, see Appendix Table 2.1(A).

⁴These production regions were delineated around typical farms producing specific major agricultural commodities and encompass one or more Rand-McNally Trading Areas. Thus, they represent a multi-county agricultural trading region specializing in various types of agriculture.

⁵See Appendix Table 2.4(A).

⁶A location quotient indicates the importance of a sector's employment to a region relative to the importance of that sector's employment in the U.S. economy. For instance, a location quotient of 2.0 for agricultural production in a region indicates that employment in agricultural production in that region is twice as important as it is for the U.S. as a whole.

⁷See Appendix Table 2.2(A).

⁸See Appendix Table 2.3(A).

⁹It should be noted that location quotients for input or processing industries can also reflect linkages to nonlocal economies, large farm machinery plants being a case in point.

Appendix Table 2.1(A). Agribusiness Classification

Industries	Standard Industrial Classification Code¹
I. Agriculture Input Industries	
Primary Industries ²	
Chemical and fertilizer mining	147.1492
Agricultural chemicals	287
Farm machinery	3523
Farm suppliers and machinery wholesale trade	5083, 5191
Farm credit agencies and commodity dealers	613, 622
Secondary Industries ³	
Water-well drilling	178
Prefabricated metal work and buildings	3444, 3448
Pumps and pumping equipment	3561
Misc. repair shops	7692, 7699
II. Agricultural Production	
Primary Activities ²	
Farm proprietors	N/A
Farm wage and salary employment	N/A
Agricultural services	07-09
III. Agricultural Processing and Marketing Industries	
Primary Industries ²	
Food and kindred products	20
Tobacco	21
Apparel and textiles	221, 223-5, 2261, 2269, 228, 2292, 2298-9, 231-8, 2397
Leather	31
Warehousing	4221, 4222
Farm products raw material wholesale	515
Secondary Industries ³	
Misc. textile products	2295, 2393, 2395
Containers	2441, 2449, 262, 263, 2641, 2643, 2645-6, 2651-5, 3221, 3262, 3271
Chemicals	2823-4, 2893
Primary fabricated metal products	3315-7, 334, 3411, 3466, 3497
Food products machinery	3551
Misc. manufacturing	3962-4, 3993

Industries	Standard Industrial Classification Code ¹
IV. Food and Fiber Wholesaling and Retailing	
Primary Industries²	
Wholesale trade	513-4, 518, 5194
Retail trade	54, 56, 58
Secondary industries	
Printing and published	271-2, 274, 2751-2, 2754, 2791, 2793-5

¹The Office of Management and Budget developed the Standard Classification Code as a method for industries to conform with the composition and structure of the economy covering the entire field of economic activities.

²Primary industries are defined as those industries that used all of their work force in the production necessary to satisfy the U.S. final demands for food and fiber in 1972.

³Secondary industries are defined as those industries that used between 50 and 100 percent of their work force in the production necessary to satisfy the U.S. final demands for food and fiber in 1972.

Appendix Table 2.2(A). Importance of Agriculturally-Related Employment in the Plains and Great Lakes States, 1979

Industrial sectors	Plains						Great Lakes					
	Metro		Nonmetro		Farm-dependent counties		Metro		Nonmetro		Farm-dependent counties	
	% of total	L.Q. ³	% of total	L.Q. ³	% of total	L.Q. ³	% of total	L.Q. ³	% of total	L.Q. ³	% of total	L.Q. ³
Primary agribusiness	6.2	0.7	28.5	3.1	43.2	4.7	4.5	0.5	16.7	1.8	33.8	3.7
Agricultural inputs	1.0	1.7	2.6	4.3	3.4	5.7	0.5	0.8	1.4	2.3	3.0	5.0
Agricultural production	2.1	0.5	20.8	4.5	34.8	7.6	1.9	0.4	12.1	2.6	27.1	5.9
Agricultural processing	3.1	0.8	5.1	1.3	5.0	1.3	2.1	0.5	3.2	0.8	3.7	0.9
Secondary agribusiness	2.7	1.0	1.9	0.7	1.2	0.5	3.2	1.2	3.3	1.3	1.8	0.7
Food & fiber wholesale/retail TCPU ¹	9.6	1.1	8.3	0.9	7.0	0.8	9.2	1.0	8.5	0.9	7.5	0.8
Wholesale/retail trade (excl. food & fiber)	6.7	1.3	4.1	0.8	3.0	0.6	5.3	1.0	3.9	0.7	3.8	0.7
FIRE	12.8	1.2	8.9	0.8	7.3	0.7	11.9	1.1	8.9	0.8	7.1	0.6
Services	6.2	1.2	2.9	0.5	2.7	0.5	5.4	1.0	3.0	0.6	2.9	0.5
Mfg. (nonagriculture related)	19.9	1.1	12.3	0.7	9.7	0.6	18.0	1.0	12.1	0.7	10.1	0.6
Construction & mining	14.4	1.0	8.2	0.6	4.7	0.3	22.6	1.5	22.3	1.5	11.3	0.8
Government	5.5	1.0	4.1	0.7	3.3	0.6	4.3	0.8	4.4	0.8	4.1	0.7
Total	15.9	0.8	20.8	1.1	17.9	0.9	15.6	0.8	17.0	0.9	17.6	0.9
Total agriculture related	100.0		100.0		100.0		100.0		100.0		100.0	
Total manufacture share	18.5		38.7		51.4		16.9		28.5		43.1	
Agriculture related	20.5	1.0	14.9	0.7	9.7	0.5	27.9	1.3	28.7	1.3	16.1	0.8
Agricultural related Mfg. (Pct of total mfg.)	6.1	1.0	7.4	1.2	7.0	0.8	5.3	0.8	6.4	1.0	4.8	0.8
	29.7		29.7		51.7		18.8		22.1		29.6	

¹Transportation, communication, and public utilities.

²Finance, insurance, and real estate.

³L.Q. = Location quotient. A location quotient represents the importance of a sector's employment to a region relative to the importance of that sector's employment in the U.S. economy. For instance, a location quotient of 2.0 for agricultural production in a region indicates that employment in agricultural production in that region is twice as important as it is for the U.S. as a whole represents.

Source: Government, railroad, farm proprietor, and farm wage and salary employment from Bureau of Economic Analysis; employment in other sectors was estimated from establishment records of *County Business Patterns*.

Appendix Table 2.3(A). Structural Comparisons of the U.S. Economy and the Economies of Selected Agricultural Production Areas in the North Central States, 1979

Industrial sectors	U.S.	North	Nebraska	Kansas	Iowa	Iowa	Minnesota	Illinois	Wisconsin
		Dakota wheat fallow	soybeans wheat alfalfa	wheat alfalfa soybeans	cattle corn soybeans	pigs-corn soybeans oats	corn soybeans	corn soybeans	dairy alfalfa corn
		Employment Distribution							
Primary Agribusiness	9.1	25.2	23.8	14.3	19.9	18.0	28.6	13.4	9.5
Agricultural inputs	.6	2.3	3.3	1.9	2.0	5.0	3.2	2.0	1.0
Agricultural production	4.6	19.9	15.6	9.2	12.0	8.5	17.8	8.5	5.0
Agricultural processing & mkt.	3.9	3.0	4.9	3.2	5.9	4.5	7.6	2.9	3.5
Secondary Agribusiness	2.6	.9	1.6	2.0	1.9	2.0	2.2	2.6	3.8
Food & fiber wholesale/retail	9.0	8.8	8.9	9.0	9.3	8.9	9.7	9.2	9.1
TCPU ¹	5.3	5.0	4.8	4.7	6.5	4.0	3.4	4.4	4.3
Wholesale/retail trade (excl. food & fiber)	11.0	10.5	9.6	10.2	10.6	10.5	8.9	10.3	11.0
FIRE ²	5.3	3.5	4.5	3.7	5.9	4.0	3.4	5.2	4.3
Services	17.4	15.5	13.4	16.0	16.5	13.7	14.3	15.4	18.0
Mfg. (nonagriculture related)	14.9	2.8	7.6	18.4	5.3	16.6	11.6	13.7	20.1
Construction & mining	5.7	4.7	4.6	6.2	4.4	3.9	3.5	4.9	4.0
Government	19.7	22.7	21.5	15.1	19.0	18.4	14.6	21.0	15.1
Total employment (000)	94,760	339	298	394	531	469	162	662	1,301
Pct. Agriculture related	20.7	34.9	34.3	25.3	31.1	28.9	40.5	25.2	22.4

Industrial sectors	U.S.	North	Nebraska	Kansas	Iowa	Iowa	Minnesota	Illinois	Wisconsin
		Dakota wheat fallow	soybeans wheat alfalfa	wheat alfalfa soybeans	cattle corn soybeans	pigs-corn soybeans oats	corn soybeans	corn soybeans	dairy alfalfa corn
Location Quotients ³									
Primary agribusiness	1.0	2.8	2.0	1.6	2.2	2.0	3.1	1.5	1.0
Agricultural inputs	1.0	3.8	5.5	3.2	3.3	8.3	5.3	3.3	1.6
Agricultural production	1.0	4.3	3.4	2.0	2.6	1.8	3.9	1.8	1.1
Agricultural processing & mkt.	1.0	.8	1.3	.8	1.5	1.1	1.9	.7	.9
Secondary agribusiness	1.0	.3	.6	.8	.7	.8	.8	1.0	1.5
Food & fiber wholesale/retail	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0
TCPU ¹	1.0	.9	.9	.9	1.2	.7	.6	.8	.8
Wholesale/retail trade (excl. food & fiber)	1.0	.9	.9	.9	1.0	.9	.8	.9	1.0
FIRE ²	1.0	.6	.8	.7	1.1	.7	.6	1.0	.9
Services	1.0	.9	.8	.9	.9	.8	.8	.9	1.0
Mfg. (nonagriculture related)	1.0	.2	.5	1.2	.3	1.1	.8	.9	1.3
Construction & mining	1.0	.8	.8	1.1	.8	.7	.6	.9	.7
Government	1.0	1.1	1.1	.8	1.0	.9	.7	1.1	.8
Total	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Agriculture related mfg.	1.0	1.7	1.7	1.2	1.5	1.4	2.0	1.2	1.1

¹Transportation, communication, and public utilities.

²Finance, insurance, and real estate.

³Represent the importance of a sector's employment to a region relative to the importance of that sector's employment in the U.S. economy. For instance, a location quotient of 2.0 for agricultural production in a region indicates that employment in agricultural production in that region is twice as important as it is for the U.S. as a whole.

Source: Government, railroad, farm proprietor and farm wage and salary employment from Bureau of Economic Analysis; employment for other sectors was estimated from establishment records of *County Business Patterns*.

Appendix Table 2.4(A). The Nonmetro Share of Agriculturally-Related Employment, 1979

	United States	Plains States		Great Lakes States	
	Nonmetro	Nonmetro	Farming-dependent counties	Nonmetro	Farming-dependent counties
	Percent of total employment				
Primary agribusiness	53.8	79.1	38.2	51.1	11.0
Agricultural inputs	53.7	67.5	27.8	44.1	10.0
Agricultural production	70.1	89.2	47.6	64.5	15.4
Agricultural processing and marketing	39.3	57.5	18.0	29.7	3.7
Secondary agribusiness	23.1	36.1	7.4	22.5	1.3
Food & fiber wholesale & retail trade	22.3	41.7	11.2	20.4	1.9
Total agriculturally-related employment	36.3	63.3	26.8	32.1	5.2
Total employment	24.5	45.2	14.4	21.8	2.3

Chapter 3

Agriculture and the Community: The Sociological Perspective

William D. Heffernan and Rex R. Campbell

One of the major concerns of sociologists interested in agricultural issues has been the relationship between agriculture and the rural community. The long-standing thesis has been that the social and economic dimensions of rural communities were dependent upon the agricultural sector. Researchers, drawing from a variety of theoretical perspectives, found that factors such as increasing numbers of farms larger than what are usually referred to as family farms, led to changes in the community.

The literature on the relationships between farm structure and the characteristics of communities can be divided into two categories. The first focuses on changes in characteristics of agriculture and difficult to quantify, noneconomic dimensions such as quality of life. The second focuses on changes in agriculture and trade patterns.

We will briefly review the literature on the relationship between agriculture and the community. Next, we will focus on the changing sources of income and employment in rural communities. This perspective will show a reversal in the dependency relationship, since in many rural communities today, farming is dependent on nonagricultural employment and income. Finally, we will suggest some possible community types of the future.

Agriculture and Social Interaction/Quality of Life

The number of farms in the United States has declined steadily since 1935. More recently a dual agricultural system has begun to emerge, with a few large farms and a host of small farms. In addition, some changes are occurring in the organization of agricultural production and processing. What effects do these changes have on the local community? Some changes are purely economic, as fewer consumers mean fewer retail goods and services purchased. But beyond this, other changes affect the social institutions and the quality of life.

Beginning in the late 1960s and continuing into the 1970s, a number of studies were conducted, focusing on the community and the sociological consequences of changes in agriculture. Most of these studies shared the hypothesis developed by Goldschmidt (1978a) in a 1940s California study that changes in farm size and structure would lead to changes in the rural community. In Goldschmidt's study, two communities were examined: Arvin, characterized by large farms with a hired labor force, and Dinuba, surrounded predominantly by family owned and operated farms. The community surrounded by family farms ranked higher than Arvin on a number of quality of life and social indicators, such as family income, level of living, social and physical amenities, social and religious institutions, and the degree of local control over the political process. The results of the study were politically unpopular and have been criticized on methodological grounds. In fact, the study was so unpopular that it was never published by USDA, for whom Goldschmidt was working.

In the mid-1970s the same two California communities were reexamined by LaRose (1973) and by Community Services Task Force of the Small Farm Viability Project (1977). Although neither study sought to be as thorough and as comprehensive as the original, the findings indicate that the differences in the social and economic dimensions of the two communities were as great or greater than in the 1940s. In an effort to test the same hypothesis using a different method, 130 towns in the San Joaquin Valley of California were examined. The researcher concluded that "the smaller scale farming areas tended to offer more to local communities than their larger counterparts" (Small Farm Viability Project 1977:242).

The California studies were not specific as to whether they were examining farm size or the social structure of farming. The assumption was that in California, larger scale farms were larger-than-family farms, often referred to as corporate farms or industrial farms. Neither did the researchers differentiate between small and medium sized farms, both of which were assumed to be family farms. Researchers in the Midwest and Southeast, however, need to be cautious in the use of these concepts, since larger size may or may not be related to changes in the structure of farming. The trend over the past several decades toward larger farms in the Midwest has not led to a change in the structure of farms.

In late 1950s, Ploch (1960, 1965a, and 1965b) focused on the relationship between the changing structure of farms and the rural community. He examined the characteristics of communities in which the production of eggs and broilers occurred under contract and compared them to communities in which the production of eggs and broilers was by independent producers. He concluded that there was little evidence that the two types of poultry producers were associated with different community status levels.

In 1969 Heffernan (1972) compared the social involvement in community activities of those involved in contract farming, larger-than-family farms and family farms. His conclusion was that there was little difference in the community activities of those working in contract farming and family farming systems, while there was a significant difference in the social participation of the workers and managers in larger-than-family farms. The managers were more involved in community and political activities than were the workers. A follow-up of the farm families involved in contract production and family farm operations was conducted in 1981 (Heffernan and Jenkins 1983). Findings indicated few differences between those producing poultry under contract and those producing feeder calves for a relatively competitive market. Beef producers were slightly more involved in social activities in the community, although poultry producers received slightly higher income from farming.

A study similar to the 1969 Louisiana study was conducted at about the same time in Wisconsin, examining some of the community activities of those working on family farms, larger-than-family farms, and industrial farms. Individuals on family farms were more involved in local volunteer associations and political and social activities than were workers on the other farm types (Rodefeld 1974, Martinson et al. 1977). A study of grape producers in Missouri in 1976 (Heffernan and Lasley 1978) produced similar conclusions.

In the mid-1970s a study done at Kansas State University (Flora and Conby 1977) tested the hypothesis derived from Goldschmidt's earlier research. It concluded that as corporations become more involved in agriculture there will be a decline in "mean community well-being." At about the same time, Goldschmidt (1978b) used secondary data to show that large scale farm operations

were positively associated with the proportion of the community population located in the lower class. He concluded that family farms are positively related to democratic rural communities. A replication of Goldschmidt's second study, conducted at Michigan State (Harris and Gilbert 1979), also supported the hypothesis.

The list of studies could be continued, drawing from researchers in Iowa, New York, and sociologists and economists in several states in the Southeast who are completing a regional project titled "Changing Structure of Agriculture: Causes, Consequences, and Policy Implications" (S-148). The growing body of literature suggests that even though different methodologies were utilized and studies were conducted over several years and in a number of geographic settings, the findings generally support the hypothesis that agricultural structure is related to different types of social interactions in rural communities.

Agriculture and Trade Patterns

A second community issue raised by changes in the size and structure of agriculture focuses on trade patterns. The primary question raised is whether large scale farm operators behave differently in their purchases of farm supplies and their sale of products than small scale operators. There is an assumption that large scale operators are more selective and will travel farther than small scale operators. Unpublished data from the 1969 Louisiana study showed few differences in the distance that family farmers, contract farmers, or larger-than-family farm owners/managers and their families traveled for the purchase of farm or personal goods and services. Likewise, there were not many differences in 1981, nor were there any major differences in distance traveled between 1969 and 1981 (Heffernan and Jenkins 1983).

In the summer of 1980, Korsching (1984) conducted a similar study of trade patterns in three Iowa watersheds. Drawing heavily on Goldschmidt, he hypothesized that size of the farming operation is positively related to the purchasing of goods and services in more distant trade centers. He looked at distances traveled for farm inputs (machinery, feed, seed, and fertilizer), farm enterprise and farm household needs (gasoline, fuel, lumber, hardware, legal/tax services, and financial services) and consumer goods and services (automobiles, groceries, clothing, furniture, and recreation). He concluded that Goldschmidt's thesis did not hold in the Corn Belt in Iowa. There were very few significant differences in the mean value of acres operated and gross farm income between farmers who purchase in small, local trade centers and farmers who purchase in large, distant trade centers. For the few cases in which there was a significant difference, large-scale farmers were as likely to purchase in small, local trade centers as were small-scale farmers. As in the case of the Louisiana study, there was a tendency for farmers to travel a shorter distance for bulky products such as feed and fertilizer and to travel farther for machinery. Also, the farm families were more likely to travel a greater distance for consumer goods and services than they were for farm inputs. This suggests that the trade pattern for farm inputs may not be the same as the trade pattern for consumer goods and services.

In response to the suggestion of some Missouri agricultural leaders that 12 major agricultural trade centers (megacenters) were emerging in their state, a similar study was conducted in Missouri. In the fall of 1984 we received 2,004 completed questionnaires from a random sample of Missouri farm operators. The farm operators were asked how far they traveled for selected goods and

services both for the farm and for the family. Data in Table 3.1 indicate that farm operators on large farms do not travel any farther for their goods and services than do operators of medium or small farms. (Large farms were those with agricultural sales over \$100,000.) The data also suggest little change in the distance farmers travel for farm inputs over the past 10 years (Table 3.2). Only about 10 percent of the respondents indicated they traveled farther for farm inputs today than they did 10 years ago. The data suggest that more farm families are traveling farther today for consumer goods and that farm families travel farther for consumer goods than for farm inputs.

Our conclusion is that there is little evidence to suggest that a major trend changing the travel patterns for the purchase of farm inputs is under way. We are not suggesting that the numbers of agricultural suppliers and markets will not decline; indeed they will. But they will not be grouped into agri-megacenters in the foreseeable future. Although social relations may change in some rural communities, changes in neither structure nor size seem to indicate the loss of the economic base derived from agriculture in most rural communities.

Table 3.1. Average Distance Traveled for Selected Purchases by Farm Size (Sales)

Item Purchased	Farm Size (Sales)		
	\$40,000	\$40,000-99,999	\$100,000 or more
Appliances	16.84	17.41	15.98
Auto repairs	11.05	11.71	10.88
Men's clothes	20.49	20.98	21.09
Women's clothes	20.77	26.82	24.03
Commercial feed	9.94	12.60	10.98
Fertilizer	10.31	9.54	10.18
Chemicals	11.43	10.06	9.43
Equipment/repairs	17.81	17.22	16.03

Source: 1984 Missouri Farm and Rural Life Poll

Table 3.2. Percent of Farmers Whose Current Source of Purchases Is Farther Away Than the One Used 10 Years Ago—by Farm Size (Sales)

Item Purchased	Farm Size (Sales)		
	\$40,000	\$40,000-99,999	\$100,000 or more
Appliances	11.39	12.84	15.96
Auto repairs	9.98	12.30	10.20
Men's clothes	12.03	14.34	13.85
Women's clothes	12.31	16.10	14.87
Commercial feed	6.83	10.81	9.47
Fertilizer	5.81	8.85	7.25
Chemicals	5.88	9.06	5.24
Equipment/repairs	11.17	15.69	13.40

Source: 1984 Missouri Farm and Rural Life Poll

Sources of Income in Rural Communities

The relationship between agriculture and the rural community is further complicated when one looks at the source of employment in rural communities. An assumption exists that in most rural communities farming and jobs related to farming are the basic sources of employment. Undoubtedly this was correct several decades ago for most rural communities, but his assumption, which continues to receive support from people who hold agrarian fundamentalism beliefs, is questionable today. According to this thesis, farming is the source of virtually all income. Therefore, as agriculture goes, so goes the community, the nation, and the world.

Starting after World War II, the soft goods and shoe industries moved into the South and then into the Ozarks. These industries were followed by other labor intensive industries (Summers et al. 1975). They hired predominantly women, most of whom resided on farms. Thus a small scale farm that by itself would not produce an adequate family income became part of a package of income sources.

Another significant source of employment expansion was created with the development of retirement programs that encouraged the movement of the elderly to many rural areas. These retirees brought wealth with them in the form of transfer payments. Often retirement communities were associated with another growth industry: recreation. Lakes, rivers, seashores, and mountains became rural America's playgrounds, and at the same time, provided local employment. Further, many colleges, universities, state capitals, state prisons, and state mental hospitals are located in relatively small communities, and thus employment is available to people residing on farms or in small towns.

During this same time, better and cheaper transportation and the relocation of industries within metropolitan areas have encouraged commuting to metropolitan areas from rural communities.

These major changes in type of employment in rural areas illustrate the growth of nonfarm employment and nonfarm sources of income in most contemporary rural communities. In most rural communities today, full time commercial farm operators are a small minority. There are, of course, communities and areas where this is not true, but these are the exceptions and not the rule. Ross et al. (1984) in their review of changes in rural America drew these conclusions:

- The dominance of agriculture has declined steadily. The number of farms dropped to under 3 million and farm population was less than 10 percent of total U.S. population by the late 1960s (U.S. Department of Agriculture 1981, Beale 1978).
- Rural industrialization began to open up new job opportunities, particularly in manufacturing (Summers et al. 1976).
- Farm and nonfarm women began to enter the labor market in record numbers. Employment growth in the 1960s was due largely to female employment. About 36 percent of women 14 and over were in the labor force in 1970 (Brown and O'Leary 1979).

Employment of various types is the major source of income in most rural communities. However, transfer payments, primarily social security, are more important than any type of employment as a source of income in a majority of rural Missouri counties. Transfer payments are in essence "invisible" sources of income and not recognized for their importance in local communities, even by many researchers (USDA 1984).

Ross et al. (1984) delineated seven types of rural counties using factor analysis. Agriculture was one of the types and included only 29 percent of the nonmetropolitan counties in the U.S. Agricultural counties were defined as those in which 20 percent or more of the income of labor and proprietors came from agriculture. The types of counties were not mutually exclusive. Twenty-seven percent of the counties overlapped into two or more types and 15 percent fell in none of the seven. Thus, in less than 30 percent of the nonmetropolitan counties did agriculture account for as much as one-fifth of the labor and proprietor income.

A higher cutting point (30 percent of the income of labor and proprietors) was used to define manufacturing counties, but almost as many nonmetropolitan counties (28 percent) were included in manufacturing as in agriculture. If the same cutting point had been used, many more of the nonmetropolitan counties would have been defined as manufacturing than as agricultural. Other counties have recreation and/or retirement or other service industries as their most important sources of employment. The supremacy of agriculture in most nonmetropolitan counties has declined.

The movement toward a dual agriculture in the Midwest has become well documented following the 1982 Agricultural Census. In all states in the Midwest, the number of farms of less than 50 acres increased in the 1978 to 1982 period. Likewise, larger farms (over 1,000 acres) also increased in number. In fact the Midwest was somewhat different relative to other parts of the country in that it experienced significant increases in numbers of farms of over 2,000 acres. With these increases of both large and small farms, it is not surprising that medium-sized farms (50 to 1,000 acres) decreased in number.

The explanation for the increase in the number of small farms is that these farm families depend heavily on nonfarm income. The data for the entire country support this proposition. Families on farms of less than 50 acres received an average of \$17,000 of nonfarm income and only a few thousand dollars of farm income. The total income was about the average income for metropolitan families during the same time.

In Missouri, the profile of occupations held by people receiving farm income in 1979 was almost identical to that of the nonfarm employed labor force in the state (holding the proportion of farm operators constant). We found the same proportion of people receiving farm incomes who said they were professionals, operatives, etc., as those who did not receive farm incomes. Thus, the relatively high nonfarm income is not surprising. It is especially interesting to note that the average nonfarm income for farm families operating more than 1,000 acres is almost the same as for those on small farms (about \$17,000 annually).

It is the families on medium-sized farms who receive relatively less nonfarm income. These are usually the farms that are rapidly declining in number. The reason usually given for the survival of the larger farms is that they are more efficient-sized operations. Yet, numerous studies have suggested that in the Midwest most of the economies of scale can be obtained on a 500 or 600 acre farm. Perhaps nonfarm income is a major explanatory variable in the survival of large farms as well as small farms.

Today, agriculture in the Midwest is facing a major crisis. Survival of many of the farms will depend on access to nonfarm income. In our 1984 farm poll (Heffernan et al. 1985), we found that in 33 percent of the farm families, some family member had taken a nonfarm job in the past year. In another 19 percent of the families, a family member was still searching for such a job. But even in

better years, such as those upon which the 1982 Agricultural Census was based, nonfarm income was highly correlated with farm survival. Albrecht and Murdock (1984) found that nonfarm sustenance diversity and percent of total acreage in harvested cropland were by far the best two predictors of the amount of part-time farming. In essence, part-time farming existed where a variety of types of nonfarm employment was available and where row crop agriculture was not a major portion of the agriculture.

In rural America there is a very close tie between nonfarm job opportunities available to residents of rural communities and the number of farms. Today, the average American farm family cannot maintain an adequate family income purely from farm sources. It is necessary to have some supplemental income for the family to stay on the farm. Data from our recent farm poll in Missouri support the earlier USDA report that 92 percent of the farm families have some nonfarm income. The 1982 Census of Agriculture data revealed that about one half of the farm operators said farming was not their principal occupation. An interesting point is that for the United States, the number of farm operators working one hundred days or more off the farm has remained relatively constant since 1950, while the total number of farm operators has declined sharply. One implication is that those who worked off the farm were more likely to continue as farmers. Another is that farm operators today are more likely to have major off farm employment.

In one of the most economically distressed agricultural counties of Missouri, many farms have ceased operation and more are facing bankruptcies. Many businesses have closed and two banks have been closed. One of the major differences between this county and neighboring rural counties where fewer farmers are quitting is that a shoe factory and a cable factory, which together employed about 500 workers, closed in the past three years. It is academic to decide whether the closing of the two industries or the financial condition in the farm sector is the major contributor to the financial conditions in the community, but the interaction of the two has been especially significant. The obvious conclusion is that either an improvement in the farming sector or an increase in nonfarm jobs in the county could have major impact in the county. Many of the farms could have been saved if nonfarm jobs had been available.

The dependence of agriculture on the nonfarm sector is especially important for the production of some commodities. Missouri, which is a small farm state, ranks second only to Texas in the number of feeder calves produced. The average herd size of beef cattle in Missouri is about 25. Feeder calf production is the major enterprise on small Missouri farms. The evidence is quite clear that if feeder calf producers calculated a reasonable economic return for their land, labor, and cattle investment, the vast majority could not show a profit (Jacobs 1984). Data collected from members of the Mail-In-Records Association at the University of Missouri suggest that the production of feeder calves is not an economically profitable operation. One must look for other motives to explain why farmers continue in the production of feeder calves. The urban to rural migration and numerous residential preference studies suggest many Americans like rural living and want to own some land (Zuiches 1982). Often the less expensive marginal land, which is considered to be most desirable for a rural residence, is also most suited to producing pasture and hay. The land is often purchased primarily for residential purposes and not for producing beef. Most beef producers do not expect an economic return for their land and labor. The

land is for their residence, and their so-called labor may be a benefit (since they enjoy working with cattle) and not a cost. Nonfarm jobs in Missouri subsidize the feeder calf industry. Families who raise such other commodities as poultry and feeder pigs are also heavily dependent upon nonfarm income. Seventy-two percent of the U.S. farm families receive 99 percent of their net family income from nonfarm sources.

In the areas of Missouri not suited to intensive crop production, the continued existence of farming is very highly dependent on nonfarm jobs being available to the farm families. If rural communities in most areas of the United States have major nonfarm income sources and reasonably priced land available, they will also have considerable numbers of small farmers. Given the financial problems faced by the majority of medium and large farms operations today, nonfarm income sources can mean the difference between survival and failure. The farm and nonfarm sectors of rural communities have become so interdependent that it has become impossible to speak of one as the dependent and the other the independent variable.

Communities of the Future

Although much agricultural production, such as feeder calves and crops, requires considerable space, modern technology has made possible confinement raising of several types of livestock. We suggest the relationship between agriculture and community will be different for communities characterized by geographically dispersed farms as compared to highly concentrated, specialized farms. We will first examine communities that serve the geographically dispersed agricultural systems. Then we will examine the relationship between the community and concentrated production systems.

The Development of Satellite Systems

The studies of trade patterns do not suggest that smaller rural communities will be bypassed in the servicing of agriculture. However, changes occurring in the organization of agriculture may lead to a concentration of control in some communities.

The increasing need for specialized knowledge, skills, and equipment (capital) to service the agricultural production sector will prevent every small equipment, chemical, and marketing facility from providing a full array of services. The specialized services needed by an industrial agriculture will be provided by a few large, centralized facilities. These centralized facilities will be directly tied to satellite facilities in other rural communities, following a pattern that has developed in the organization of rural health care. It is possible that the centralized facility and the satellite facilities may be owned by a parent company and the satellites franchised to private individuals as is done today.

Modern communication, transportation, and data processing will allow for a rather complicated inventory to be maintained between the centralized facility and the local branches. In the case of farm equipment, the local dealerships will not need to maintain an extensive inventory of expensive, seldom called for parts that could be made available for rapid delivery from the centralized facility. Likewise, relatively simple and routine repairs can be performed at the local dealership, but major overhauls requiring more skills and specialized equipment will be performed at the centralized facilities. This satellite system is already being developed. Equipment dealerships, as well as feed and fertilizer

outlets, are being linked together formally or informally. For example, a locally franchised feed dealership maintains a very limited inventory of feed, but at least once daily a truck is sent to the manufacturing plant where an extensive inventory is maintained.

Given this scenario, control and possibly much of the profit from businesses and services may be drained from most smaller communities. There will probably be a tendency for centralized facilities to concentrate in certain key communities, although smaller firms with less economic power may choose to locate away from the key communities. If the parent company operates the centralized facility, the control and profit may be completely removed from the rural communities to distant urban headquarters. This system does, however, maintain some agriculturally related jobs in the smaller communities. The major impetus for this system, as opposed to the megacenters, results from the farmers' need to reduce travel time and have faster service. The economic costs of travel per se are important considerations for farmers, but equally important is the cost of time, especially during the critical planting and harvesting periods. A large centralized bulk fertilizer plant 50 or 60 miles away will have trouble responding rapidly to farmers' needs. The alternative to a localized satellite system is for farmers to maintain a large inventory of their own. The cost of this inventory and the facilities required, in the case of bulk fertilizer for example, will encourage the continuation of local facilities. There will, however, be much tighter coordination between the local distribution facility, the centralized facility, and, indeed, the parent company. In Missouri, the banking industry is moving in this direction through the use of holding companies (Green 1984).

The current farm crisis in the Midwest sets the stage for the larger parent companies, which in many cases are conglomerates that can survive losses in one sector, to become more directly involved in local distribution.

The local entrepreneur who is well established will discourage the rapid transition to this satellite system. In many cases, the local owner is also engaged in a farming operation or has some other income source. The satellite system may enhance the development of "farmer-dealers." Such multiple sources of income may make the small local dealers more competitive than larger single-product firms.

Loss of Value Added

The argument above suggests that although many local communities will continue to provide services for agricultural production, changes in the agricultural services will result in smaller and smaller contributions to the economic base of the rural community.

Fifty years ago, labor was the major input variable in agricultural production. The farm family was relatively self-sufficient, producing the greatest proportion of what it consumed and consuming a major portion of what it produced.

Commercial agriculture has meant a movement away from self-sufficiency and toward an increased dependency on purchased inputs and commercial markets. The trend toward the increased purchase of inputs has continued until today, on many of our large commercial farms, where labor represents less than 10 percent of the input cost. Likewise, even the importance of the land input diminished as purchased inputs became more important.

The consequence of this is that large scale industrial farms resemble assembly plants. A variety of inputs are brought together and distributed spatially in a large geographic area. Energy, in the form of fossil, fuel, and solar energy, is utilized in the relatively long production process. The product is then assembled and shipped off for further processing or sales. The major difference between agriculture and other industries is the relatively long production time (Mann and Dickenson 1978) and the large geographic area required for production. In the case of most livestock production, however, confinement operations have greatly condensed the geographic space required.

The point is that—over time—the farm family has contributed less and less to the value-added nature of the product. Increasingly, commercial farms assemble, as opposed to produce, products. A measure of total farm sales or volume of food and fiber produced gives little indication of the importance of agriculture to the economic base of the community.

Likewise, local agribusiness firms such as farm equipment dealerships handle a much larger sales volume today because they are selling expensive equipment. However, little of the income from the sale is retained by the dealer or remains in the rural community to contribute to its economic vitality. Most of what the farmer pays the implement dealer is transferred directly to the manufacturer of the equipment. Local machine and welding shops with relatively small revenues may generate as much economic revenue for the community as do equipment dealers with much larger gross revenues.

Often, retail operators are so eager to compete for the "volume business" of the larger operators that they give relatively large discounts. These discounts usually reduce the "profit" earned by the local agribusiness firms, since they are taken from that portion of the sales that would otherwise contribute to the economic base of the local community. This local profit might be used for construction, hiring additional workers, or increasing personal consumption by the families owning and/or working in the agribusiness firm.

As smaller farms are combined into larger farm operations, there is little doubt that the rural community loses some of its economic base even though there is no change in the volume or value of the agricultural products handled. In addition to the discounts or lower profits made per unit of input sold, the combining of smaller farms into larger farms often means a reduction in the labor input. Because the input cost that goes to labor is usually manifested in family consumer expenditures, a reduction in labor means a loss of family consumer expenditures in the community. Much of the input cost that goes to the capital, energy, and chemicals that replace labor "passes through" the community and contributes little to its economic base.

In summary, the economic benefit rural communities gain from agriculture is highly related to the value-added portion contributed by the agricultural community. Some of the changes that have taken place in agriculture have reduced the value-added and have thus undercut the economic viability of the rural communities.

Concentrated Production Systems

The foregoing discussion of trade patterns is applicable for areas producing grain and for ranching areas (including small scale cow-calf farms) that require large land areas. However, livestock operations increasingly are being concentrated, and the production and processing are frequently integrated into one firm.

The Louisiana area, selected because it had the largest concentration of broiler growers in the state, was studied to examine possible effects of integration of producers and processors. In broiler production, no retail businesses are involved. The birds remain the property of the integrating firm that provides the feed and the health supplies. Thus, the poultry industry purchases little from local merchants. The local processing plants of the integrating firms do, however, hire truck drivers and others who are involved in picking up the poultry and delivering both the feed and the chicks. Because integrating firms do not travel beyond 25 to 30 miles for their growers, an entire industrial organization is located in a rural community. The local plant hires workers for the feed processing, as well as for the processing of the birds. Although the integration of the poultry industry reduced the need for some local agribusiness firms and provided a mechanism to channel most of the profits from the poultry industry out of the local community, it did provide both farm and nonfarm jobs in the area. This was at the expense of other communities that had formerly produced poultry.

In the 1981 Louisiana study, we did not formally interview the nonfarm workers involved in the broiler industry. When talking with people in the community, however, it became obvious that many family members on smaller farms in this marginal agricultural area took nonfarm jobs with the integrating firm. Car pools and even company buses provided transportation to the plants some 25 miles away. It appears that communities in which broiler processing firms are located exchange retail jobs for production jobs. Many of the production jobs required relatively unskilled workers and were not considered desirable jobs.

There are now about 237 poultry processing plants in this country that travel about 30 miles from their processing plant for their growers. In smaller towns these firms dominate the community. However, producers outside of this area have no markets, so production is geographically concentrated.

In some of the Plains and western states, including Kansas and Nebraska, beef slaughter and feeding has become the major industry for some rural communities. Communities such as Garden City, Kansas, home of the largest beef slaughter plant in the United States, are dominated by such industries. Slaughter plants were naturally located near concentrations of cattle and feed production, but once the plants were built, they attracted more feedlots. Today, it is impossible to differentiate the farm and nonfarm segments of this industry. If slaughter companies such as Cargill (Excel) do not directly own and operate the feedlots, they have a major influence on them. It can be concluded that, as it became possible to produce animals in confinement, the production of these animals became clustered around a few communities. The industry both produces and processes the product in the same community, so that these communities can be considered company or commodity communities.

The events occurring in the Midwest and Southeast in the hog industry are also of interest. Although good data are lacking, it is acknowledged that contract hog production is increasing rapidly. Hog production will likely follow the same path as beef feeding and poultry production because it can be done in a relatively small geographic area.

Summary

Agriculture and rural communities will continue to undergo change. The emergence of a dual agricultural system, the need for sophisticated knowledge and equipment, the declining importance of labor, and the geographic and organizational concentration of the production and processing of certain commodities will have a major impact on some rural communities. Some of these changes will have negative social and economic impacts on the rural communities involved, but the importance of these changes for rural communities should not be exaggerated. The notion that rural communities are totally dependent upon agriculture is a belief system left over from the first half of this century when agriculture was virtually the only rural enterprise. Although it is true that many rural communities are heavily dependent on agriculture, especially in such commercial farming areas as the Corn Belt, much of agriculture is also dependent on the rural community.

We suggest that different types of communities will emerge, based on the interaction of agriculture and the community. In most rural areas, agriculture plays a minor role in the economic and social base of the community. In these areas small farms tend to dominate, and they depend primarily on the employment opportunities available in the community. A few communities will be included in the production and processing of a very specialized commodity, such as broilers. In these commodity communities, the production and processing will be controlled by a single firm and there will be little difference between those working in the production and in the processing sectors. The third type will be the traditional pattern in which the community serves, and is highly dependent on, the farmers. But even here changes will occur. The importance of agriculture to the economic base will decline, and the control of the local agribusiness firms will move increasingly out of the local community.

Sociologists and economists need to do more descriptive and analytical work on contemporary rural communities. We suggest that the primary mode of production and proximity to metropolitan areas are two of the most important characteristics affecting the viability of rural communities. Commercial agriculture is just one of several important primary modes of production found in rural communities. The loss or decline in any of the production modes can have major consequences for rural communities.

Powers and Moe (1982) concluded that "failure to recognize the [social, economic, and demographic] diversity within the rural sector and between rural and urban areas has resulted in national growth and development policies insensitive to the spatial distribution of the effects." Similarly, we conclude that failure to recognize this social, economic, and demographic diversity within rural areas, combined with the changing relationships between agriculture and the remainder of the rural communities, also leads to inaccurate development policies. With the current crisis in agriculture producing major changes in the local agribusiness structure, it is absolutely imperative that all people involved in research, extension, and policy-making be more aware of the current structures and their interrelationships in rural communities.

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Chapter 4

Rural Economies and Farming: A Synergistic Link

Ron Shaffer, Priscilla Salant, and William Saupe

The influence of changes in rural communities on farming has not received as much attention by researchers and policy makers as has the reverse relationship. Congressman De La Garza, Chair of the U.S. House of Representatives Committee on Agriculture, recognized this gap in our understanding in his introduction to the recent House Agriculture Committee report:

There is today a great and serious gap in the information which Congress and policy makers in other areas need to make intelligent decisions about issues involving the future of the nation's agricultural communities. We have a great deal of up to date and detailed information about the industry of agriculture. But we have much too little information about what is happening in the communities in which our farm families live, and what developments in those areas mean to the people there and to the rest of the nation (U.S. House of Representatives 1983, p.5).

Our charge at this conference is to examine the interdependencies between the rural economy and farming. Although we recognize the relationship is two-directional and synergistic, our major focus will be the influence of changes in the economies of rural communities on farming.

Even though the farming economy has grown according to many forms of measurement, it no longer dominates rural or nonmetropolitan America. Rural communities are rapidly supplementing farming with nonfarm activities. In nonmetropolitan Wisconsin counties, for example, between 1970 and 1983 farm proprietor income ranged from 12.3 percent (1973) to 7.8 percent (1982) of total personal income (Bureau of Economic Analysis 1983). With this relative decline, there are two trends of increased importance to policy makers: first, the disappearance of the perceived homogeneity of rural areas (Blakely and Bradshaw 1983) and second, the increased link between farming and nonfarm sectors for both inputs and markets.

Defining our terms is the first step in analyzing the interdependency between the rural economy and farming. Clearly, we must distinguish between "farming" and "rural." Even as early as 1910, over one-third of Americans living in rural areas were nonfarm residents (USDA 1974). In 1980, the non-metropolitan population was 74 percent rural nonfarm (U.S. Bureau of Census 1982). Second, we must distinguish between "farming" and "agriculture." For our purposes, "farming" refers to the production of crops and livestock, while "agriculture" also includes the input supply and marketing firms in the food and

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fiber production and distribution chain. "Rural" will mean nonmetropolitan, including both agricultural and nonagricultural activities.

Welfare theory, export base theory, and central place theory provide some insight about the influence of changes in rural economies on farming. These theoretical constructs will be reviewed briefly prior to our exploration of linkages between rural economies and the farm sector. Specific linkages include nonfarm jobs and income, availability of consumer goods, and the link between export and nonexport activities. Some of the linkages have been documented empirically; others we can only hypothesize about. The examples we mention are not exhaustive, but represent the kinds of synergistic links that need additional attention from researchers and policy makers.

Theoretical Constructs Explaining Interaction

Three major theoretical constructs important to this analysis are welfare theory, export base theory, and central place theory. None provides all the insights desired, but each emphasizes important relationships and their influences. Many people have an implicit theoretical foundation for discussing farm-rural community links, but the popular interpretation of the theories often is not borne out by careful examination of the evidence.

Welfare Theory

While economic efficiency, given some distribution of resources and their ownership, is a special case in welfare economics, welfare theory is particularly concerned with equity and distributional issues. Welfare theory helps us understand who receives jobs, income, or profits. The current concern about the demise of the family farm and the economic hardships of smaller and medium-sized farms is in part stimulated by the distributional consequences of the benefits and burdens of the current economic malaise in farming. For example, interest rates are determined outside the farming sector. However, the burden of historically high and fluctuating interest rates falls disproportionately on the 19 percent of all farm operators that owe two-thirds of the total debt (Melichar 1984).

Economics can answer in an objective fashion the questions of maximizing efficiency as long as the original distribution of income or resource ownership is given. But if the distribution of income or resource ownership is not given (or acceptable), then decisions regarding market efficiency are altered (Just et al. 1982, p. 11). Generally, economists argue that the distributional questions are political decisions and all economic theory can do is review the alternatives and their implications.

Export Base Theory

Export base theory also helps understand the linkage between rural economies and farming. In its original form, the theory contended that the economic vitality of a community was dependent upon its capacity to produce goods that were sold in external markets. Traditionally, the community had to physically ship a good beyond the community boundaries to qualify it as an "export." This definition or concept, however, fails to accommodate the significant and on-going transformation of the U.S. economy into a service-producing economy. These service activities take the form of recreation, health care, telecommunications, engineering, among other services. It is generally accepted that such

services are not frills to some minimal standard of living. These are services supplied not only in urban areas, but in rural communities as well (Smith 1984).

Current interpretations of export base theory suggest the export base of a community is any economic activity bringing income into the community, thus freeing the theory from the limiting idea that a physical good must cross the community boundary to be an export. This new interpretation of export base theory not only recognizes the more traditional forms of exports but incorporates service-oriented export activities, including the receipt of Social Security benefits and other income transfers received by community residents.

The essence of export base theory is that the export base is the engine of growth for the community. Because of the economic linkages between the export sector and the remainder of the community, the community grows or declines depending on the success of the export sector. The community's economy will only grow to the extent that the export base is vigorous and grows. Historically in rural communities, export activity has consisted of farming and some manufacturing. Farming, beyond a doubt, meets the criteria of being an export sector business in rural communities. It typically ships its product beyond the boundaries of the community and is a source of external income, whether through direct sales, sales to other local firms who in turn feed or process the commodity, or through federal farm commodity program payments.

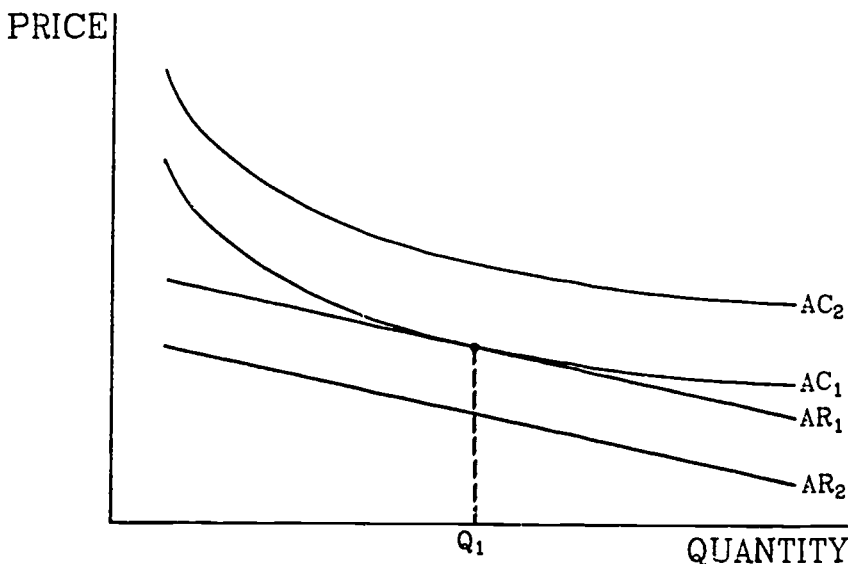
Export base theory suggests that economic growth occurs only through the stimulus of changes in the export sector. This ignores changes in the export sector (and its continued competitiveness) that are often stimulated by independent changes in nonexport sector activities. For simplified examples, consider how changes in commodity transportation rates and the availability of storage facilities affect the profitability of local farming. A strict interpretation of export base theory in the past would have contended that community well-being could not be improved by altering the nonexport sector first. In fact, one of the major ways changes in rural economies can affect farming is through changes in what are commonly perceived as "support activities."

Central Place Theory

The third theoretical construct providing insight into the relationship between the rural economy and farming is central place theory. This theory suggests that community trade and service activities depend on (1) the distance people will travel to purchase a good or service, (2) the costs of providing that good or service, and (3) the size of the market needed to earn minimum profits.

Figure 4.1 shows the relationship between an individual firm's average cost of providing various quantities of a good or service (AC_1) and market demand, represented by the average revenue curve (AR_1). The point of tangency of the average revenue and average cost curves is the demand threshold (Q_1). The demand threshold is the minimal market required for a firm to provide a product and still earn a normal profit.

The most common application of central place theory to the issue of farming and rural economies concerns population change. In Figure 4.1, demand curve AR_2 represents a population decline. Since the given firm's average costs have not changed, the firm can no longer profitably offer this particular good or service from its present site. The firm either needs a larger market (repopulation) or its competitors must exit to make the site profitable. Alternatively, per capita income can increase to permit this site to continue to be a profitable location.

Figure 4.1. Demand Thresholds

Central place theory partially explains why some businesses in rural communities have closed or moved elsewhere. The decline in the number of farms, for example, has decreased the demand for many farm input supply firms. Likewise, the declining population in some rural areas has shifted the demand for consumer goods and services. Central place theory also helps clarify why other rural areas have seen businesses expand. The recent rural population turnaround observed in some areas, coupled with increases in nonfarm income of both farm and nonfarm persons, has shifted the demand curve back to the right (or at least halted its leftward shift). Thus, the turnaround has permitted rural communities to maintain or even enlarge the number of input suppliers and/or consumer businesses.

In addition to population change, central place theory can also be applied to changes in the cost of providing selected goods and services. Such changes may alter the market required to support many activities (shift in average cost curve to AC_2 in Figure 4.1), and can occur in consumer as well as farm input businesses. The result of increased costs may be a decline in the number of establishments in nearby communities, a decline that causes farm families to travel farther to purchase consumer items or farm inputs or to do without. Alternatively, the cost of providing some consumer goods may decline, and thus they may become more readily available in rural areas (Chase 1980).

These three theoretical constructs (welfare theory, export base theory, and central place theory) provide a framework to guide the issues raised in the remainder of this paper. We are concerned about the welfare of rural residents, with particular interest in those who farm. Welfare theory helps us identify the effects of socioeconomic change on particular groups. Central place and export base theories provide insight into the causes of the observed and anticipated socioeconomic changes.

Rural Economic Influences on Farming

The preceding review of economic theory provides a start in itemizing the types of influences radiating from rural communities to farming. These influences may be broad and far-reaching (e.g., rail deregulation) or specific (e.g., the closing of a local implement dealer). In the following section, we offer a series of hypothesized influences, demonstrating either their magnitude or direction of influence, first with national data and second with evidence from Wisconsin. Some of the links are empirically supported by available data; others remain hypothetical.

Consumer Goods and Services

Traditionally, rural communities affected farming via their role as trading centers for the surrounding farms. These communities evolved to provide marketing links or input supplies for a multitude of smaller, family-oriented farms. Only partially stimulated by the decline in the farm population, rural merchants through the 1960s demonstrated a general decline in numbers, product selection, etc. (Chase 1980; Johnson 1982). That trend appears to have slowed and even reversed in many rural areas, yet the decline of farm population continues. The reversal of the long time depopulation of rural areas that became evident in the early 1970s appears to be continuing into the 1980s, but at a slower rate (U.S. Bureau of Census 1984). One cause for the reversal was the appearance of nonfarm wage and salary jobs in nonmetropolitan counties (Sofranko and Williams 1980:47-52).

This repopulation has several implications for farming. First, it can mean increased markets for local merchants, continuing or permitting local access to numerous consumer goods. Second, it can lead to conflicts between farmers and nonfarm residents concerning farming practices, odors, dust, etc., to which land use regulations and right-to-farm legislation are one response. Third, repopulation may necessitate more or improved public services, such as school expansion and increased road maintenance and construction. If these services are partially financed by property taxes on farm land and have limited direct benefits for farmers, then farmers' welfare may be reduced.

In his study of the level of retail services in nonmetro counties of the U.S., Johnson (1982) notes that many retail stores disappeared because of population declines and increased sophistication and mobility among the remaining population. Retail sales, however, increased regardless of the direction of population change, a phenomenon he attributed to increased income. Johnson found that population gains and income growth were very important forces in retail sales growth. The results of Johnson's analysis are consistent with central place theory. Population declines lead to a decline in retail stores, but income growth offsets some of that decline.

The loss of local retail establishments affects farm and other nonmetro families in similar ways; for example, they have reduced access to the service or they use relatively more of their income for travel costs versus the purchase of the goods. If rising levels of nonfarm income contribute to either higher or less volatile total household income for farm persons, demand for retail services may remain high enough to permit continued local operation of some retail establishments.

Wisconsin data for 1971 and 1981 do not consistently indicate the same changes found in Johnson's analysis (U.S. Bureau of Census 1973 and 1983). Among food stores, the number of establishments in nonmetro areas declined, while at the same time the number of employees per establishment increased. Such a trend implies a broader product line and selection. Among other types of consumer goods and services, however, the number of establishments increased. For example, the number of apparel stores increased by 51 percent, personal service establishments by 14 percent, and medical services by 61 percent. Each of these relative increases exceeded changes in metro areas, suggesting improved local access to consumer businesses.

Farm Inputs

Because today's farms are increasingly dependent on purchased inputs, the farm input market is another form of interaction between farming and the rural economy. Again, market size and the capacity to support such retail establishments as equipment and feed dealers, repair services, and veterinarians are important.

A substantial portion of the increase in farm productivity is due to increased use of physical capital, energy, fertilizers, chemicals, improved seed varieties, animal genetics, etc. Thus, farms are becoming more closely linked to the nonfarm economy that is the source for many of the inputs no longer produced within the farming sector *per se*.¹ The concerns of farmers about acquiring fuel or nitrogen fertilizer during the mid-1970s are indications of the strength of this linkage and how changes in the nonfarm economy influence farm production practices and management decisions.

The recent Tenneco offer for International Harvester provided the general public a glimpse of the input linkages. The new Case/IH combination will permit rationalization of the apparent overcapacity in the farm equipment manufacturing sector, as well as an opportunity to reorganize the dealership network. Such changes may lead to the loss of local access and competition and would further contribute to the current decline in farm equipment dealerships. The emerging farm input sector seems to be characterized by a trend of increasing concentration in a few firms (e.g., Deere and Co. and Case/IH) that will put increased competitive pressure on the smaller equipment manufacturers and dealers. The implications of such concentration are likely to be subtle and long term. They may appear in the form of reduced competition in prices, new product development, or loss of local access. On the other hand, smaller farm input firms may emerge and survive by identifying a definite geographic or product market niche in which they can compete. In such cases, local farmers may experience some benefits due to increased competition.

The evidence of change in the number of farm input establishments in Wisconsin does not provide a definitive conclusion supporting or denying national trends or theoretical expectations. In general, the number of farm input establishments in nonmetro areas increased between 1971 and 1981 (U.S. Bureau of the Census 1973 and 1983). Agricultural service establishments increased by 50 percent, trucking and warehousing by 20 percent, miscellaneous business services by 147 percent, and miscellaneous repair services by 73 percent. Nonmetro establishments supplying building materials, hardware, and farm equipment declined by 24 percent. Implicit in the aggregated data is the finding that the number of farm equipment dealers also declined.² There was no discernible pattern of change in the employment-size distribution of these firms.

Changes in the Nonexport Sector

Recent changes in the nonexport component of the rural economy, specifically in export supporting activities, have several implications for farming. The first of these changes is the deregulation of the transportation industry. The disappearance of many branch railroad lines serving farm input supply firms puts the suppliers of such bulk items as fertilizer at the mercy of one mode of transportation. On the other hand, truck freight rates may have declined in response to increased competition resulting from deregulation.

The importance of the transportation infrastructure to farming cannot be denied. The condition of rural roads and bridges affects the movement of farm commodities and inputs as well as the movement of farm equipment among spatially separated farms. At a recent conference it was reported that nearly half of the 460,000 rural bridges in the nation are considered deficient (Voige 1984).

The deregulation of the financial industry also has significant implications for farming. First, all farmers will have increased access to higher yielding investments for their savings. Second, the increased cost of funds to local banks will reduce the implicit subsidy from savers to borrowers and increase borrowing costs. Third, farms, especially larger commercial farms, may be able to acquire financing locally through local affiliates of bank holding companies. Smaller farms may find former financing sources no longer available. Fourth, the loss of community banks and an experienced management sensitive to local farming conditions may hinder capital flows to farming. Finally, banks' inability to be patient with farm loans during times of farming distress (an inability due to the use of market-sensitive funds or new decision rules imposed by external management) may adversely affect farming operations.

Changes in the Export Sector

The recent expansion of new "export activities" in rural communities has numerous implications for farming, especially when these activities are not closely tied to commodity prices or weather. These export activities include service producing businesses (for example, recreation, health care, and information) and transfer payments (e.g., Social Security and welfare). Jobs created by the increased activity can provide supplemental or even major sources of income during difficult periods for farming. Furthermore, these jobs may enable the next generation of farm operators to work near the home place until the current generation retires or, alternatively, to supplement family income in cases where a single farm cannot support two families.

Nationwide, nonfarm wage and salary employment grew at an average annual rate of 2.6 percent in nonmetro counties and 1.5 percent in metro counties between 1969 and 1973. While nonmetro counties continued to grow faster, the margin was 2.5 percent and 2.2 percent per year between 1973 and 1979 (Bluestone 1982). Even though Daberkow and Bluestone (1984) suggest that recent (1976-82) nonmetro employment growth lagged behind metro employment growth, the dramatic growth of nonfarm wage and salary employment signifies several transformations of rural economies. First, the expansion diversifies the export base. Second, the expansion of nonexport activities improves local access to goods and services and the quality of life. Third, the appearance of nonfarm wage and salary jobs may enable many farm families to continue operating on less than full-time farming units.³

Farm and Off-Farm Labor Allocation of Farm Households

As indicated in the section on theoretical constructs, the labor supply of adults in farm households links the rural community and the farming sector in three ways. First, farm persons may be a source of labor for nonfarm businesses in the community. Second, off-farm employment for the farm family may increase total family income, reduce its annual variation, or in other ways enhance family well-being. Finally, farm households, as additional demanders of goods and services, may make it feasible for certain trade or service activities to be provided in the community, as implied by central place theory.

Farm Persons as a Source of Labor

It is definitional that persons who reside on farms supply labor to the farming industry, a traditional export base sector. Most are "employed" on their own farm, as an operator or other adult who does farm work, either paid or unpaid. The importance of farm persons as suppliers of labor off the farm to other export base or nonexport industries is of interest as well. The current circumstances and recent trends in this employment may provide insights for the near future.

In recent decades, the Wisconsin farming sector has shifted away from labor intensive enterprises and substituted capital for farm labor through continued mechanization. Both trends free labor from farming, potentially making labor available for off-farm employment.⁴ Consistent with this, the number of persons employed per farm (i.e., working on farms as farm operators, unpaid family members, or hired labor) decreased from 1950 to 1980 in spite of the increase in average acreage per farm. In 1950, 80 percent of the employed persons who lived on farms were "employed" as farmers on the farm where they lived. In contrast, by 1980 only 60 percent were so employed (i.e., 40 percent of employed farm residents were employed in off-farm employment). Each Wisconsin farm now provides one-half person to the off-farm labor force, compared to one-third person in 1950 (U.S. Bureau of the Census 1952; 1961; 1973; 1983).

These numbers suggest an increasing supply of farm persons to the off-farm labor market; this is not the case, however. The decrease in the number of farms (and farm persons) during that same 1950-1980 period more than offset the increase in per farm off-farm employment. The number of farms in Wisconsin declined 43 percent between 1950 and 1980, from 174,000 to 93,000 farms. The number of farm persons who were employed on or off the farm simultaneously decreased 53 percent, from about 290,000 in 1950 to about 135,000 in 1980. Approximately 4,000 fewer Wisconsin farm persons had off-farm employment in 1980 than in 1950. As a result, the number of farm persons as a labor source for off-farm employment has declined in recent years. This is in contrast to employed rural nonfarm residents in Wisconsin, who increased from 238,000 to 568,000 during that period (U.S. Bureau of the Census 1952; 1961; 1973; 1983).

Nationally, 44 percent of all U.S. farm operators worked off the farm sometime during 1979. The importance of off-farm employment as an alternative source of income varies with farm size (Nilsen 1984). Using data from the Census Bureau's 1979 Farm Finance Survey, Nilsen found that operators of smaller farms (with sales less than \$40,000) were more flexible than operators of larger farms in adjusting their hours of off-farm labor to changes in nonfarm wage rates. A 10 percent increase in nonfarm wage rates yielded a 16 percent increase in the number of off-farm labor hours supplied by the smaller farm operator. The operators of larger farms responded with a smaller increase, given the same change in nonfarm wage rates.

Enhancing Farm Family Well-Being with Off-Farm Employment

The employment characteristics of farm persons relative to the demand for off-farm labor bears on the distribution of income and farm family well-being in two ways. The first is of particular relevance for those who foresee a relatively large movement of labor out of farming in the next few years in response to the current severe farm financial circumstances: that is, how well do the qualifications of farm persons compare with the mix of skills needed for employment currently available in the rural community? Second, would an economic development initiative directed toward the work skills of the relatively large numbers of rural nonfarm persons also have an impact on the farm persons interested in off-farm employment?

Is the mix of employment skills held by farm persons different in meaningful ways from those held by rural nonfarm persons? Apparently not, judging by the current distribution of employed farm persons among Wisconsin industries. While not as precise a measure as the levels of job skills, education, and work experience held by farm and rural nonfarm persons, this distribution provides an overview of the aggregate effect of all the relevant characteristics. In Wisconsin, about 60 percent of employed farm persons were employed in farming, compared with 5 percent of employed rural nonfarm persons. Excluding farming, however, the percentage distribution of farm and rural nonfarm persons among other industries in 1980 is surprisingly similar. For example, 7 percent of both farm persons employed off-farm and nonfarm rural persons worked in the construction industry, and 32 percent of each group worked in the manufacturing industry. Twenty-five percent of farm persons employed off-farm and 27 percent of nonfarm rural persons worked in the service industry (U.S. Bureau of Census 1982).

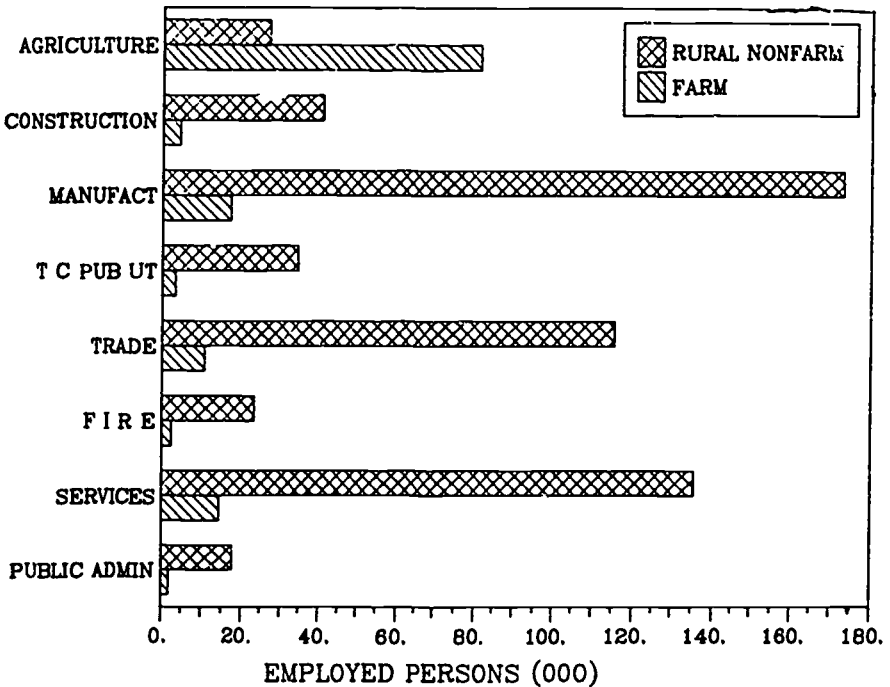
The conclusion in the case of Wisconsin is that at present, the distribution of employed farm and nonfarm persons among industries is not different. On the average, farm persons with off-farm employment have the same mix of labor skills as do other rural employed persons. The implication is that community development programs directed toward creating employment will probably affect farm people employed off-farm and rural nonfarm persons similarly.

Although the percentage distribution among industries was similar, there were about four times as many rural nonfarm as farm persons employed in 1980 (Figure 4.2). In Wisconsin, employed rural nonfarm persons numbered 568,103; the employed farm population was 135,383. Total employment in Wisconsin farming was 108,451, including 81,591 farm people (i.e., persons who lived on farms) and an additional 26,860 rural nonfarm persons, "employed" in farming (as farm operators, adult family members that helped, or hired labor).

Change in Employment by Industry

Further insight may be gained into future employment opportunities for farm persons as well as other rural residents by examining the change in employment by industries over the most recent decade (Figure 4.3). The number of farm persons employed decreased in all industries but one during the decade, thus reflecting the substantial decline in the number of farms and farm adults in the labor force. Gains in numbers of rural nonfarm persons more than offset the decline in farm person employment. Services and manufacturing, for example, were the largest industries in creating new jobs during the years 1970-80 for all rural persons in Wisconsin. Wholesale and retail trade were also very large providers of new jobs.

Figure 4.2. Distribution of Employed Rural Nonfarm and Farm Persons among Industries, Wisconsin, 1980

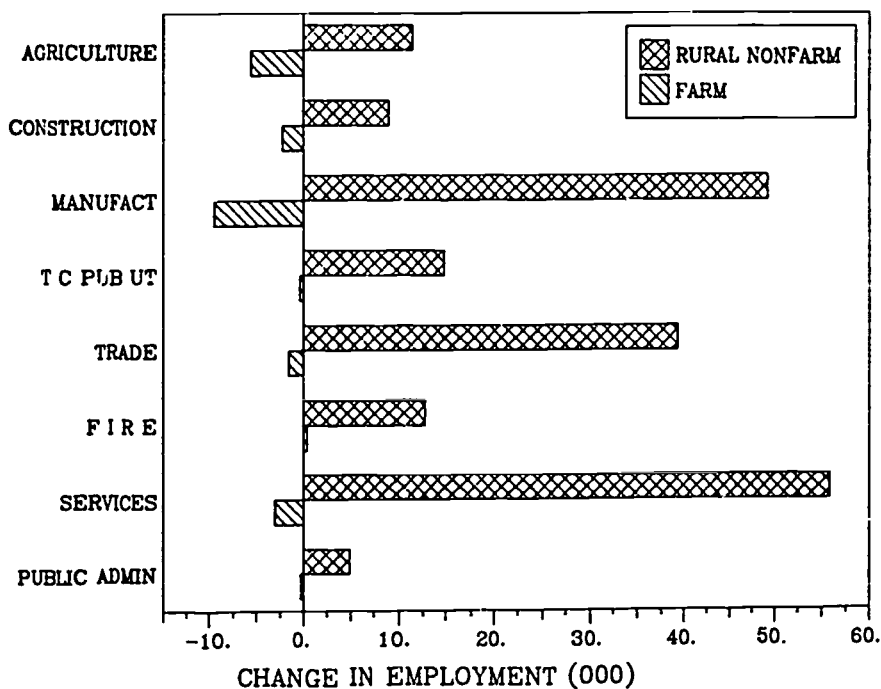


Distribution of Income among Selected Wisconsin Farm Families

The availability of nonfarm job opportunities has distributional consequences for the farm population. Therefore, an analysis of the distribution of sources of income among farm families provides insight into farm family well-being. A family's well-being depends partially on its consumption requirements and also on how its income compares with that of its neighbors. There may be concern by the family or by society not only because low income provides a level of living that is limited in the absolute sense, but also because the level is low relative to the remainder of society. Distribution of income among families has been an important public policy question for many years. It is the focus of the remainder of this section and will be illustrated using Lorenz curves.

The data presented in this discussion are from a 1983 U.S. Department of Agriculture/University of Wisconsin-Madison random sample survey of all farm households in eight southwestern Wisconsin counties. On the average, households reported \$15,260 net cash farm operating income, \$7,200 from off-farm employment, and \$4,760 in transfers, nonfarm asset earnings, and other sources for 1982.⁵ Mean net household income was \$27,130 (Salant et al. 1984).

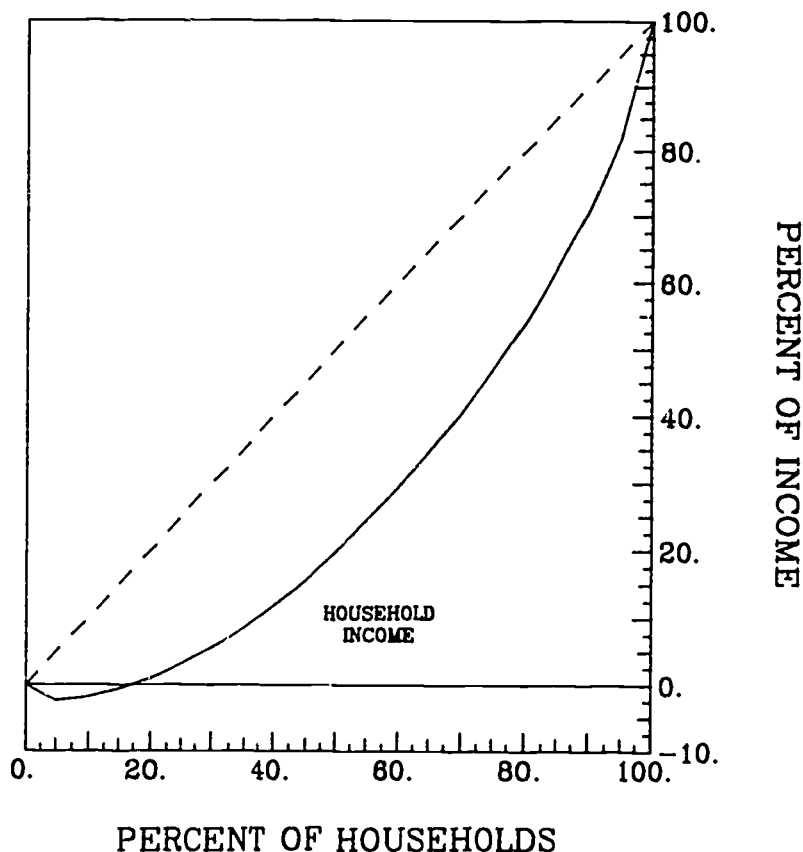
Figure 4.5. Change in Number of Employed Rural Nonfarm and Farm Persons in Wisconsin Industries, 1970-1980



The Lorenz curve in Figure 4.4 displays the size distribution of income (from all sources) for farm families in an eight-county area of Wisconsin. The curve shows the cumulative percentage of families ranked on ascending total household income on the horizontal axis and the cumulative percentage of aggregate income on the vertical axis. If each family received the same income, the curve would be a 45° diagonal line; each decile of the population would receive 10 percent of the aggregated income. But the plotted curve in Figure 4.4 falls to the right of the diagonal, demonstrating that the distribution was not equal. The greater the distance the plotted curve falls to the right of the diagonal, the greater the inequality of that income distribution.

For 5 percent of the households surveyed, large losses in net cash farm operating income and the absence of nonfarm income resulted in negative total household income in 1982. Cumulatively, these households received a "negative" 2.3 percent of aggregated household income. Negative income is reflected by the downward sloping segment of the Lorenz curve in Figure 4.4. The curve slopes upward to the right of 5 percent and crosses the horizontal axis at approximately 18 percent. Thus, the next 13 percent of all households (arrayed by income) reported sufficient positive income to compensate for losses reported by the bottom 5 percent. Cumulatively, the lowest 20 percent of all households received 1 percent of total household income. In contrast, the top 10 percent received 30 percent of all income.

Figure 4.4. Lorenz Curve of Total Household Income Distribution, Farm Households in Eight Wisconsin Counties, 1982



Source: 1982 Family Farm Survey

Impact of Income Source on Equality of Income Distribution

The distribution of any one source of income among families may be more or less equally distributed than is total income from all sources. Some income sources tend to equalize the distribution of total income and other sources contribute to inequality. Knowledge about the impact of income sources on the aggregate distribution of income has relevance, particularly because of public interest in modifying the total distribution. For example, does the nonfarm work of farm families contribute to equality of total income of farm families? What is the impact of transfers and income from nonfarm assets? An extension of Lorenz curve analysis makes it possible to display graphically the impact of each income source on the distribution of total income and to provide insight into these kinds of questions. These graphic presentations are called source impact curves, a concept developed by Weber (Saupe and Weber 1974).

Families are again arrayed from lowest to highest total family income, divided into deciles, and the Lorenz curve plotted as before. (This Lorenz curve is, in fact, the average of the distributions of all sources of income, weighted according to the magnitude of each source relative to total income.) The horizontal axis of this graph continues to be the same as for the Lorenz curve—each unit on the axis represents a given percentage of families ranked on total family income. The vertical axis measures both the cumulative percentage of total income for the Lorenz curve and the cumulative percentage of a given source of income for the "source impact curve." If the source impact curve falls above (to the left of) the Lorenz curve, it indicates that the particular income source is distributed among families in a way that tends to make the total distribution more equal compared to other sources. A source whose curve falls below (to the right of) the Lorenz curve would tend to increase the inequality of the total income distribution relative to other sources. The source impact curves for three major sources of farm household income are presented in Figure 4.5.

The source impact curve for net cash farm operating income is plotted with the original Lorenz curve in Figure 4.5a. It illustrates that the lowest four deciles of farm families (including the 25 percent with losses) received 2.5 percent of net cash farm operating income, while the highest decile received 39.1 percent. The source impact curve is plotted to the right of the Lorenz curve, indicating that net cash farm income tended to increase the inequality of total family income distribution.

Nonfarm self-employment income and wages (earned nonfarm income) was also a major income source for farm families, comprising 25 percent of total income from all sources (Figure 4.5b).⁶ The plotted source impact curve lies to the left of the Lorenz curve, indicating that this source tended to equalize the distribution of total income; that is, nonfarm income permitted poorer farm families to increase their share of aggregated income. Earned nonfarm income was not equally distributed, however. The lowest decile received 5 percent, while the upper half received 73 percent.

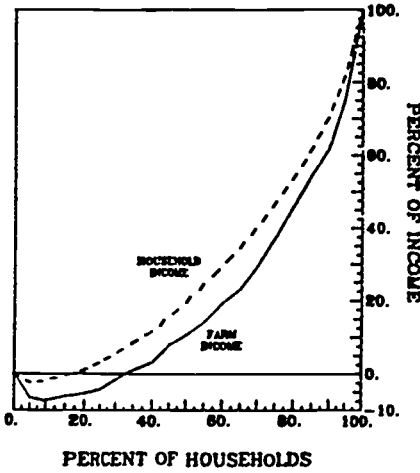
Unearned income (transfers, interest, dividends, nonfarm rent, etc.) also tended to equalize total income distribution (Figure 4.5c). Because these sources were only 17 percent of total income, their impact on the Lorenz curve was less than that of income from nonfarm wages and salaries.

Source impact curves reflect the underlying distribution of productive resources and entitlements. Limited inferences should be made, however, about the effect of changes in the source composition of rural income on the equality of the distribution of rural income unless it is known which part of the distribution (i.e., which deciles) will receive the increase.⁷

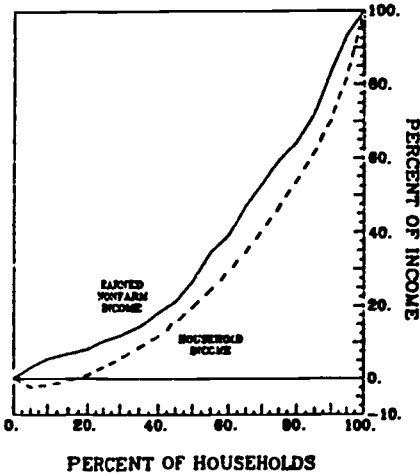
Summary and Conclusions

The theoretical concepts of welfare theory, export base theory, and central place theory help to explain the interaction between farm households and rural communities. This report demonstrates that the link between farms and rural communities is a two-way link beneficial to both parties. There are numerous changes occurring in the broader rural communities, with significant implications for farm households, the farming sector, and farm policy. Clyde F. Kohn (1961) described the rural community/farming relationship: "Farmers stand in the middle of a sequence of urban activities involving those which fabricate and handle necessary inputs and those which handle and process farm outputs."

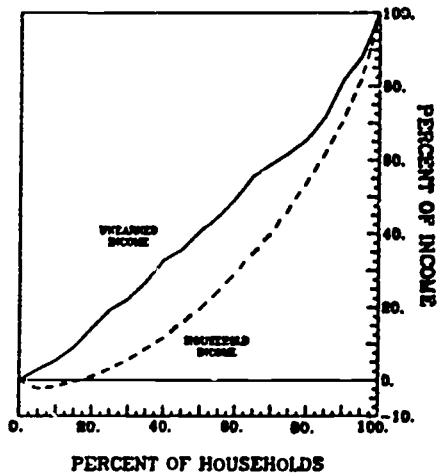
Figure 4.5. Source Impact Curves for Farm, Earned Nonfarm, and Unearned Income, Farm Households in Eight Wisconsin Counties, 1982



(a)



(b)



(c)

Source: 1982 Family Farm Survey

The changing composition of rural employment, income sources of rural persons, and the export base of rural communities document the reduced dependence of rural communities on farming. In more diversified rural economies, the existence of nonfarm jobs and employment creates opportunities for farm families that may permit continuation of existing farming units and a growing population base. At the same time, a diverse rural income base (one

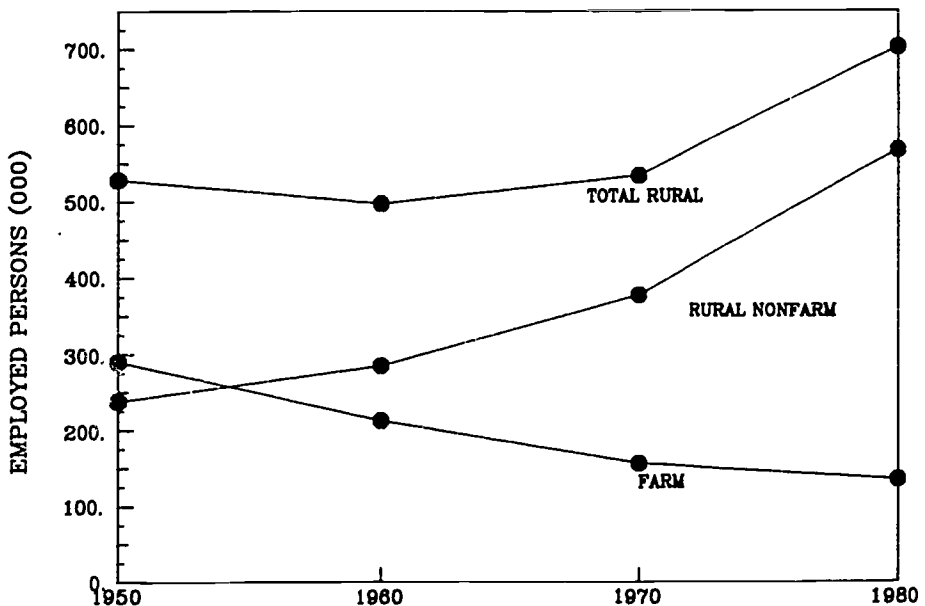
that reduces reliance on farm income sensitive to weather and commodity prices) may enable merchants to continue profitable operations even during less-than-favorable farming conditions.

The repopulation of rural areas and the diversification of their income sources enable communities to maintain or expand the local trade and service sector. In this way local access to consumer products and business inputs can be sustained.

Many of the sectors that were previously thought of as followers of changes in the export sector are leading in the economic change of rural communities. Changes in telecommunications, transportation, and finance will affect the lifestyles of farm families and the profitability of surrounding farms.

Evidence from Wisconsin indicates that the labor supply from the farm population to nonagricultural industries is small in comparison to the total rural labor supply. It may be inferred that a future decline in the farm population will have a small effect on the aggregate rural labor supply. Farm persons employed off-farm appear to work in the same industries as nonfarm persons, suggesting that changes in the industrial composition of the rural economy would affect the demand for labor supplied by farm and nonfarm persons equally. Off-farm earned income and unearned income tend to equalize total household income distribution among farm persons. This suggests that increased opportunities for nonfarm employment and investments among farm persons relatively less well-off may tend to equalize household income distribution (Figure 4.6).

Figure 4.6. Employed Rural Nonfarm and Farm Persons, Wisconsin, 1950-1980



An expanding nonfarm rural economy and farming can compete for the same limited resources, i.e., land, labor, capital, and water. A question arises as to which farmers will be adversely or positively affected by such competition. Heimstra (1984) suggests that expansion of nonfarm activities and increased reliance on off-farm activities will divert time and investment funds away from the farm unit and create long-term difficulties. Another form of farm-rural community competition may occur when local merchants find it more profitable to alter their product lines to serve the new nonfarm population by replacing products that farm families might find more appropriate.

In conclusion, attempts to diversify and develop the economies of rural communities must not be viewed as competitive with a viable farming sector. Care must be exercised in understanding the impacts of the alternative economic changes being proposed on farm families and the rural economy.

As thought is given to changes in federal farm commodity programs and other rural legislation, it is crucial that farming be viewed not in isolation but rather in conjunction with the rural communities that historically have been equal partners in the general well-being of all rural residents. The partners each have something to contribute. Ignoring either reduces the prospects of lasting improvement for both.

Notes

¹A measure of the increased linkage between farms and the nonfarm sector is the index of purchased farm inputs. The index of purchased farm inputs (1977 = 100) increased from 60 in 1950 to 106 in 1982 (USDA 1984b, p. 59).

²Retail farm equipment (SIC 5252) establishment data were not published separately at the state level in 1981 but were included in the more general category, building materials, hardware and farm equipment (SIC 520). The latter experienced a 23.6 percent decline in the number of establishments located in nonmetro counties between 1971 and 1981.

³Osborn suggests "Smaller farms tend to be more dependent on a healthy diversified community economy that can provide supplementary farm family income: that is, the community provides the economic base that allows the small farm to exist. A decline in off-farm income could lead to a decline in small farms."

⁴Between 1974 and 1978, the proportion of farm operators in the nation reporting their principal occupation as "something other than farming" increased by 10 points to 46.5 percent (USDA 1984c).

⁵Nonfarm income is important nationwide also. Banks and Kalbacher (1981, p. 6) report that 43.3 percent of nonmetropolitan families who reported farm self-employment income in 1975 received less than half their total family income from farming. Another 23.9 percent of the families had negative net farm earnings.

⁶National data indicate that between 1978 and 1983 wage and nonfarm proprietor income comprised 69-74 percent of all nonfarm income received by farm families (USDA 1984a, p. 40).

⁷For instance, one should not infer that because the distribution of nonfarm earnings tends to make the total distribution more equal, an increase in the proportion of rural income from this source would tend to improve the income distribution. It depends on who receives the increase. If low income farms families in the lowest deciles can increase their household income by some member starting off-farm work, the inequality would be lessened. But if persons in the top two deciles, who currently receive more than one-third of earned nonfarm income, decide to expand their off-farm work, the distribution would become more unequal.

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Comments on Session I: Will the Real Role of Agriculture in Rural Development Please Stand Up?

Dennis R. Henderson

It was the hope of the planners of this conference that, as participants, we would gain new and greater insight into the nature of both the variables and the functional relationship in the agriculture-rural development equation. The planners also hoped that we would identify priority research issues—i.e. important questions for which we don't yet have the answers—and delineate implications for the structuring and conduct of educational programs aimed at both the agricultural and rural development communities.

The three papers by Hines, Petrulis, and Daberkow; Heffernan and Campbell; and Shaffer, Salant, and Saupe provide a logical starting point for our discussions. The data, analysis, and insight included in these papers help form a foundation upon which we can build a better understanding of the interrelationships between agriculture and economic growth and development in the rural Midwest. They also suggest, both directly and implicitly, the nature of some of the uncertainties and unknowns.

My comments are aimed at (1) summarizing the most salient points on which there appears to be general agreement among the three papers, and (2) raising some questions or issues that seem to me important to our understanding of agriculture's role in rural development but are not addressed in these papers. The first of my purposes speaks primarily to what I, as a scholar of agriculture rather than rural development, perceive as the conventional rural development wisdom. The second speaks to what I perceive to be a "missing blade" of the rural development policy scissors.

Permit me to discuss the papers out of sequence. In the second paper, Heffernan and Campbell briefly review the agricultural fundamentalism theory of rural development that considers agriculture to be the sole source of income for farm families. They quickly move beyond such fundamentalism to suggest that in most rural communities farmers are dependent on nonagricultural sectors for their livelihoods, or "... at most farming is only one of several 'basic' sources of income" in rural areas. Later in my comments I will contest the agriculture-nonagriculture dependency relationship. Nonetheless, I believe that few people would seriously argue with Heffernan and Campbell's view that farming is but one of several sources of livelihood for rural people.

Hines, Petrulis, and Daberkow provide us in the first paper with some very useful data and analyses that strike a convincing blow at the fundamentalism theory, at least for the more than 1,700 nonmetropolitan counties where less than 20 percent of total income is farm-generated. Indeed, they could find only about 230 counties in the nation where farming approached 50 percent as a share of total income. Granted, these counties appear to be concentrated in the North Central region, particularly the western part of the region, but even at 50 percent, this is hardly supporting evidence for the sole source theory. Thus I believe it is safe to conclude that very few, if any, rural communities depend strictly on farming for economic sustenance.

All three papers correctly point out, however, that agriculture is more than farming. It also includes the entire array of sectors that provide production inputs and marketing services to farmers. To this group many of us would add, as did Hines, Petrulis, and Daberkow, the sectors that provide processing, distribution, and marketing service to consumers of products derived in part from agricultural commodities, principally food and natural fibers. While the business linkages and interdependencies between farming and these related sectors are reasonably clear—obvious in the case of farm inputs, as discussed with particular clarity by Shaffer, Salant, and Saupe in the third paper—Hines, Petrulis, and Daberkow show that even with the farm-related sectors included, rural income dependency on agriculture cannot be demonstrated. Indeed, a significant portion of such agriculture-related income appears to accrue to nonrural people.

Let's accept, then, as a theme common to all three papers that agriculture is just one of a number of income growth generators for rural areas, just as it is also a generator of nonrural income, although undoubtedly of less relative importance. An obvious implication is that agriculture cannot be ignored in the rural development equation, but it needs to be balanced with other actual and potential sources of income growth in the development process. This, I believe, we can accept as conventional wisdom.

Let me now move on to my second objective, what I call the "missing blade." Both Heffernan and Campbell and Shaffer, Salant, and Saupe explore in some detail the nature of the linkages between agriculture and rural communities. Shaffer, Salant, and Saupe state their contention that the link "is not one way, but flows both ways," which implies that agriculture not only contributes to, but also draws on, income generated in rural areas. Returning to a point I made earlier, Heffernan and Campbell go even further to strongly suggest that farming is largely dependent upon nonfarm earnings. That is, farming is a consumer, rather than a producer, of income in rural areas. In fact, they go so far as to state that "it is necessary to have some supplemental income [from nonfarm earnings] for the [farm] family to stay on the farm."

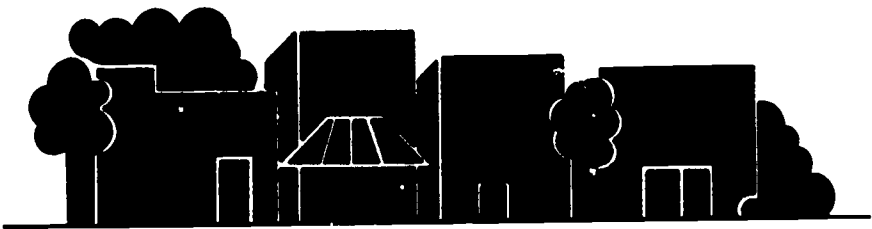
The implication of this kind of reasoning is clear: if a rural community desires to have as part of its social fabric a farming sector, it must generate enough income from nonfarm sources to subsidize it. Evidence is cited of the significant amount of income farm people earn off farm and of the large number of (generally small) farms where nearly all or all of net farm income comes from off-farm sources.

I find this kind of reasoning to be both illogical and offensive. It is offensive because it implies that many farmers are extracting more from the development and growth of rural communities than they are contributing, and it is illogical for two reasons. First, why would a rural community that is interested in development and growth want to maintain a farming sector if it is a drain on the economic resources of the community? It would seem better to encourage these people to quit in order to expand the community's income base. And second, is the economic contribution of the farming sector to growth and development of the rural community made entirely in terms of farm income generated? I think not. Census data cited by Heffernan and Campbell show that about one half of all farm operators report their principal occupation as something other than farming. While available data do not allow definitive analysis, it seems reasonable that most of these people operate farms for which off-farm earnings constitute nearly all or all of net farm income. One has to wonder why these people farm.

Interestingly, the Census of Agriculture shows the number of such farmers actually increased between 1978 and 1982 while the total number of farms declined. Thus, at least in relative terms, nonfarmers who farm are becoming a larger share of farm operators.

Again I raise the question, why? Why do people choose to engage in income-consuming production activities? Undoubtedly, there are social reasons, like the desire to live on a farm. But even that doesn't answer the whole question, since more than 25 percent of these farming nonfarmers don't live on the farm. There must be economic reasons as well. One possible explanation is economic diversity, or the "not-putting-all-of-your-eggs-in-one-basket" phenomenon: i.e., reducing the economic risk associated with single enterprise employment or enterprise entrepreneurship. By having the farm business as an ongoing enterprise, people may be more willing to take the risk of unemployment or lay-off associated with industrial employment or the risk of failure in starting or taking over another enterprise. Indeed, Heffernan and Campbell make this case with their closed shoe and cable factories report. What they don't speculate on is how worse off that rural Missouri county would be if it had not had a number of part-time farms for the unemployed shoe and cable workers to fall back on.

Heffernan and Campbell conclude by asking "which is the tail and which is the dog?" regarding agriculture and rural development. At least by implication, one suspects that their answer is rural development does the wagging. Shaffer, Salant, and Saupe, on the other hand, conclude that the agriculture-rural development link works both ways, that it is beneficial to both the farm and nonfarm sectors. I suggest that one of the important linkages from farm to rural community is the economic security provided by the farm, which helps maintain a base of labor and entrepreneurship upon which community development can be built. I urge the participants in this conference to explore both the research and educational implications of this link.



Session II: Impact of Agricultural Development on Rural Areas

Chapter 5

Natural Resource Linkages to Agricultural and Rural Development

Lawrence W. Libby

There are many definitional problems inherent in this paper topic, indeed in the conference itself. Perhaps these difficulties with the vocabulary of development are precursors to more substantive problems of policy design and action. To avoid slipping into the mire myself, I will specify my own glossary.

1. Economic development—these directed actions designed to alter economic circumstances of people. Success is measured in per capita incomes, gross national or state product, market share, income share, or some other monetary indicator of economic change.
2. Community development—focused change where indicators of improvement include more than economic variables. Feelings of well-being among community members, however that community is defined, might involve a more responsive government, greater opportunity for political access, a sense of having some impact on community change, improved services, or improved economic circumstances.
3. Rural development—community development in nonmetropolitan areas designed to enhance the options for people living there.
4. Agricultural development—community development resulting from changes within agriculture, defined to include all activities from production to retail sales. Community of interest is not limited to rural areas; “improvements” involve more than traditional economic variables.

This paper focuses on the natural resource connection to development, emphasizing, but not limited to, the roles of natural resources in agriculture. It also considers policy—those public actions that affect the rights and obligations of participants in the community of interest.

Roles of Natural Resources in Development

Natural resources, both renewable and nonrenewable, generate value that can be the basis for development. They are the raw materials in products and services for which people are willing to pay. Some of those services may involve direct consumption of the resource (e.g., fish or fuel wood), although most income-generating demand for natural resources is a derived demand through various products that generate utility. A forest has timber to be harvested and processed to produce human shelter. The housing industry is considered a key indicator of economic health in the U.S. Soil, water, and nutrients are essential resource inputs in food production. The list of examples is endless.

The supply of a nonrenewable natural resource essentially represents wealth that may be converted to a flow of income as demanded. Such resources as surface water and air are always flow resources, generating value as they are “captured” flowing by.

Natural resources also have important value on site (Howe 1979, pp. 1-24). These on-site services of natural resources are often overlooked in economic development policies designed to squeeze income from a resource stock. Policy questions in the natural resource connection to development involve more than the rate of conversion of stock to flow. Resources left intact generate direct services that contribute substantially to the economic health of the community. The lake and forest ecosystem of the North Central region, for example, represent long lists of services valued by people, though not easily converted to monetary measure. These and other ecosystems are significant economic assets for the community, assets that may deteriorate and therefore depreciate in value in the absence of reinvestment (Nothdurft 1984).

Policy Setting

Various actions by governments at every level influence the form and flow of natural resource services. To the extent these services may be owned by individuals through ownership rights granted and reinforced by a public authority, private actions responding to perceived market conditions determine the contributions of resources to rural and agricultural development. A farmer buys and sells land, drills for and pumps water, and buys soil nutrients in response to the perceived return to those expenditures in producing goods and services that can be sold. Land is the productive asset, requiring reinvestment to avoid deterioration. The business decision is how much reinvestment to avoid, given that some land may be retired and other land purchased.

The governmental powers to tax, regulate, acquire, and manage may be directed toward affecting natural resource use. Deliberate government actions will affect the types of services and goods produced, their distribution, and the rate of production. Any set of decisions, by government or entrepreneur, to invest in natural resources or convert stock to flow implies a tradeoff between current and future users of those resources. Actions by federal, state, and local governments respond to demand or preferences of the voters and taxpayers involved. In some instances, public action is designed to ensure availability of a natural resource service that is not easily offered by a private resource owner. Various public programs encourage farmers to invest more in soil conservation than they might otherwise. Wilderness areas and wildlife habitat are directly produced by government. In other cases, government actions are designed to protect the rights of individuals and groups against overuse by a few. Land use zoning prohibits land use mixes that destroy certain land services. Government regulations limit fish catch and water polluting actions, both of which may deplete the common property resources of a fishery and the waste assimilative capacity of a flowing stream.

Some public actions that affect the economic value of natural resources are not designed to do so. Certain provisions of the income tax code may encourage land depreciation or depletion of ground water. Income support programs for farmers have often led to higher rates of soil erosion as an unintended by-product of food policy (Libby 1984a).

The Current Issues—Natural Resources and Development

Within the general context suggested above, certain distinct though interrelated issues emerge. These issues involve how natural resources will affect agricultural and rural development, the rate at which stocks of resources are converted to income, policy instruments employed to influence both the form and flow of resources in development, and the consequences for rural people.

Scarcity/Adequacy of Resources

The one consistent conclusion one can draw about the urgency or relevance of natural resource scarcity is that the experts disagree. I am unlikely to resolve that disagreement here. Virtually all resources are scarce, of course, in the sense that there are absolute limits. There is also the important distinction between physical and economic supplies, the latter reflecting willingness to offer quantities of a resource service at a range of prices. Adequacy of any resource input is a function of what buyers are willing to pay for that resource compared with the price expectations of the supplier. A situation of relative scarcity exists when the price of the resource in question rises faster than prices of other goods and services, assuming an open and reasonably responsive market economy. In their path-breaking 1962 treatise on natural resource scarcity, Barnett and Morse (1963) concluded that, only in the case of forestry, have real prices of extractive natural resource-based commodities increased relative to real prices of nonextractive commodities. (They also examined data for agriculture, minerals, and fisheries.)

There are various economic responses to evidence of resource scarcity that tend to mitigate the impact. Producers can substitute renewable or manufactured inputs for the resource in question, while the apparent shortage of fossil fuels has led to the production of alternative renewable sources of energy—gasohol, methane, solar collectors. New production, extraction, or recycling technologies may extend the physical supplies of resources. A primary attraction of conservation tillage is that it requires less fossil fuel, making it a cheaper technology for some crops on some soils. It is the rising relative price of the resource that creates the incentive for adjustment.

Doering (1984) has compared relative prices of selected farm inputs to help analyze the scarcity of the most energy-intensive inputs. Using 1950 prices as the base, he observed price changes that encouraged substitution of fertilizers, gasoline, and farm machinery for both land and labor during the 1950s and 1960s. The situation changed in the 1970s as the price of energy increased dramatically, encouraging farmers to use more labor and less energy. But even through 1980, the price paid for gasoline has increased less than the price for land, labor, and machinery. Contrary evidence of the increasing scarcity of selected nonrenewable minerals was observed by Slade (1982).

There is little evidence of impending scarcity to support aggressive efforts to preserve either the quantity or quality of farm land. Even though land continues to be taken from agriculture for more profitable enterprises, and erosion continues to wash productivity downstream, cheaper nonland substitutes have facilitated increasing levels of food and fiber production (Crosson 1982).

The experts in this matter of resource scarcity have engaged in extended debate on the "so what" implications of data on historic and projected patterns of resource use. After a well-documented and thorough review of projected resource supplies and demands, Landsberg (1964, p. 236) concluded, "There is no reason to expect any widespread scarcity that would raise the real cost of

resources enough to hamper continued economic growth in the United States." In 1977 President Carter directed his Council on Environmental Quality to prepare an assessment of future population, resources, and environment and offer policy conclusion. The "Global 2000" report painted a bleak picture of resource scarcity in the next two decades, concentrated mostly in least developed countries, but with worldwide implications. It predicted that oil and gas, fixed in physical supply, would flow to those nations best able to pay, causing severe shortages and political instability in some areas. The population would approach 30 billion by 2100, the estimated total carrying capacity of the entire globe. It further predicted that forests would be depleted as demand exceeded replacement, and agricultural soils and the environment in general would deteriorate to threatening levels through continuing inattention (Council on Environmental Quality 1980).

Lester Brown (1981b) of the Worldwatch Institute has presented similarly pessimistic predictions for the human race in the 21st century. He has focused primarily on the growing scarcity of food-producing nutrients and water, with a subsequent narrowing of the balance between food supply and demand. He suggests the kinds of technical and institutional changes necessary to accommodate the future (Brown 1981a).

The central feature of the "no sweat" position on future natural resource scarcity is the resource market as a mechanism for anticipating and adjusting to the early signals of shortage. In their counter-document "Global 2000 Revised" Herman Kahn and Julian Simon predict declining scarcity, and a future world "... less crowded, less polluted, more stable ecologically and less vulnerable to resource supply disruption than the world we live in now" (Holden 1983). The mitigating tendencies described by Barnett and Morse are the basic underpinning of the optimists' point of view.

The dramatically different conclusions of the two groups of experts reviewing basically the same data result partly from differing assumptions about population growth, available stocks, technology, and the responsiveness of existing economic and political institutions if allowed to function without government interference. These are questions of science and uncertainty about which scholars often differ. But more fundamentally, and most relevant for the theme of this conference, the experts have deep and profound disagreement on the issue of risk-bearing. Kahn and Simon, writing for the politically conservative Heritage Foundation, have argued that individuals as consumers, producers, and citizens should have the right to make their own decisions on bearing the risk of future food shortages. The market provides an inter-temporal allocator, reflecting pending scarcity and giving people something to do about it. Brown and the staff of CEQ during the Carter years are examples of those who feel that risks of scarcity are too high to be left with the market. They argue that if aggressive public policies and action do not intercede in private transactions, society will work itself into an irreversible "dead zone," one rational decision after another.

Since policy actions taken today to conserve natural resources for future users may retain inefficient technology in the interest of protecting that technology for the future, conservation costs people. Policies to force or encourage soil conservation may discourage further substitution of capital for land, thus forcing today's farmers to abandon it, and consumers may need that soil. Simon would argue that government agencies have no particular advantage in predicting future needs for resources. Buyers and users of the resource are better

equipped and have a far stronger incentive to avoid scarcity by making rational substitutions when appropriate. The counter-argument, and one that I find compelling, is that the social consequence of underestimating future demands for nonrenewable resources would be far more severe than the consequence of overestimating. Society's collective stake in the decision is far greater than the sum of individual impacts by those making market choices. Government's role is to be more cautious than individuals might be. "Recognition of the potential for substitution for exhaustible resources is not the same as certain knowledge of the availability of such substitutes. In the presence of uncertainty, prudence requires explicit consideration of the consequences of exhaustion" (Smith and Krutilla, p. 227).

What is the relevance of all this for the linkage between natural resources and rural and agricultural development? Agriculture, of which food production is a prominent part, is still the primary source of livelihood in nonmetropolitan America. The rate of depletion of nonrenewables—water, land, and minerals—will have important consequences on the location and structure of agriculture and therefore the vitality of rural areas. Soil conservation, however accomplished, is a prudent response to uncertainty. We cannot afford the possibility of too little soil for future production needs. Further substitutions of capital for land should be encouraged so long as the pending scarcity of phosphate, potash, fresh water, and other soil substitutes is accurately reflected in prices. Masking the declining stocks with unrealistic taxes and income subsidies for farmers would be unfortunate, at best. Continued development of production, processing, and distribution technologies is essential to facilitate further substitution of renewables for nonrenewables, or at least more plentiful resources for those that are scarce.

Careful use of natural resources in agriculture and other production activities is important, almost too important to be left entirely with the farmers and other business people making the crucial decisions. In my judgment, the farmer's right to permit soil erosion is ripe for recall. The short-run costs in sedimentation and pollution are important; the long-term loss of productivity is even more so. We have relied too long on the voluntary "money on the stump" approach to soil conservation policy. Further, water allocation based on "first come, first served" in the West, riparian location in the East, and "reasonable use" for ground water will not provide adequate signals of imminent depletion. If it weren't for the rising energy costs of pumping ground water, farmers in the high plains of Nebraska might have missed the fact that the Ogallala aquifer is being rapidly depleted.

Soil and other resource conservation efforts by government must be concentrated on those areas where the present and future economic consequence of conservation is greatest. This will have the long-term effect of further concentrating less productive resources.

Regional Economic Conflict and Natural Resources

Natural resources are key to regional (multi-state) economic differences that determine the general character as well as the competitive advantage of these regions. Regional development policies are being articulated (if not implemented) based in large part on natural resource endowment. Garreau's (1981) perceptive "nine nations" are largely resource defined). Obvious examples of areas with strong natural resource identities are the timber producing region of

the Pacific Northwest, the Great Lakes region and/or the Grain Belt, the Parch Belt of the Southwest characterized by lots of sunshine but little water, and of course the Northeast Frost Belt. Economic opportunities are largely a function of these areas as well, according to Garreau.

The 1974 and 1978 energy "crises" further highlighted resource differences between east and west, north and south. Interregional conflicts were not always good natured, as energy rich areas blatantly seduced business, people, and other economic resources to migrate south and west to avoid "freezing in the dark." These energy-rich areas had the added advantage of low state and local tax rates since coal and oil production generates revenue for public services. Montana has sought to erect a formidable tax barrier to shipments to reflect the importance of this nonrenewable resource to the state's economic future. Mid-western leaders coined the slogan "soil for oil" to characterize the bargaining terms for development. The 1970 Clean Air Act has sharpened differences between high sulfur eastern coal and the cleaner-burning western variety. Subsequent amendments to the Clean Air Act have reduced the western advantage by permitting coal users to install scrubbers that reduce sulfur dioxide emissions, rather than achieve a uniform standard. This was a deliberate action by Congress to improve things for the eastern and midwestern states (Landsberg 1982).

The 1981-83 economic recession (or depression, depending on your location) contributed to interregional differences as many people relocated to seek better opportunities outside of the older industrial cities of the North Central region. Eventually, however, the recession even caught up with "boom regions" as energy demands subsided.

One must be cautious not to make more of these obvious regional differences in natural resource endowment than they deserve. The conflicts may be more form than substance, but they are certainly not new (Rosenberg 1982). Regional resource differences have several implications for this conference:

1. Regional identity is important, particularly in a highly specialized developed economy such as that in the U.S. Even the North Central region, an artifact of convenience for the conduct of the academic enterprise, has a certain amount of natural resource coherence. Our regional identity is agriculture and forestry with all of their ancillary activities. There are other things going on here, of course, but this is an agricultural/forestry region. Those of us who consider ourselves resource economists or some other subspecies of the economics profession have had to acknowledge this reality. There is strength in comparative advantage, and our best strategy is to acknowledge regional identity and make the most of it.

2. There are many linkages between agriculture and natural resources. Resources are both inputs to and outputs from agriculture; availability and quality of natural resources affect the structure of agriculture throughout the region (Libby 1984b). In some cases agriculture destroys resource quality, limiting use for nonagricultural purposes. We in the academic field should make more of our "regionalness" by helping to define the substance of regional resource/agricultural linkages, both positive and negative. The economic future of this area depends on a clear understanding of those linkages. We have focused most of our effort at the state level and have not adequately pursued regional interactions on natural resource policies that affect our economic future. Land and water policies, for example, are often inconsistent and counterproductive across state lines. Environmental standards differ as well. Complete coherence

is neither advisable nor possible; state differences are important and regional government is ill-advised. But greater exploitation of our regional natural resource and economic character through research and education would be an important investment in our economic future.

3. Elected officials of the region, particularly the governors, should establish more formal contact on natural resource matters. A 1977 Midwest Governors' Conference identified water development, energy conservation, energy development, and soil conservation as the most important policy needs—all are natural resource issues (Nothdurft 1984, p. 112). There has been little direct group action on these, but the collective handwringing was useful. A Great Lakes Council of Governors has recently been organized, primarily to respond to a specific inter-regional natural resource conflict: the alleged willingness of the Parch Belt to buy Great Lakes water. It takes conflict to generate action. In fact, this perceived threat from the "outside" has done more to crystallize cooperation among the Great Lakes states than any internal advantage of more positive nature. A charter has been drafted to establish limits on state discretion on use or transfer of Great Lakes water and procedures by which any major action will be reviewed by other states.

In 1984, and perhaps for a long period into the future, the Great Lakes/Grain Belt states face economic crises within agriculture. While the source of the problem is more difficult to define than in the case of the Parch Belt raids, the importance of region-wide cooperation is just as clear.

Natural Resources and State Level Economic Development Policy

Recent economic hard times in the more industrial states of the North Central region have called attention to the natural resource endowment within those states. Many, both in and out of this region, are beginning to formulate deliberate economic development policies with emphasis on natural resource services and commodities. Nothdurft claims that states have been more innovative than the federal government in investing in their natural resource stock. "As they search for workable formulas for economic renewal or for coping with mature economies, many states are re-discovering the economic importance of their resource based industries agriculture, forestry, recreation and commercial fishing (Nothdurft 1984, p. 8). "A survey of the nation's governors . . . in 1983 . . . found that of 17 crucial public policy issues they face in the future, the state executives ranked natural resources number one" (Nothdurft 1984, p. 113). The various policy instruments available to states are being directed toward encouraging private investment in natural resource industries in search of sustained economic development. The impact is not limited to primary resource commodities but necessarily includes the network of input suppliers and output processors as states seek to capture a greater portion of the value added to the commodity before it is exported to other states, regions, or nations.

Several states, including Maine, California, Massachusetts, Texas, Alaska, Montana, North Carolina, and Michigan, have active economic development programs based on natural resources. Michigan is a convenient example for a brief discussion.

Michigan, home of the U.S. auto industry, has been particularly hard hit by the recent recession. Through the mid-1970s, annual investment in industrial plant and equipment averaged \$1.3 billion; exports were \$3.5 billion per year.

the highest in the nation. For various reasons that situation has changed dramatically in the 1980s. Unemployment has risen to and remained the highest in the nation with little likelihood that all or even most of the auto workers can return to work in the same occupation. There are fewer jobs in industry; some components of industry have moved to warmer, less expensive states, and machines have replaced many workers in the plants that have remained (Wood 1984). In 1982, the governor had to deal first with a serious cash flow problem that had left the state close to noncompliance with the balanced budget provisions of the state constitution and nearly bankrupt in the full sense of the term. He dealt with these problems in a direct if politically risky way: he engineered a tax increase. To his credit, however, the governor looked beyond these short-term needs and began formulating an economic development strategy. Its goals were to put people to work, but more fundamentally to reduce the vulnerability of the economy by broadening its base. A "target industry" concept was developed, to focus energy and policy attention on those sectors showing particular promise. Two of the three sectors selected are natural resource based—agricultural processing and forest products. (The third is the production of auto parts.) Agriculture and forestry are, and have been, mainstays of the Michigan economy. The water, soil, and other resources favor farm production, although much of the food processing has been accomplished elsewhere. The northern two-thirds of the state is heavily forested, including 4 million acres of state-owned forests. These lands also serve as the playground for residents of southern Michigan and other states to the south. Tourism is not a designated "target industry," although its close linkage to forest land has helped focus attention on its potential. A consultant's study estimated that 50,000 new jobs could be created within the state for the state's forest products industry, added to the current 63,000, based largely on the underused wood supply. While the validity of these estimates may be questioned (and has been), the important point for this conference is that this natural resource sector is a cornerstone of economic development policy in what has basically been an urban industrial state. The Michigan Department of Commerce has taken the lead in aggressively recruiting new forest products firms, seeking national and international markets for Michigan products, helping existing firms improve the business climate (with particular attention to workers' compensation), and encouraging product research (Gerson 1983).

There is also considerable effort to encourage tourism to take advantage of various on-site services available from the forest environment and the Great Lakes coastlines. There are additional joint product possibilities between tourism and commercial agriculture. On-farm tourist homes apparently have potential. Fruit growers in southwest Michigan have even tried a "rent a tree" program for frustrated urban orchardists from Chicago. The annual Farm and Natural Resources Week at Michigan State University in March 1985 had as its theme "Agriculture and Tourism: Partners in Progress." This is fairly revolutionary stuff for a college of agriculture.

The Lands Division of the Michigan Department of Natural Resources has conducted several public auctions of mineral rights leases for oil and gas reserves located under public land. The department's expressed purpose is to encourage economic development by making these rights available to energy developers. The Geological Survey Division of the same agency is considering

ways to get on this economic development bandwagon in state policy by offering exploration and development leases on various metallic and nonmetallic minerals. There is tentative exploration of diamond deposits.

Michigan State University, as the state's land-grant institution, has been actively involved in the target industry efforts of both food processing and forest products. Our role has been to help sort out fact from "hype," that is to avoid full reliance on the "positive thinking" approach to economic development. There have been various task forces to clarify development problems, identify development options that are feasible, and analyze policy alternatives. Agricultural and forestry specialists from Michigan State have had leadership roles in most of these. The food processing group, for example, has carefully analyzed agricultural subsectors to identify those for which production and marketing conditions favor increased processing in Michigan. Various state regulations that might inhibit expansion of this industry have also been identified (Food Processing 1983).

A large element in any economic development effort is a sort of upbeat, positive, promotional attitude. Economists have long understood that investment decisions depend on one's view of the future. If private investors in forestry and agriculture feel good about Michigan's economic future, they will invest. If they don't, they won't. Declared intention to encourage business is one good indicator of a positive future. But the state should not sacrifice all of its social and environmental gains of the past 50 years to cater to business investors, or much of the attractiveness of living and working in the state will be lost. And a state agency can't magically convert an economic failure into a viable enterprise just through positive thinking or, more important, by spending public dollars to hide inherent risk. There are unfortunate examples of these miscalculations in Michigan and in other states. Interest groups that have fought hard and long for certain environmental and workplace safeguards are not likely to support massive erosion of those attributes.

New York is one of several other states to recently explore economic development possibilities with its agriculture and forestry sectors. New York has added aquatic products—another natural resource sector—to its list of target industries. The mechanism there has been a Governor's Conference, held on November 29, 1984, to publicly highlight economic development potential in the various components of these sectors. University scientists and policy specialists have been a key resource in sorting out the real possibilities (New York State 1984).

Natural Resources, Development, and Quality of Rural Life

This final issue in the linkages between natural resources and development is really a class of interrelated issues. Included are various impacts on the people and revenues in the arena of natural resource-based rural development, the rural areas themselves.

Individual vs. Collective Rights. Economic development strategies imply centralized decisions of such matters as the pace and pattern by which stocks of natural resources are converted to income and farm land is converted to non-farm use. Most natural resources are tangible, fixed in location, and linked to land. Most of the rights to land accrue to the owner fee. The distribution of land rights between owner and a government is a function of various policies undertaken "in the public interest." Public regulation of land use, in the North Central

region at least, has historically been a local government function. Any attempt to shift that authority upward to the state or national level, even to accomplish widely supported economic development goals, will be resisted both by land owners and local governments. I do not suggest that state or national actions are inappropriate—I believe that many such actions are appropriate—but only that there will be resistance. On the matter of farm land scarcity, for example, efforts to require a farmer to stay in farming or even to install soil conserving measures can be a real economic, social, and philosophical burden for the people so regulated. Any attempt to force protection of resource stock shifts income potential from the present to the future. That may be wise on the whole but can be painful for the few asked to forego present income. They are undeveloped in the name of development. Mandatory soil conservation measures could be a severe strain on those farmers unfortunate enough to be farming marginal, erodible lands.

The point for this conference is that economic development policies designed to enhance the public good through "better" use of natural resources could impose hardship on some rural people. Those impacts must be part of the policy choice. The instruments of policy—tax incentives or changes, regulations, acquisition, and payment of market value—imply very different impacts on rural resource owners.

Resource Contamination. Ground water contamination is an issue of major proportion in the more industrial states of the North Central region. The causes include improper disposal of industrial waste, corroding underground storage tanks for gasoline, agricultural waste, and run-off. A valuable service available from water and land resources is waste assimilation. Most wastes will decompose in land and water, given sufficient time. Our whole solid waste management system, so crucial to continued economic development, depends on the natural chemistry of landfills. There are biological limits that, once exceeded, can create real problems that offset any positive impact of the development involved. Ground water contamination is important enough to this region to warrant highest priority in research and education. We need better understanding of causes and cures, both technical and institutional.

There are various risks and uncertainties associated with farm production technologies that have led some scientists to recommend converting to "regenerative" agricultural systems. The issues concern the extent to which chemical fertilizers and pesticides are relied upon and the impact of these chemicals on food safety. The issue also involves who should or may bear risks associated with different production technologies. Strong advocates for organic or regenerative agriculture argue that long term risks of high-tech agriculture are so great that government should undertake more restrictive policies on chemical use or at least encourage research into less chemical-dependent technologies. Those supporting contemporary energy and chemical intensive technologies do not apparently worry about alleged risks and would resist efforts by government to absorb those risks through regulation (Madden 1984).

Contamination of rural resources is an important resource dimension of agricultural, rural, and community development. Since natural resources generally imply absence of people, rural areas may well feel most of these unfortunate side effects of resource oriented economic development.

The Research and Education Agenda

Land grant universities have a crucial role in the formulation and implementation of economic development policy at all levels. As agriculture and natural resources become more prominent foci for development efforts, the land grant role becomes even more important. While we have had some successes, there is far more potential than progress, in my judgment.

In general, extension and research efforts in economic development seem to fit into the following categories.

Sectoral

Much of the experiment station research of recent decades has sought to increase productivity of agriculture and forestry. To the extent that resource efficiencies release physical and human resources for other enterprises, economic development is accomplished. The record in agricultural research is impressive and will likely continue in fields of biotechnology. There is still the challenge of converting laboratory and production results into policy-relevant information. Target industry efforts in several states seek to define useful options by sector—agriculture, forestry, mining, fisheries. The educator's role is to package sectoral analysis results in doses that can be used in policy development by leaders in business, industry, and government.

General Economic Training

Neither Michigan nor Iowa nor any other state exists in economic isolation. Better understanding of macro-economic patterns in the world economy and relationships among parts of the U.S. economy is necessary for effective development policy. In general this is an applied research/extension task, to convert the results of all those Ph.D. theses and textbooks into material that may be understood by decision makers. We need content in the economics and politics development. A state official participating in our in-service training program for Michigan extension field staff in 1984 acknowledged that his interest in development stopped at the state line. His job was to help Michigan and if that occurred at Indiana's expense, that's okay. It is essential to have aggressive positive thinkers in state policy, but that does not account for economic realities. It is doubtful that promotional efforts by any state will increase the size of the economic pie. They will simply share the pieces around. We at least need to understand those economic realities in fairly rigorous fashion.

Locality Specific

Much of the extension effort in this area entails helping a community, a substate region, or a state examine its own comparative advantage. There is plenty of analysis in defining the services and/or commodities that show real promise for a particular place. These efforts include community development efforts to help a central city or a constrained neighborhood of a city brighten its economic future. The research and education efforts are narrowly defined, limited in scope, by design. They are case studies—perfectly acceptable problem-oriented programs. They tend to be expensive, however, because of time and effort focused on a place, with relatively little application to other localities.

Industry or Firm Specific

Since universities are divided into departments and many have a clear commodity orientation, research and education affecting economic development are similarly defined. We have programs in forestry, poultry, recreation, and agribusiness. Each has its political power cluster, economics, biology, and policy setting. Other efforts may focus on the needs of small business or the hotel industry or commercial fishing.

None of the above categories is more defensible or relevant than any other. But effective work in this area requires an understanding of the university. Economic, rural, and agricultural development comes in many forms.

I offer the following final recommendations.

The land-grant university as an institution should marshal its resources to contribute effectively to economic development policy formulation and implementation at the state and multi-state level. The whole is far greater than the sum of its parts in this case. As departments and colleges, we handle these pieces well but have done little to deal comprehensively with policy needs. Land-grant universities exist to diagnose, analyze, and help deal with the most pressing issues of their respective states. There is no more pressing issue in the North Central region now, I believe, than its long-term economic recovery and growth. The university president (or appropriate vice president) should be the catalyst bringing relevant and available social and physical scientists together in a productive format. The present, past, and future may be investigated; feasible options considered; key people involved; and recommendations offered. I know that academicians are not easily directed or pushed to do things. Academic freedom is crucial to me and others in the university. But I feel there is a willingness to help and plenty of unexploited energy. It just takes leadership. To do less is to miss the true strength of our land grant system. Perhaps this group today should specify and communicate this challenge to the 10 or 12 university presidents of the North Central region.

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Chapter 6

Part-time and Limited Resource Farms and Economic and Social Growth in Rural Areas

Eric O. Holberg and Paul Lasley

Despite the tone of optimism expressed over the improved social and economic condition of the nonmetropolitan sector during the past decade, several analysts have voiced renewed concerns about the future of rural development. Paramount among these concerns has been the recognition that the positive effects of the "rural revival," even when it was in full swing, did not occur uniformly across all nonmetropolitan areas (Beale 1982). Preliminary figures from the latest census also suggest that the effects of the recent recession have taken a heavy toll on the nonmetropolitan sector, slowing, or in some cases, halting altogether the unprecedented population growth experienced in rural areas during the decade of the 1970s. In addition, the decentralization of industry to the rural sector, which many counted among the most significant economic trends of the century, began to wane in the late 1970s and early 1980s (Beale 1982). In a recent statement, Wilkinson (1984) has characterized the basic inadequacy and inequality of jobs, income, and services as contributing to a current "crisis of community" in rural America.

Thus, a concern over the social and economic development of nonmetropolitan areas continues to be a prominent issue for social scientists, policy makers, and rural development practitioners. In reviewing the literature on the subject, however, it becomes apparent that setting forth rural development policy and fulfilling rural development objectives has often been accomplished without regard for social scientific models and theories. For example, Copp (1972) argues that while social scientific theories and knowledge can help design techniques for helping to achieve rural development goals, rural development itself cannot be considered as a theoretical concept or even approached as a "scientific" problem because of its inherently "normative" nature. Also, Edwards (1972), in arguing that social scientists have yet to develop a fully integrated model of rural development, demonstrates that policy makers have nonetheless forged ahead in implementing programs that have stimulated growth, claiming this as evidence that a "correct" theory is not essential to problem solving.

It is not the intent of this paper to enter the controversy regarding the applicability of theory or the need for theoretical closure in the area of rural development. Rather, we have set forth the more limited objective of analyzing the relationship between limited resource and part-time farming and the process of development in rural areas. In pursuing this objective, however, one cannot help but be struck by the limited progress that has been made in moving toward a consistent and unambiguous definition of rural development.

Almost all definitions of rural development emphasize in some way the general goal of improving the well-being and the overall quality of life in nonmetropolitan areas. An almost universal element of these definitions concerns

the centrality of employment and income considerations. Redman (1980), in a critique of rural development literature, however, has argued that economists in particular have tended to over-emphasize traditional economic concepts at the expense of subjective, noneconomic elements, with the often implicit assumption that improvement in the former will automatically result in improvement in the latter.

Another point of emphasis found in the rural development literature concerns a preoccupation with the development of "place" rather than "people" (Schaller 1978). Copp (1972) has stated that the ultimate target of rural development should be the improvement of the well-being and self-realization of people, arguing that the development of the institutional infrastructure be seen as a means to attain these higher goals. Implicit in this argument is the recognition that rural people need to become involved in the setting and achieving of rural development objectives. This paper attempts to treat rural development as a comprehensive concept, exploring the reciprocal relationship between two important manifestations of the structural change in agriculture—limited resource and part-time farming—and the institutional, economic, and human development dimensions of rural development.

Buttel (1983) has stated that one of the most significant barriers to the implementation of innovative policies in nonmetropolitan areas has been the tendency to treat rural farm and rural nonfarm populations as analytically distinct and autonomous. This tendency has been reinforced by the fact that academicians and policymakers have been divided into two broad categories—those specializing in agricultural development issues and those specializing in community (nonfarm) development issues. This has resulted in a decreased emphasis on the systemic nature of nonmetropolitan America, i.e., on the reciprocal linkages in the development of the rural farm and nonfarm sectors.

In recent years, a growing number of social scientists have attempted to bridge this gap by exploring the impact of changes in agricultural structure on the rural community. Following in the Goldschmidt (1978) tradition, these studies have almost universally documented the deleterious effect on local communities of the major structural changes that have taken place in agriculture (Heffernan 1982). Curiously, however, very few studies have systematically examined the impact of the changes taking place within the rural community on agricultural development (Buttel 1983). We argue that social scientists need to move beyond a unidirectional model in attempting to understand the relationship among limited resource farms, part-time farms, and rural development.

Coughenour and Wimberly (1981) have advanced several reasons for conducting sociological research on small and part-time farmers; some of these reasons are related to overall rural development. Stating that the improvement in rural family and community well-being involves small and part-time farm families, they point to small farm productivity potential and claim that limited resource farms offer supplementary employment for such groups as the elderly, who might otherwise depend upon welfare or limited pensions. They also point out that limited resource and part-time farmers are integral parts of the rural community and that strengthening their socioeconomic position advances community viability.

The interdependency between agriculture and community becomes more evident in periods of stress or crisis (Lasley and Tait 1984). It was only after the energy crisis in the mid-1970s that we fully realized the extent of agriculture's dependency on fossil fuel. The financial crisis in farming provides a good backdrop for examining the relationships between limited resource farms, part-time farms, and rural communities. Based on recent national and Iowa surveys, it appears that the financial crisis in agriculture dwarfs the energy crisis (Lasley 1984). Estimates from these studies show that about 20 to 30 percent of the nation's farmers face very serious financial stress and that many are not expected to be able to continue farming unless very drastic measures are taken. In Iowa almost 12 percent of the farmers have debt-to-assets between 40 and 70 percent.

The adoption and consequences of new technology in farming have proved to be a fertile area of study and debate for rural sociologists. The capital intensification of U.S. agriculture has been one of the more profound trends in agricultural development. A key indicator of modernization and agricultural development has been the capital intensification or the increased ratio between capital and labor. The substitution of capital for labor is the stalwart USDA indicator of agricultural development. While the number of persons fed per farmer has been the too-frequently-quoted statistic of agriculture's productivity, this measure unfortunately fails to account for the increasing capital investments that make it possible for one farmer to feed 75 others.

The substitution of capital investments for labor by way of ever-larger machinery, facilities, and production systems has resulted in a very heterogeneous farm structure with the enormous productive capacity of capital-intensive farming contributing to the current commodity glut. In addition, those farmers who expanded their operations and invested heavily in capital improvements are now paying the costs of their capital dependent production systems. Those with high debts incurred by borrowing capital for expansion are in financial crisis, because suddenly capital became more expensive as the Federal Reserve System tightened the reins on credit to bring inflation under control.

However, there are farmers who are not in financial trouble and some who are doing quite well under existing economic conditions. First, there are those farmers without debt. Because of family wealth or because they bought land and equipment before the price of capital escalated, they are in strong financial positions. A second group that is relatively immune from the farm crisis comprises the part-time farmers whose part-time, generally off-farm, jobs help protect them from the high costs of capital and the vagaries of the markets. While they are still being buffeted by the larger economic forces, their off-farm incomes help to level out the waves of the economy. Although often not by choice, limited resource farmers make up a third subgroup of farmers that is protected, to some degree, from the financial crisis. These farmers, either by choice (e.g., making a conscious decision to remain small and hence out of debt) or circumstance (judged as bad loan risks and unqualified for loans), are insulated from the financial crisis. On the other hand, the part-time and limited resource farmers are adversely affected by the financial crisis in terms of declining asset values, especially in the land market and in the prices they receive for their products. Before further exploring the ties that these three subgroups have to the local community, we need to develop a clear understanding of their characteristics.

At the most general level, the USDA continues to struggle over definitions of farm types. The latest census-based farm definition is any unit that sells or normally would sell at least \$1,000 in agricultural produce. There are many "units" that have the capacity to produce \$1,000 in agricultural goods—an ambitious home gardener, a marijuana grower, a 4-H club member who sells his/her prize show calf, a multi-national corporation, or a commercial Iowa corn grower. There is consensus, however, that the capacity to produce or the occasional production and marketing of goods is an incomplete definition.

The category of "limited resource farms" includes farm families with low income or with limited capital to expand their farm operations. This category has been equated generally with "poor" or "poverty-stricken" farmers, but the association is often indiscriminately extended to include all small-scale farmers. It is erroneous to assume that all small farms are the result of limited capital or low income. Small-farm operators are a very heterogeneous group (Heffernan et al. 1981) including various levels of income and wealth. However, limited resource farmers are generally defined in terms of income.

While income is the most common indicator of limited resource farms, there are other important resources that can limit farmers' production. Rather than focusing just on income, we propose a farm typology based upon several inputs to the production process. Using essential inputs or resources for production as a classification system reduces some of the ambiguity of past research. In addition to income, other resources that will be considered are labor and management (Vogeler 1981). Obviously, other inputs such as land ownership, are also important (Rodefeld 1974).

Labor and farm management skills are endogeneous to the family system. The family is a source of human capital as well as investment capital, represented by either income or credit. Using these variables, a limited resource farm could fall into one of three categories: those with insufficient investment capital; those that lack sufficient labor; and, those that lack adequate farm management skills.

If family labor limits production, three options are available. The family labor pool can be enlarged by increasing the size of the nuclear family or incorporating members of the extended family. This was the major avenue open to 19th century farmers—the larger the number of children, the more land one could farm. A second, more realistic, method of dealing with family labor scarcity is to substitute capital investments for labor. A third option for dealing with this limitation is to hire nonfamily labor.

An operation in which the farm family lacks adequate farm management skills that limit or reduce production can also be categorized as a limited resource farm. Historically, the solution for inadequate management skills has been the mission of the Cooperative Extension Service, vocational agricultural education, land-grant colleges, FFA, etc. A limited resource farm might also be described as one with insufficient investment capital. The limited resource farm label has generally been applied to families with insufficient capital to establish or maintain a viable economic farm unit, i.e., those who do not generate enough profit for reinvestment capital or cannot borrow against future earnings. Such families are generally low income. As a result, capital deficient farms are one type of limited resource farm and often are referred to as low income.

The Joint Council on Food and Agriculture Service (1979) set out three criteria in defining a small farm: (1) family net income from all sources (farm and nonfarm) is below the median nonmetropolitan income of the state; (2) the family is dependent on farming for a significant, though not necessarily a majority, of their income; and (3) family members provide most of the labor and management. However, numerous problems creep into this definition. The first is the assumption that small farms are necessarily low income. Other problems include specifying what is meant by the family being dependent upon the farm income for a significant part of their income. Likewise there is much ambiguity about what constitutes "most" of the labor and management (Coughenour and Wimberly 1981).

Marshall and Thompson (1976) define small-farm operators to be families or unrelated individuals whose incomes are no more than 100 percent greater than the official poverty threshold and who receive at least one-third of their income from farming. Again this definition places restrictions upon the amount of family income and limits small-farm operators to relatively low income (100 percent of the poverty threshold). Obviously the high income small farm is not a social problem, nor is the small farm that is maintained for a tax write-off or as a leisure time pursuit (hobby) or a retirement residence.

However, using farm size as a criterion to define small farms is inadequate (Heffernan et al. 1981, Vogeler 1981). Given land quality differences that affect productivity, farm size is at best a regional or relative measure of size. Using a comparative measure of income such as percent of the poverty threshold, as Marshall and Thompson (1976) suggest, does permit one to identify those farms that represent a social problem. Unfortunately, farm income measures are difficult to find and, given the tax structure of farming, these statistics are often unstable.

A Conceptual Framework for Classifying Farms

From the foregoing, it is obvious that a conceptual framework that accurately classifies farms and reduces some of the ambiguity is needed.

To facilitate the formulation of a farm typology, one method is to examine farm types by part-time versus full-time activity. Thus Figure 6.1 presents one system of classifying limited resource farms. In the first matrix the relationship between capital and full-time versus part-time farming is presented. Much has been written about the low-income, full-time farmer, represented in the figure by quadrant 1. Quadrant 3 represents the low-income, part-time farmer. Those farmers represented in quadrants 1 and 3 are aptly defined as limited resource farmers, where capital is the limiting factor of production. For comparative purposes, those farmers in quadrants 2 and 4 do not meet our definition of limited resource farmers.

The traditional view of agricultural development emphasized facilitating movement out of quadrant 1 into quadrant 2, with the thought that the way to help small farms was to gear programs toward making them larger, more commercialized, and hence more competitive in the economic marketplace. Likewise, from a traditional perspective of viewing part-time farmers as a transitional category, where off-farm employment was seen either as a mechanism for raising investment capital or as a means of exiting farming, emphasis was placed on facilitating movement from quadrants 3 and 4 into quadrant 2 or, alternately, out of farming altogether.

Figure 6.1. Relationship between Capital and Farming Activity

		CAPITAL	
		Low Income	High Income
FARMING ACTIVITY	Full-Time	1	2
	Part-Time	3	4

From a development perspective, however, many development experts are calling for programs that would direct movement from quadrants 1 and 3 into quadrant 4, with the recognition that part-time farming is a permanent feature of today's agriculture and that it represents a viable structural alternative in today's nonmetropolitan areas (Coughenour and Gabbard 1977; Pearlberg 1980; Heffernan et al. 1981). It can also be viewed as a potential key to rural development efforts (Paarlberg 1980; Fugitt et al. 1977; Persson 1983). From a human development perspective, these farm families present a need for training and educational programs to enable them to acquire skills to supplement their farm income by off-farm employment. These programs must be implemented with an eye on the rapidly changing occupational structure in nonmetropolitan areas as we increasingly move away from the industrial boom of the late 1960s and the 1970s to the service-based economy of the 1980s and beyond (Beale 1981). From a rural development perspective, the focus is on the creation of off-farm employment opportunities so that low-income farmers may raise their incomes and generate investment capital (or at least the ability to borrow capital) to expand their farm enterprise or shift into alternative enterprises to facilitate movement into quadrant 2.

Figure 6.2 presents a graphic display of the relation between labor—a potentially limiting factor of production—and farming, either part- or full-time. Some theoretically important categories are represented in Figure 6.2. Quadrant 1, the full-time farmer with insufficient labor supplies, represents the justification often used for more technology, especially labor-saving machinery. In this case, the family is trying to farm full time with insufficient labor; as a result labor scarcity is overcome by the adoption of new technology. Quadrant 3 represents the unusual case of part-time farming, but with insufficient labor. This situation, when it does occur, would probably exert pressure on the operator to adapt to the labor shortage by either increasing his off-farm commitment, with a corresponding decrease in the scale of labor intensity of his farming operation, or by the adoption of labor-saving technology. The rural development problems of underemployment and unemployment are represented in quadrants 2 and 4.

Generally it is thought that underemployment is a problem on farms where excess labor is available during certain times of the growing season. This typology, of course, does not take into consideration those farming operations where the labor needs are sufficient to the individual's commitment to farming, a case in which we would expect little pressure to change.

Figure 6.3 relates management skills to full and part-time farming. Farm management skills are a human development problem. Regardless of whether farming part-time or full-time, the training needs represented in quadrants 1 and 3 are the focus. This has been the historic mission of the Cooperative Extension Service and other agencies involved with improving operators' farm management skills.

The utility of this typology for rural development lies in its ability to shed light on the process by which farmers adjust to problems brought about by deficiencies in capital, labor, and inadequate management skills. In other words, it is not a static typology, but dynamic in the sense that it suggests alternatives for

Figure 6.2. Relationship between Labor and Farming Activity

		LABOR	
		Insufficient	Excess
FARMING ACTIVITY	Full-Time	1	2
	Part-Time	3	4

Figure 6.3. Relationship between Management and Farming Activity

		MANAGEMENT	
		Lacks Skills	Adequate Skills
FARMING ACTIVITY	Full-Time	1	2
	Part-Time	3	4

movement between the identified types and advances some of the implications that this type of movement holds for rural development.

As with any typology that attempts to reduce the complexity of a phenomenon with the hope of stimulating discussion, it is not complete. First, dimensions other than the ones used here, such as farm size or determining who controls the land and nonland capital, could be used. Also, there is a great deal more complexity and variability in each of the criterion variables than has been suggested up to this point. Obviously, the use of such general categories as full-time and part-time farmers belies the existence of the heterogeneity known to exist within the categories (Buttel 1983). The need to move beyond these broad categories into a further specification of concepts and the development of more refined subtypes (Fuguitt 1961) is clearly indicated. For example, in discussing the part-time farmer, no effort is made in this typology to delineate the appropriate unit of analysis. Considerable attention has recently been directed to the need for scrapping definitions of a part-time farmer in which the operator is treated as the sole unit of analysis and replacing them with definitions focusing on the farm family as the appropriate social and economic unit (Cavazzani 1977; Gasson 1977; Fuller 1983). Also, there is no attempt in this typology to measure commitment to farming by using an indicator such as days or hours of off-farm work. Our hope is that a simplified typology, like the one proposed here, will have heuristic value in suggesting potential linkages between agricultural structure and integrated rural development efforts.

Several important linkages exist between limited resource and part-time farmers and rural communities. The traditional solution to limited resource farmers and part-time farmers has been to encourage farm expansion through capital investments (Young and Nelson 1980). As such the solution was either to expand the scale of operation or exit the industry. This position viewed small farms as a transition stage either to entry into farming as a full-time vocation or as a scaledown movement toward eventually leaving farming (Heffernan et al. 1981). However, in light of the growing evidence that small farms are increasing and that many small part-time farmers have no intention of becoming full-time operators (Williams 1981; Coughenour and Gabbard 1977), it appears that small farms are a permanent farm class. Part-time farming continues to increase and the available evidence suggests that it is becoming a permanent feature of U.S. agriculture.

This trend suggests that future rural development will need to integrate what has previously been called agricultural development and economic development (Buttel 1983). Rather than treating agricultural and economic development as somehow separate or distinct activities, they will need to be merged. Rural development must first acknowledge the emergence and persistence of small farms and devise strategies to incorporate economic development objectives into the existing agricultural structure. A crucial test for rural development activities will be the degree to which they can provide options and alternatives to families who desire to live and work on small farms. It is economically unlikely and perhaps even socially undesirable that all small farms or limited resource farms be placed on the conveyor belt that moves them toward an increasingly capital intensive production system.

Rural development efforts should examine the needs of farm families and what human and natural resources they can provide to the economic and social development of the community to which they are inexorably linked.

It is important to be able to distinguish between the final goals of development activities. Agricultural development is oriented to food production, whether measured by calories per capita or bushels of grain or tons of meat. Economic development and human development are much more broadly defined and involve people, whether measured in employment, leadership skills, or efficient organizations and systems. Rural development must link food production with both human development and economic development. This linkage can best be seen in the case of retail trade in agricultural communities. Generally, agribusiness firms are interested in volume of sales and/or volume of commodities handled, processed, and marketed. For example, it makes little difference to the wheat miller whether 100 or 1,000 farmers produce the wheat they process. Only in such specialized commodities as fresh grapes or tomatoes does the agribusiness firm care whether the crop was produced by machine or by human labor. Similarly, consumers rarely seem to ask whether the contents of their shopping cart were produced by human labor or by machine, on a small farm or on a large commercialized operation. There are exceptions, for example, among organic food connoisseurs, but even in this case the absence of chemicals seems of more concern than whether it was produced in a factory or on a farm.

However, people are the focus of economic and human development. For those businesses, retail establishments, and community institutions that serve the needs of people, the farm population and hence farm numbers are important. To local grocers, clothiers, medical practitioners, school teachers, clergy, and local voluntary associations, the needs of people are paramount. The decrease in farm numbers has not reduced agricultural production, but it has had devastating impacts on many rural communities through a decrease in the number and diversity of retail stores, the viability of local schools and churches, etc.

On the relationship between community and farm structure, Firey (1984) suggests that small farms can be a means to enhanced security and sufficiency. However, for small farms to exist, other rural development dimensions must also be present, including off-farm employment opportunities, technical assistance, access to markets, credit, transportation, storage, and other components of the infrastructure. Without these broadly defined community services, it will be difficult for small farms to continue.

Rural development strategies should provide a set of institutional and organizational arrangements that ensure the continued existence of small and part-time farms, recognizing the crucial role that these farms play for the social and economic vitality of the rural community.

Benefits of Small and Part-time Farming to the Community

There is a need to stimulate additional empirical research that specifically explores the relationship between limited resource and part-time farmers and rural community development. While the last few years have seen an increase in the number of studies analyzing the association between farm scale and such things as community participation, there is a dearth of studies examining the impact of increasing numbers of part-time farmers and rural development.

Since the paper by Heffernan and Campbell at this conference treats the former, we will deal primarily with the part-time farming operation. The limited number of studies done on part-time farming and rural development has focused on both economic (Fuguitt 1958; Persson 1984) and noneconomic (Coughenour and Christenson 1983; Buttel and Larson 1982; Heffernan and Lasley 1978; Heffernan et al. 1981) community development issues.

Heffernan et al. (1981) analyzed attitudinal differences between full- and part-time farmers with respect to community attachment, reasons for living in a rural community, development orientations, and tax expenditure preferences. The major differences between these two groups were found among recent migrants, where part-time farmers tended to be more attitudinally integrated into the local community than full-time farmers. Among longer term residents, few differences between full and part-time farm operators were found. Based on these results, the authors were led to conclude that part-time farmers did not disrupt the local community by introducing elements from the larger mass society, but rather were absorbed into communities that were already well integrated into the larger urban milieu.

In the other major sociological study of part-time farmers and the local community, Coughenour and Christenson (1983), using a social class framework, found the most consistent differences in values, policy support for small farms, and attitudes toward local community growth to exist between small and large scale full-time farmers. Extending the class analysis to part-time farmers, they discovered blue-collar part-time farmers to be more supportive than white-collar part-time farmers of policies geared to small scale farmers and to general growth orientations. Unfortunately, neither of the two studies considered measures of behavioral integration into the local community.

An important element of these studies is the recognition that part-time farmers constitute a heterogeneous category and that at least for certain rural development activities the differences between full- and part-time farmers may not be as meaningful as differences within each of the categories.

These findings suggest the importance of developing a typology of part-time farmers along several different dimensions. One of the most important and fruitful dimensions for future research concerns off-farm occupational status. Cavazzani (1976) has noted that the analysis of part-time farming has generally been carried out by students of agricultural structure and hence has focused on the farm unit. Increasingly, however, part-time farmers are more closely identifying themselves with their off-farm status, particularly among the rapidly growing segment categorized as "hobby" farmers. Occupational and educational status have consistently been shown to bear a positive relationship to participation and involvement in community affairs. It seems reasonable, then, to classify part-time farmers according to these criteria in analyzing their commitment to a full range of community development activities (Coughenour and Christenson 1983). Studies that focus on occupational and educational status would also provide policy makers and planners with a better idea of the potential of part-time farmers in adapting to the occupational structure. Industrial and economic planners obviously need to know more about labor force potential than merely employment and unemployment rates. There must be an attempt to match employment opportunities with the skills that people bring to the labor market, and studies of this type could help illuminate the diversity in skills among persons in the part-time farming category.

We have commented before on the need to view the family as the unit of analysis when discussing part-time farming. This seems especially appropriate when examining the relationship between part-time farming and rural development. Only focusing on the occupational status of the operator ignores an extremely significant linkage between farm structure and the development potential of nonmetropolitan America. This is true not only because of the rapidly growing number of farm women entering the labor force but also because of the increasing recognition of the significant role that they play in the farming operation—a factor that could be critical, for example, in the ability of the male operator to move into a nonfarm occupation.

Implicit in this recognition is the need to explore stages in the family life cycle as a variable in the rural development equation (Fuller 1983). Historically, the potential labor force involvement of the woman was shown to be closely related to family cycle in that involvement was highest among younger married women, prior to starting a family, and again after the children were grown and in school. Currently there is an increasing trend toward women's more continuous involvement in the labor force, a fact that predisposes us to examine other rural development requirements, such as the need for child-care programs and related issues in the nonmetropolitan sector.

Community Impacts on Small and Part-time Farming

Numerous rural development actions are needed to provide small farm options to rural families; for example, cooperatives, which can play an important role in fostering the viability of small farmers. The historic mission of farm cooperatives was to help small farmers gain market power, although many cooperatives are accused of behaving much like private firms (Kravitz 1978). However, farm supply and farm marketing cooperatives are needed to ensure competitive prices for small farms. Credit cooperatives and credit unions could provide needed capital for small farmers. Green (1984) has recently noted the trend toward multi-bank holding companies and the policy implications of the centralization of the banking industry. Federal Land Bank and Production Credit Association as credit cooperatives could play an increasingly important role in small farm development. Other cooperatives that can contribute to rural development are utility cooperatives—such as electric, gas, insurance, and water—designed to provide services to farm families.

Another growing opportunity for cooperative activities is in the marketing of agricultural products. Assembly points, cooperative marketing, and transportation need to be present to foster small farm development. Increasingly, vertical integration and production contracts are reducing the number of available markets for farm products, especially for small-scale producers. Perhaps the cooperative spirit is best seen in the organization of farmers' markets, linking producers and consumers.

Consumer food cooperatives that provide an outlet for locally produced goods are yet another example of rural development linking agricultural and economic development. Cooperatives can contribute greatly to small farm development through ensuring market access and market development.

Other community linkages relevant to agricultural development can be seen in restrictions on land use and water rights. Zoning farmland to protect it from urban encroachment is direct intervention to ensure opportunities for local food production. Regulating water use and abuse can limit exploitation of this natural resource, possibly even giving priority use to small farms.

Another rural development action to foster small farm development is agricultural education. The major goal of the Cooperative Extension Service, 4-H, and FFA chapters has been to upgrade the skills of farmers. These institutions occupy a central role in providing technical information and assistance to small farm operators in rural development processes. However, recent criticism that extension has been preoccupied with the needs of corporate agriculture (Hightower 1973) has forced these institutions to recognize that their future may very well depend upon the continued existence of small family farms.

Finally, rural development must be involved with rural employment. Studies have consistently demonstrated a link between the incidence of part-time farming and the availability of off-farm employment opportunities (Fuguitt 1959; Bennett 1967; Albrecht and Murdock 1984). Rural industrialization is central to the continuation of the trend toward increased part-time farming. Local development must start with available natural and human resources. Not every village or town will be able to attract a computer chip manufacturer or other high tech industry. However, in those communities surrounded by farmland and people with farm skills or interests, it seems a sound strategy to create jobs in food processing, packaging, marketing, or in other agriculturally-related industries.

Rural development programs should strive to foster off farm jobs for part-time farmers. Because of the seasonality of farming in most crops, mixed enterprises and agricultural diversity are necessary; corn and soybean farmers in the Midwest are currently learning some harsh lessons about monoculture. Rural industrialization should attempt to diversify the local employment base of a community. To create additional jobs in just one plant or industry is to climb aboard a roller-coaster. The effect of the roller-coaster in corn and soybeans and in energy boom towns will be continued if development does not bring diversification (Wilkinson 1984).

In assessing the impact of community development on the limited resource and part-time farmer, it must be emphasized that the modern community is inexorably linked to external sources and that decision making relative to the types of activities outlined above often will be made outside the local community and with limited community input (Vidich and Bensman 1968; Warren 1972). Thus, it becomes imperative to broaden the perspective to include the regional, national, and even international dimension in assessing these impacts (Buttel 1983).

Undoubtedly an average urban consumer would ask why society should care about the rural community, much less the small or part-time farmers. Many long-winded discussions have been held over the years about the merits of small farms to consumers. If we all search our libraries we can find references to Thomas Jefferson, Liberty Hyde Bailey, and even some contemporary orators who have tried in vain to convince urban dwellers that it is in their best long-run interests to save the family farm and to ensure low cost food. Many urbanites share values and beliefs about the tranquility of farm life and the nostalgia of rural communities (Buttel and Flinn 1975). Food costs, however, tend to overshadow these virtues of agrarian life. In light of the unsuccessful attempts made to persuade urban dwellers that they should support the development of small farms, we doubt that future efforts will prove any more successful. As more and more of the U.S. population becomes even more removed from their once agrarian roots, it will even be more difficult to convince urbanites to take up the cause of small-scale farmers.

It is past the time for rural residents and farmers to begin to act on their own initiative to develop their communities. Regardless of the evidence that can be garnered to argue for more government resources and urban support to develop rural America, it is likely to fall on deaf ears, especially under the current federal deficits. Rural residents, farm and nonfarm community residents alike, need to cooperatively develop their own agenda of what they want their community to look like. A guiding principle in community development is that local people must initiate and be involved in the process. Rural people need to define their agenda for local development.

While much social science research has examined the community consequences of changes in agriculture, a new research agenda that focuses on the reciprocal process (i.e., understanding how communities can affect the structure of the surrounding agriculture) is very much needed. Through the increased understanding gained through studies of this type, sociologists, economists, and community development practitioners could instruct and assist communities in fostering small and part-time farm development through showing the mutual benefits of this reciprocal process.

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Chapter 7

Impact of Agricultural Development on Socioeconomic Change in Rural Areas

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Many rural communities in the North Central region rely on agriculture for much of their economic base (Bluestone 1979; Jordan and Hady 1979). Although U.S. agriculture is among the most efficient economic production systems in the world, the attainment of this efficiency has often led to reduced labor demands and to a subsequent decline in population and related needs for rural services. With economic conditions continuing to deteriorate for the agricultural industry, many questions are being raised about the future of rural areas dependent on that base. An examination of available literature on economic forces shaping agriculture and on the effects of changes in agricultural production on socioeconomic conditions in nearby communities can provide insights about the future of such areas.

The purpose of this paper is to evaluate the effects of agricultural development on socioeconomic conditions in rural communities. Before these effects on community growth and change can be addressed, however, it is important to define what we mean by agricultural development. The concept of development has been used differently in describing changes in the agricultural and non-agricultural sectors (Summers et al. 1976; Tweeten 1983a). In both contexts, however, development generally implies increases in total output and/or the efficiency of production (i.e., greater output per unit of all inputs). Although development in a nonagricultural setting is usually associated with an increase in the use of both capital and labor resources, agricultural development has often involved substitution of capital (in the form of machinery and other purchased inputs) for labor so that increasing levels of output are produced by fewer people (Tweeten 1979). Thus, while industrial development and resource development (such as energy development) conjure up images of new facilities arising in rural areas and attendant population growth (Leistritz and Murdock 1981; Murdock and Leistritz 1979), agricultural development can occur as a result of a variety of factors. Each of these causes may have somewhat different implications for nearby communities.

At least three causes of agricultural development can be identified. First, agricultural development can occur as a result of an increase in the intensity with which labor and/or capital resources are applied to a unit of land. A shift from dry land to irrigated farming is one example of this type of development; emerging developments in biotechnology and genetic engineering may create other opportunities for intensification. The conversion to irrigation farming usually means a substantial increase in capital requirements (e.g., for sprinkler

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systems) and more intensive applications of fertilizer and agricultural chemicals. Labor inputs per acre generally also increase, but this increase may be partially or completely offset by general trends of agricultural mechanization or by the initial underemployment of many farm operators. Hence, total agricultural employment in the area will not necessarily increase.

A second cause of agricultural development in rural areas and communities may involve the development of agriculturally related secondary industries that process food and fiber products. For example, feedlots may be established to utilize locally produced feed grains and feeder livestock, or packing plants and grain milling facilities may be built to process agricultural products that were previously transported elsewhere. Such plants generally have effects similar to those of other manufacturing facilities located in rural areas, providing new jobs and stimulus to the local economy. Depending on such factors as skill requirements and the seasonality of labor demands, these facilities may provide job opportunities for local residents or, on the other hand, may be staffed largely by in-migrants (Lonsdale and Seyler 1979; Summers et al. 1976).

A third cause of agricultural development is changes in the structure of agricultural production. The most pervasive of such changes in recent decades has been the substitution of capital for labor. Recent trends in agricultural mechanization have resulted in fewer and larger farms and a substantial decrease in the farm population. Such trends have been evident since the 1930s and appear likely to continue, at least in some parts of the nation through the year 2000 (Schertz 1979). The changing structure of agriculture has had substantial effects on the economic base of many rural areas. In 1940 there were 20 states in which agricultural employment amounted to 30 percent or more of total employment, but by 1970 only 10 states had as much as 7.5 percent of their work force employed in agriculture. Six of these states (Iowa, Kansas, Minnesota, Nebraska, North Dakota, and South Dakota) are in the North Central region (Jordan and Hady 1979).

The effects of these three forms of agricultural development on economic and social change in rural communities are the subject of the remainder of this paper. First, trends in agriculture in the North Central region are briefly reviewed and the outlook for agricultural development is examined. Then the effects of agricultural development on economic, demographic, and social conditions in rural communities are discussed. Finally, conclusions and implications are presented.

In examining these effects, it is important to stress the reciprocal nature of the effects of the agricultural production sector on nearby communities and the effects of such communities on farmers and their families. Farm operators have become increasingly dependent on the nonfarm economy for employment and for production inputs. The fact that about two-thirds of the total income of farm families now comes from off-farm sources demonstrates the importance of nonfarm jobs (Carlin and Gheiff 1979; Tweeten 1983a). Similarly, agricultural producers have come to rely increasingly on such purchased inputs as fertilizers, pesticides, and machinery and on the services provided by specialized supply firms (Hamm 1979). The interdependence of farm families and rural communities will therefore be emphasized throughout the paper.

Trends in Midwestern Agriculture

In examining the effects of agriculture on midwestern rural communities, we focus on two dimensions. One of these sets of factors relates to farm income and expenses. These factors in large measure determine business activity tied to buying power. The second dimension is farm size and numbers that determine community service needs and social activity tied to population (Tweeten 1983a). The implications of current agricultural trends for these key dimensions are addressed by examining trends in (1) supply and demand for farm output, (2) farm size and numbers, (3) intensification of agricultural production, and (4) decentralization of agricultural processing.

Supply and Demand for Farm Output

Future levels of inputs purchased and products marketed through rural communities will depend on trends in the aggregate supply-demand balance for farm output. During the 1950s, productivity increased supply faster than demand and generated surpluses that persisted well into the 1960s (Tweeten 1983a). During the 1970s, substantial increases in exports caused aggregate demand to grow faster than supply and led to a period of relatively favorable commodity prices and relatively high returns to resources in farming. Over the last few years, the combination of weak export markets and an increased supply capacity, stimulated by the high returns of the 1970s, has led to growing inventories of major crops, sharply lower prices, and low returns to resources. While future trends in aggregate supply and demand are inherently difficult to predict, projections from several sources suggest that supply and demand may grow at nearly equal rates in the late 1980s and 1990s (Tweeten 1983a). The implication of such projections is that no strong upward or downward trend in real farm prices is anticipated. Although short-run fluctuations can be expected, persistent gains in real farm prices that could in turn stimulate economic growth in rural communities seem unlikely to occur.

In fact, the current state of the farm economy has created considerable concern among some farm families, the lending community, agribusiness firms, and public officials at national, state, and local levels. Over the last few years, high interest rates and unfavorable cost-price relationships have led to substantial declines in farmland values across the North Central region (Dorow 1984). The combination of high interest rates and low returns has made debt service difficult for many operators. Falling land values have pushed some farmers' debt-to-asset ratios to dangerously high levels and caused creditors to become concerned about the security of their loans (Paulsen 1984; Pederson et al. 1984). Although the overall financial position of agriculture remains strong, it appears that as many as one-third of the farmers in many North Central states may be experiencing serious cash flow problems and that 10 to 20 percent have such critical financial difficulties that they may not be able to continue farming if current conditions persist for another year or two (Dorow 1984; Paulsen 1984; Pederson et al. 1985).

The potential effects of a large number of farm failures are substantial. In the short run, agricultural supply vendors and lenders are quite vulnerable to financial loss. Vendors are particularly vulnerable as they usually sell feed, fertilizer, and chemicals on short-term credit (e.g., 30 days) without the protection of a security interest in the livestock or crops. Such vendors usually receive

less than five cents on the dollar in liquidations or bankruptcies of customers, and it has been estimated that at least 25 percent of the agricultural supply vendors in Iowa would themselves become insolvent if bad debts reached 5 percent of sales (Paulsen 1984). Similarly, lenders who have extended operating credit to farmers could experience losses, and banks with high proportions of agricultural loans could be particularly vulnerable.

In the longer run, the primary effect of the financial crisis will likely be to accelerate farm consolidation. Current trends in rental rates, which have been stable or even increasing in the face of falling land values, indicate that many established farmers are attempting to gain access to more land in order to spread the high costs of machinery and equipment (Dorow 1984). Further, recent monetary and fiscal policies pose fewer problems for the established commercial producer and for the part-time farmer than for beginning farmers and those who are highly leveraged as a result of recent expansion (Tweeten 1983b).

Farm Size and Numbers

Past trends of declining farm numbers and increasing average farm size are expected to continue through the remainder of the century (Schertz 1979; Tweeten 1983a). Although evidence concerning economies of size in farming is sometimes conflicting (Miller 1979), lower costs per unit achievable by larger farms do appear to provide a significant incentive for farm expansion (Tweeten 1981). Thus, the number of farms with sales in excess of \$100,000 is expected to grow substantially. Significant numbers of smaller farms can be expected to remain, but many will be operated by part-time farmers who often have substantial earnings from off-farm work to supplement their farm income. In many areas, the farm structure is becoming bimodal (or dualistic) with many part-time farmers operating small production units while a few full-time farmers operate large farm businesses (Carlin and Ghelfi 1979). Small- to medium-sized farms with full-time operators are expected to account for a declining share of farm numbers and output. In comparison to large commercial farms and small part-time operations, the medium-scale farm is disadvantaged because of (1) cash flow problems associated with the inflation cycle, (2) higher risk in the face of less sophisticated risk management opportunities compared to large firms, (3) less risk-reducing, off-farm income compared to small farms, and (4) high asset requirements for an economic unit coupled with life-cycle financing arrangements on typical family farms (Tweeten 1983a).

In considering likely trends in farm size and numbers in the North Central region, intraregional variations must be kept in mind. Such variations will probably be most significant with respect to part-time farming. While the percentage of farm operators who work off the farm is substantial and growing in areas where many farmers have access to off-farm employment opportunities, some areas of the western Corn Belt and northern Plains states have very limited off-farm opportunities (see Table 7.1). In these areas, future trends of declining farm numbers may be more pronounced than in the more industrialized and urbanized states of the eastern Corn Belt.

Table 7.1. Farm Operators by Principal Occupation and Number of Days Worked Off the Farm, North Central States, 1974 and 1982

State	Year	Percentage of Farm Operators	
		Whose principal occupation is farming	Who worked off the farm 200 days or more
North Dakota	1982	84.0	13.2
	1974	89.4	8.5
South Dakota	1982	81.5	15.1
	1974	86.0	9.9
Nebraska	1982	78.9	17.9
	1974	83.6	11.6
Kansas	1982	64.5	29.1
	1974	72.8	21.4
Minnesota	1982	71.8	22.6
	1974	78.8	17.4
Iowa	1982	74.6	21.9
	1974	81.0	16.1
Missouri	1982	52.0	36.6
	1974	60.6	29.7
Wisconsin	1982	70.5	24.6
	1974	72.4	23.4
Illinois	1982	64.7	28.3
	1974	71.9	22.8
Indiana	1982	52.1	39.3
	1974	56.9	35.9
Michigan	1982	51.3	39.5
	1974	53.7	38.3
Ohio	1982	49.7	40.7
	1974	54.4	38.3

Source: U.S. Bureau of the Census, 1982 and 1974, Census of Agriculture, Geographic Area Series, Washington, D.C.; U.S. Government Printing Office.

A substantial and rapid decline in farm numbers could lead to severe adjustments for agribusiness and retail firms in agricultural trade centers. Trade and service firms whose business depends largely on the number of families in the local area (e.g., grocery stores) would likely experience substantial reductions in sales. For some agribusiness sectors, total business volume may not be affected greatly by a decline in farm numbers, but individual firms and trade centers may experience substantial losses if the trade patterns of remaining farm operators differ significantly from those of farmers who were unable to survive financially. For instance, some observers believe that large-scale farmers are likely to bypass local elevators and farm supply dealers in order to deliver their grain directly to subterminal facilities and to obtain supplies and machinery from large volume dealers who may be able to offer attractive discounts (Brown 1979). In fact, there is substantial evidence that this phenomenon is already occurring because elevators that are able to load unit trains can offer more attractive prices than their smaller competitors.

In addition, a significant decline in farm numbers may have a substantial effect on the need for public primary and secondary schools in rural areas, although the magnitude of these changes is difficult to estimate without specific information concerning the demographic characteristics of financially troubled farmers.

Intensification of Agricultural Production

Perhaps the most salient trend in American agriculture has been the substitution of capital goods, which incorporate new and improved technologies, for land and labor (Schertz 1979). More intensive application of fertilizer and agricultural chemicals (herbicides and insecticides), coupled with development of new crop varieties, has led to substantial yield increases. Similar increases in production efficiency and total output have occurred in the livestock sector as a result of the improved genetic potential of animals and increased nutritional knowledge.

These trends appear likely to continue. As a result, the agricultural services sector should continue to experience substantial, and perhaps growing, demand. At the same time, the composition of demand for purchased inputs and services is likely to change, and agricultural supply firms and marketing organizations may need to make substantial adjustments in response to such changes. For example, trends toward fewer but larger commercial farms may mean that fewer farm machinery dealerships will be needed but that those that remain will be required to have more extensive capabilities to service increasingly complex equipment. Similarly, the increasing intensity of fertilizer and chemical applications may lead to greater demands for suppliers to provide specialized services (e.g., custom application, plant analysis). Finally, it is important to note that future trends in the intensity of input application will depend in part on trends in real prices of farm products. Relatively high prices create incentives to use higher levels of variable inputs (e.g., fertilizer), while depressed price levels have the opposite effect.

In some parts of the North Central region, additional irrigation development may lead to substantial increases in the intensity of agricultural production. In Nebraska, for example, total irrigated acreage increased from 1.2 million acres in 1954 to 6.0 million acres in 1982 (U.S. Bureau of the Census 1982). In the Ogallala aquifer region of that state alone, 12.3 million acres are estimated to be

suitable for irrigation development, and it is projected that about 5 million additional acres might be developed by the year 2000 (Supalla et al. 1982). Development of this magnitude would clearly stimulate demand for a variety of farm inputs and would lead to additional marketing of farm output.

Trends toward expanded irrigation exist in other parts of the northern Plains and western Corn Belt (see Table 7.2). However, the pace and extent of future development appears likely to be heavily dependent on energy costs, interest rates, water allocation, and overall price-cost relationships. Thus, trends of decreasing energy prices, lower interest rates, and improving price-cost ratios for major crops would stimulate expanded development while opposite trends would discourage it. Another factor that will greatly affect irrigation potential in the northern Plains is the availability of public funds for large-scale, public sector water development (e.g., the Garrison Diversion project in North Dakota), although the present economic and political climate does not appear to favor extensive public funding for such projects. Finally, it should be noted that while irrigation development may partially offset the forces leading to declining farm numbers, it is unlikely to reverse these trends even under conditions favorable to such development.

Decentralization of Agricultural Processing

The agricultural processing sector appears to be experiencing a trend toward decentralization similar to those trends that have been noted in many forms of manufacturing (Lonsdale and Seyler 1979; Summers et al. 1976). Such trends have been particularly noteworthy in the case of meat packing, where the tendency to locate new plants close to major livestock producing areas, rather than in cities with terminal markets, has been pronounced. Improved communications and more flexible transportation systems have helped make rural locations feasible for a variety of agricultural processing facilities. Further, growing recognition that many rural areas can supply ample numbers of productive workers at wage rates significantly below those prevalent in major metropolitan centers has also encouraged rural locations (Tweeten and Brinkman 1976). As a result, various facilities for processing agricultural commodities have been located in rural areas. In North Dakota, for instance, at least 35 new plants with a total capital investment of \$232 million have been built since 1970 (Mittleider et al. 1983).

During the next two decades, situations favorable to the location of additional agricultural processing facilities in rural areas of the North Central region will likely arise. These facilities are generally viewed with great favor by rural development planners, allowing more value to be added to an area's agricultural commodities before they are exported from the region. Such facilities also result in the creation of new jobs and payrolls in the community, which in turn lead to increased business for local retail and service firms. When new facilities are proposed, they must be carefully evaluated, however, to ensure their economic feasibility.

These, then, are the major trends of agricultural development and change that we anticipate in the North Central region over the remainder of the century. The implications of such agricultural trends for socioeconomic change in rural communities are discussed in the sections that follow.

Table 7.2. Land Irrigated and Farms with Irrigation, North Central States, 1954, 1974, and 1982

State	Year	Percent of land in farms that is irrigated	Percent of farms with irrigation
North Dakota	1982	0.4	2.1
	1974	0.2	1.2
	1954	0.1	0.6
South Dakota	1982	0.9	4.9
	1974	0.3	2.5
	1954	0.2	1.5
Nebraska	1982	13.4	36.8
	1974	8.6	30.1
	1954	2.5	12.4
Kansas	1982	5.7	9.9
	1974	4.2	8.5
	1954	0.7	2.3
Minnesota	1982	1.1	2.3
	1974	0.3	0.9
	1954	a	0.2
Wisconsin	1982	1.5	2.1
	1974	0.7	1.3
	1954	0.1	0.4
Iowa	1982	0.3	0.5
	1974	0.1	0.3
	1954	a	0.1
Missouri	1982	1.4	1.8
	1974	0.5	1.1
	1954	0.1	0.4
Illinois	1982	0.6	1.2
	1974	0.2	0.6
	1954	a	0.2
Indiana	1982	0.8	1.6
	1974	0.2	0.7
	1954	0.1	0.3
Michigan	1982	2.6	5.4
	1974	0.9	3.2
	1954	0.1	1.0
Ohio	1982	0.2	1.3
	1974	0.1	1.1
	1954	0.1	0.5

*Less than 0.05 percent.

Source: U.S. Bureau of the Census. 1982 and 1974. Census of Agriculture. Geographic Area Series. Washington, D.C.: U.S. Government Printing Office.

Socioeconomic Effects of Agricultural Development

As is the case with any form of development, agricultural development has both direct and indirect effects. Direct effects include initial changes in farm or processing plant employment and the earnings of workers and proprietors. Indirect effects include changes in local business sales, employment, and income resulting from the initial stimulus of agricultural development, migration to or from the area that results from the changes in employment opportunities, shifts in public service requirements arising from changes in the size and age composition of the local population, and so on. In the following discussion major emphasis will be placed on the indirect effects of agricultural development. Both the direct and indirect effects will be examined in relation to (1) economic effects—including changes in employment, income, and property values; (2) demographic effects—including changes in population size, distribution, and composition; and (3) social effects—including changes in the social structures of rural communities and in the values and attitudes of rural residents. Such a focus is admittedly arbitrary because numerous other factors (e.g., public services, tax structures, etc.) are also affected by agricultural development. However, because these three factors represent major socioeconomic components, their examination should adequately demonstrate the interdependencies between agricultural development and socioeconomic change in rural areas. In each case, the intent is to delineate the areas of actual and potential impacts and to note the state of knowledge concerning such impacts.

Economic Effects

Local economic impacts will be examined with respect to agricultural processing, increases in the intensity of input use, and changes in the structure of agriculture.

Agricultural Processing

A large-scale agricultural processing plant, like other forms of manufacturing, affects all aspects of a rural area's economy, including employment, income, local business activity, wage rates, and property values. The extent of these effects will depend on a number of factors; one of the most important is the magnitude of the plant's labor requirements relative to the size of the local labor pool. If a new plant's labor requirements greatly exceed the number of available local workers, many of the new positions may be filled by in-migrants or long-distance commuters. On the other hand, if the plant's work force needs are relatively modest, a high percentage of the jobs could go to local workers if they possess appropriate skills.

In addition to the employment created directly in the new plant itself, processing facilities can be expected to stimulate increased economic activity and employment in various trade and service sectors of the local economy. This additional employment, created indirectly as a result of the project, is often termed secondary employment; other commonly used terms are service, residential, and indirect and induced employment (Leistritz, et al. 1982).

Direct Employment. Many new agricultural processing plants have rather small labor requirements. For example, of the 35 new facilities developed in North Dakota since 1970, only two employed more than 100 workers (Mittleider et al. 1983). Although it would appear that the labor supplies of many rural

communities would be adequate to meet the needs of most prospective processing plants, little specific information is available concerning who actually obtains the new jobs. Some observers believe rural industrialization generally has not been very effective as a means of reducing unemployment and rural poverty because many jobs go to commuters, in-migrants, and new entrants to the labor force rather than to unemployed, underemployed, and low income workers (Summers 1982). On the other hand, other studies suggest that high rates of local worker recruitment can be achieved even in sparsely populated areas if the new firm's management provides on-the-job training and orientation programs (Halstead et al. 1984).

A case study of workers at four moderate-sized manufacturing plants located in Jamestown, North Dakota, provides some insights concerning characteristics of new plant workers. The four plants employed an average of 100 workers. Jamestown is a trade center with a population (at the time of the study) of about 15,000, located in an agricultural county with a population of about 23,000. About 37 percent of the workers surveyed had relocated to Jamestown when they obtained jobs at the plants. The other 63 percent were recruited from the local area. Of the relocating workers, 69 percent moved from other residences within the state, while 31 percent were from out of state (Helgeson and Zink 1973).

Secondary Employment. Ex post evidence concerning the actual secondary employment effects of agricultural processing facilities is quite limited. Ex ante studies of the potential effects of such plants often project secondary employment to equal or exceed the level of direct plant jobs. For example, an evaluation of 35 facilities in North Dakota led to an estimated employment multiplier of 2.5 (i.e., 1.5 secondary jobs per direct job) at the multicounty regional level (Mittfelder et al. 1983). On the other hand, retrospective case studies of rural manufacturing facilities suggest that secondary employment effects may be much more modest. Based on a review of a number of such studies, Summers (1982) reports that it takes an average of three new manufacturing jobs to generate one additional secondary job in the host community. Reasons cited to explain these low multiplier effects are that (1) much of the plant's payroll is leaked from the host community because workers commute from residences in other towns or because local workers do much of their shopping in regional centers, (2) local businesses have excess capacity and are able to handle a substantial increase in sales without hiring additional help, and (3) some new industries are tied into regional and national networks of suppliers and, hence, purchase little beyond labor locally (Summers 1982).

Certainly the range in estimated multiplier effects points to the need for careful analysis of proposed projects. Also in reviewing estimates of multiplier effects, it is important to discern at what level (e.g., community, county, or multicounty district) these effects are being estimated. Multipliers generally increase as they are measured over a larger geographic area because such flows of funds as earnings of commuters and purchases at regional centers, while representing a leakage from the host community, are included when a larger area is studied (Tweeten and Brinkman 1976).

Income. Development of a major facility can be expected to result in substantial changes in income in the affected area. As in the case of employment, both direct and indirect effects are important, and income multipliers are frequently used to estimate the magnitude of indirect income effects.

The direct income effects of a plant depend primarily on the facility's payroll and the extent to which it purchases supplies and materials locally. The indirect income effects will depend on the factors discussed with respect to employment; generally larger, more diversified economies will have larger income multipliers. For example, Tweeter and Brinkman (1976) report that income multipliers are frequently of a magnitude of 2.0 for multicounty districts, but often in the range of 1.0 to 1.5 for individual communities. That is, a multiplier of 1.0 indicates no additional net effect beyond the direct income increase. Chalmers et al. (1977) report similar finding from a study of counties in the northern Great Plains. For regional trade center counties, which generally had populations in excess of 15,000 and personal income in their market areas in excess of \$100 million (in 1977 dollars), the average income multiplier was 2.02. For second-order counties with populations exceeding 5,000 and market area personal income exceeding \$20 million, the average income multiplier was 1.66. For counties with populations less than 5,000, the average multiplier was 1.23.

Gordon and Mulkey (1978) report results similar to those noted above. Based on a review of community input-output studies, they conclude that income multipliers for small communities are generally in the range of 1.1 to 1.5, while larger communities (or functional economic areas) may have multipliers of 1.5 to 2.5. The authors point out, however, that these multiplier values represent an average for the entire local economy. Larger multiplier values may be associated with growth in certain local sectors.

A major question with respect to the income effects of a project relates to their distribution among the local population. One relevant analysis addressed the effects of industrial development on incomes and income distribution of rural industrial workers in Texas (Reinschmidt and Jones 1977). Data from nine industrial plants in six Texas communities with populations less than 15,000 indicated that 80 percent of all workers increased or maintained their previous earnings when they took jobs at the plants. The analysis also indicated a slight increase in the equality of overall income distribution among these workers. Individuals in the lowest income categories prior to taking jobs with the plant experienced the greatest income gains, partly because 27 percent had previously been unemployed.

Two other analyses also address the income distribution effects of rural industrialization. Deaton and Landes (1978) report that obtaining employment at new plants resulted in increased equality of family income distribution among manufacturing workers in rural Tennessee. Rogers et al. (1978) examined the equality of individual income distribution for all residents of Iowa towns of 2,500 to 10,000. A positive but weak relationship was observed between the percentage of the community's labor force employed in manufacturing and the equality of income distribution. In general, these authors conclude that the relationship between changes in manufacturing activity and changes in income distribution may be inconsequential in smaller towns that do not experience large changes in manufacturing activity.

Local Business Activity. Retail and service firms generally experience increased sales when a new plant is developed because some of the income gains are spent locally (Summers 1982). Recent studies of rural communities experiencing rapid growth resulting from construction of energy conversion plants have indicated substantial increases in both total retail sales and sales per

establishment (Gilmore et al. 1982; Thompson et al. 1978). Some communities, however, have experienced an overexpansion of the local trade and service sector in response to project development, possibly because the local secondary effects had been overestimated (Gilmore et al. 1982). Careful analysis of prospective effects therefore seems advisable.

Wage Rates. When development of a new facility creates a substantial number of job opportunities, local wage rates may be affected. A new plant frequently pays wages higher than those prevailing in rural areas. Local firms and public service providers sometimes fear that they will be forced to raise wage rates substantially to avoid losing their most productive workers or to attract replacements. Two recent analyses of wage rate changes in communities that had experienced substantial growth associated with energy development projects, however, appear to indicate that the effects on wage rates in the local trade and service sector are usually small (Halstead and Leistriz 1984; Thompson et al. 1978). Both studies found that during the years of project development and community growth, wage rates paid by local trade and service firms increased only slightly faster than the national rate of inflation.

Property Values. Rural industrialization often leads to increases in property values through a mixture of additions of new—and improvements of existing—property and appreciation of existing property. In a case study of Parsons, Kansas (population 13,015), Debes (1973) found a substantial impact on property values from 434 new industrial jobs created between 1960 and 1970. New industrial jobs and the resulting stimulus to the local economy were responsible for increasing the value of residential housing by over \$7 million (or 18 percent) in the 10-year period. Most of the increased property values occurred among existing housing.

Increasing Intensity of Input Use

Economic impacts resulting from increasing intensity of agricultural production generally arise through the expanded activity of input supply and marketing firms. The amount of employment in such agribusinesses is difficult to measure. While it does not appear to be a major source of nonfarm rural growth on a national basis (Jordan and Hady 1979), agricultural service employment is clearly very important to the economic vitality of many small towns in agricultural regions.

If the intensity of input use and level of farm output increase as a result of irrigation development or general technological advances, agribusiness firms will experience increased receipts and may hire additional employees. However, if such firms have some excess capacity, the initial employment effects may be quite small. Except in areas experiencing a major increase in irrigated acreage or a substantial change in cropping patterns, then, substantial employment growth in the local agribusiness or agricultural service sector does not appear probable. More likely to occur are substantial shifts in the nature of the inputs and services required and some reorganization of agricultural service delivery systems. Farmers may demand more specialized services (e.g., marketing advice or integrated pest management), and some trade centers may gain at the expense of others as grain marketing and farm supply systems are reorganized.

Changes in Farm Structure

Changes in the structure of farming, recently characterized by trends toward fewer but larger commercial farming operations and by increases in the relative importance of part-time farmers in some areas, clearly will affect levels of economic activity in many agricultural trade centers. Fewer farms will mean a declining population base to support local retail and service establishments, although the remaining producers probably will have higher per capita incomes and purchasing power.

Larger farms use fewer total inputs per unit of output, and so a trend toward larger units will lead to a general reduction in economic activity in rural communities. For example, Tweeten (1983a) estimates that if American agriculture were reorganized into farms with sales of \$200,000 and up, agriculture-related economic activity in rural communities would decline to about 78 percent of 1981 levels. On the other hand, if agriculture were reorganized into farms with gross sales of \$20,000 to \$40,000, economic activity in rural communities would rise 5 percent over 1981 levels. In a similar analysis, Sonka and Heady (1974) found that conversion of agriculture to larger farms would cause the amount of income generated in rural communities to fall about 17 percent compared to a typical farm alternative, while conversion to small farms would lead to an increase of about 14 percent.

Differences in the estimates of economic activity for rural communities resulting from alternative farm sizes might be even greater if adjustments were made for the greater proportion of purchases made in local communities by operators of smaller farms. For example, Marousek (1979) reports that small-farm operators in Idaho had a higher propensity than large-farm operators to purchase both farm inputs and consumption goods locally. Similarly, studies of the towns of Arvin and Dinuba in California by Goldschmidt (1946) and the Small Farm Viability Project (1977) indicated that the community surrounded by small farms (Dinuba) had experienced a higher level of retail trade and a greater growth rate in both retail trade and population than the community surrounded by large farms (Arvin). The small-farm community also had about 2.5 times the number of independent business outlets found in the large-farm community. These findings are challenged, however, by Hayes and Olmstead (1984), who contend that factors in addition to differences in farm size contributed to Arvin's slower community development.

While past trends of declining farm numbers and the rise of manufacturing and other industries have diminished the relative importance of agriculture in many rural areas, a substantial proportion of the rural communities of the North Central region are still heavily dependent on agriculture. This is particularly true in the northern Plains and western Corn Belt states. Here, despite the decline in direct on-farm employment, agriculture still dominates the economic base of many communities.

An analysis of the economy of State Planning Region 6 in North Dakota illustrates the role of agriculture in such areas. Region 6 is a nine-county area in south-central North Dakota; Jamestown is its dominant trade center with a 1980 population of 16,280. In 1960, agriculture accounted for 49.6 percent of the total employment and 75.2 percent of the sales to final demand in the region. Between 1960 and 1982, sales to final demand by agriculture grew 83.6 percent in real terms (i.e., adjusted for inflation). During this same period, real output

per farm worker increased 213 percent, with agricultural employment falling to 27.5 percent of the total regional employment in 1982. Sales to final demand by agriculture in 1982, however, amounted to 77.8 percent of the regional total. Thus, agriculture's share of the export base actually increased.

An input-output model was used to estimate the portion of the area's total employment and business activity attributable to agriculture (Hertsgaard et al. 1984). When the indirect and induced effects of agricultural activity were added to the direct effects, agriculture accounted for 80 percent of the region's total employment, 80 percent of total gross business volume, and 76 percent of total personal income in 1982. It is therefore apparent that this rural community, like many in the North Central region, depends on agriculture as its principal basic industry and that its economic welfare is closely linked to economic conditions in agriculture.

Demographic Implications of Agricultural Structure and Changes Therein

Agricultural development and changes in the structure of farm enterprises historically have had major implications for populations in rural areas of the United States. This section describes the effects of changes in agriculture on three major demographic issues: the size of the population in rural areas, the distribution of the rural population, and the composition of the rural population.

Size of the Rural Population

Changes in farming in the United States have always had major implications for the size of the rural population. At its founding, the nation was largely a nation of farmers. The first United States Census, taken in 1790, showed that 95 percent of the American population was rural. Although the farm population was not enumerated separately in the early censuses, it was apparent that the majority of rural people lived on farms (Beale 1978). In 1820, when census data on employment first became available, three-fourths of all employed rural residents worked in farming (Beale 1980).

Throughout the 19th century, both the number of farms and the size of the farm population increased rapidly as the country expanded westward and new farmland became available. Associated with the development of farmsteads on previously unsettled land was the growth of numerous small rural communities to serve the needs of the farm population (Larson 1981). However, by the early 1900s practically all available farmland was being farmed, and as a consequence both the number of farms and the farm population leveled off. In the early 1900s there were about 6 million farms, with a population of around 30 million people. At that time about one-third of the total population of the country and two-thirds of the rural population lived on farms. Thus, the 19th century can be viewed as a period of growth in the farm sector; new land was being cultivated and farms and farm populations were increasing.

For each year between 1900 and 1940, the number of farms in the United States exceeded 6 million and the total farm population remained above 30 million. Since about 1940, however, the industrialization and mechanization of American agriculture have resulted in dramatic farm structure changes that have had major population implications (Paarlberg 1980; Rodefied et al. 1978). Because technological developments have continually replaced human labor in

the production process, farms have become progressively larger in size and fewer in number. As a result, there has been a gradual decline in the number of farms from 5.4 million in 1950, to 3.7 million in 1959, to 2.7 million in 1969, to less than 2.5 million in 1978, and to about 2.2 million in 1982.

The decline in the number of farms, combined with attractive jobs in metropolitan areas, resulted in a vast out-migration of farm people from rural areas. This movement was one of the largest voluntary migratory movements in human history. The farm population dropped from 30.5 million in 1940, to 15.6 million in 1960, and to 5.6 million in 1982, only 2.4 percent of the nation's population (U.S. Bureau of the Census 1983).

This reduction in farm population also has had important demographic implications for the rural communities that developed to serve the needs of farm families. As the farm population declined, the number and variety of business enterprises in the rural communities also declined (Rogers 1982). This was especially true in the smallest, most isolated, and most agriculturally dependent rural communities (Fugitt 1971). Thus, between 1940 and 1970, the population in many agriculturally-based rural communities declined by more than 50 percent (Beale 1978; 1980; Larson 1981).

Changes in farming and a reduced farm population have had major demographic implications for rural areas. Some research indicates that different types of agricultural production have different population implications. For example, Albrecht et al. (1984) compared irrigated and nonirrigated counties in the Great Plains from 1940 to 1980 and found that counties with irrigation development had more farms and more productive farms (as measured by gross sales per farm) than counties without irrigation development. Also, it was found that the amount of irrigation development was directly related to the magnitude and direction of population change. Farming counties that were able to irrigate retained a much larger share of their population than counties that did not have irrigation development. The increased production resulting from irrigation resulted not only in more farms but also in the growth of allied and secondary businesses.

In sum, during the 20th century major technological breakthroughs in agriculture have resulted in fewer and larger farms, a reduced farm population, and a lower nonfarm population in many agriculturally dependent areas. However, research has also shown that the extent to which the farm population has been reduced is partially dependent on the production practices followed and the productivity of existing farm enterprises.

Agriculture and the Distribution of the Rural Population

Changes in agriculture have influenced not only the size of the population in rural areas but also the manner in which this population is distributed among the various regions of the United States and within regions (e.g., the differences between the patterns and trends in the western North Central and eastern North Central states are substantial).

During the settlement of the United States, the agricultural capability of the land and the nature of the crops that could be produced had a major influence on the number and types of farm enterprises that emerged and also on the size of the rural communities that developed to serve the farmers (Larson 1981). What commodities could be produced and the volume of production were a function of

numerous factors, including the quality of the soil, the climate, the availability of water, and the proximity to urban markets. Thus, areas endowed with advantageous resource mixes generally had more farms, more productive farms, and consequently a larger population. This was especially true if the crops produced required extensive labor inputs.

In addition to variations in agricultural resources, there are also extensive differences in the availability of nonagricultural resources in different parts of the country. For example, an area with available commercial minerals or timber could attract a greater rural nonfarm population than an area strictly dependent on farming. Thus, there have always been major differences in both the density of the rural population and the extent to which it is dependent on farming in different parts of the country.

Throughout this century, the rural population in the United States has remained relatively stable (at just above 50 million people) despite extensive declines in the farm population. In effect, the growth of the rural nonfarm population has equaled the drop in the farm population (Beale 1978).

The fact that the total rural population has remained stable conceals major internal shifts in the distribution of this population. Those rural areas most dependent on farming experienced a declining population between 1940 and 1970, while rural areas dependent on other endeavors had population growth. In fact, they had just enough growth to offset the declines in the farming areas. For example, between 1940 and 1970 rural population declines were the greatest in the southern Coastal Plains Cotton Belt and the Great Plains, which are both major agricultural regions. In contrast, rural areas experiencing growth, including such areas as the Florida Peninsula, the Northeast Coast, and the Pacific Coast, were not dependent on farming (Beale, 1978).

The historic relationship between agricultural development and population change has thus been one that has led to population decline. Recently, however, the historic patterns of rural population change have shifted from decline to growth. During the 1960s rural to urban migration began to slow down, and by the 1970s more people migrated from urban to rural areas than from rural to urban areas. For the first time in the nation's history, more Americans were moving away from metropolitan areas than were moving to them (Beale 1975, 1976; Brown and Wardwell 1980; Fuguitt and Beale 1976; Hawley and Mazie 1981; Zutches and Brown 1978).

Numerous factors are involved in this rural population turnaround. One important factor is the increasingly nonagricultural character of the rural economy (Beale 1980; Hawley and Mazie 1981); many counties have become increasingly less dependent on agriculture over the years and have finally reached the point where changes in farm structure are no longer the principal forces influencing population trends. Support for this claim is found in the fact that those counties most dependent on farming were much less likely than others to experience a population turnaround (Brown and Wardwell 1980). In addition, many suburban areas are experiencing growth in both the number of farms and in population as a result of factors that are not motivated by expansion in large-scale production agriculture. This pattern involves persons who move to rural areas for social and environmental reasons and engage in farming as a recreational activity. These farm enterprises have a limited effect on levels of agricultural production but represent an important new source of population growth involved in agriculture.

Composition of the Rural Population

The changing structure of American agriculture, and the corresponding reductions in the rural population, have also had at least three major implications for the composition of the rural population: the employment, the ages, and the racial distribution of rural people.

Rural Employment. At one time in this country, agriculture was not only the principal occupation of most rural residents but also the occupation that employed the majority of Americans. As late as 1930, the proportion of employed rural residents working in farming was still above one-half (Beale 1980). Since 1940, however, there has been a rapid decline in the number of persons employed in farming, while there has been an increase in the number of rural residents employed in mining, transportation, and manufacturing industries.

Today only a small, diminishing proportion of rural residents is employed in agriculture. According to the 1980 Census, only 8.3 percent of employed rural residents work solely or primarily in farming. Manufacturing has become a much more important employer of rural residents, with nearly 26 percent of the employed rural residents working in manufacturing industries in 1980.

National averages do mask some regional differences. About 28 percent of the nonmetropolitan counties in the United States have 20 percent or more of their labor force employed in farming. For the most part these counties are in the Great Plains, the Corn Belt, and the Mississippi Delta—all major agricultural regions. Very few of the nonmetropolitan counties in other parts of the country have a large share of their labor force employed in agriculture.

Age. Changes in the structure of agriculture during the past half century have had important implications for the age structure of the rural population. Historically the loss of farms resulted in a declining population, since the opportunities in farming were minimal and there were few other occupational choices to keep young adults in these areas. As a result, the average age increased as rural populations declined (Rogers 1982; Zuches and Brown 1978). Thus, rural areas are typically characterized as having a larger proportion of elderly residents than do urban areas.

Racial Distribution. The changing structure of agriculture has also had major implications for the distribution of racial groups in the United States. Prior to this century most minority groups, especially Blacks, lived in rural areas of the country. As a vestige of slavery, most Blacks were employed in farming in the southern states. In 1920, for example, 75 percent of the southern Black population lived in rural areas, and 57 percent of them lived on farms (Durant and Knowlton 1978). In the 1930s, Kolb and Brunner (1935) reported that 35 percent of the farms in the South were operated by a Black farmer. Many of these farmers were small sharecroppers on cotton farms.

But as technological changes greatly reduced the need for labor in the Cotton Belt, many Black sharecroppers were pushed off the land. Millions left farming and many migrated to northern industrial cities. By 1960 more than 72 percent of the Black population lived in urban areas, and by 1980 more than 80 percent were urban. In fact, Blacks have gone from one of the most rural racial groups to among the most urban. In 1980, only 13 percent of the employed Black population resided in rural areas, and less than 1 percent was employed primarily in agriculture.

Social Implications of Agricultural Structure and Change

In addition to its other impacts, it is also apparent that the structure of American agriculture and changes therein have major implications for the process of social interaction and for the values, attitudes, and beliefs of rural residents. In fact, the social consequences of changes in the agricultural structure are some of the most widely discussed of all impacts.

At the heart of discussions on the social impacts of agricultural development is the concern that the family farm as traditionally defined is rapidly being replaced by other types of farm enterprises and that the loss of the family farm will have dire social consequences for rural areas (Heffernan 1982; Paarlberg 1980). However, the research to support these claims is not conclusive.

This section reviews the research that examines the relationship between agriculture and social conditions. The discussion will look at the history and the perceived advantages of the family farm and examine some of the major agricultural changes that represent deviations from the ideal family farm and the social consequences of these nonfamily farm types.

The Family Farm in American Agriculture

Historically, the United States has espoused a system of agriculture based on the family farm, and although there have always been exceptions, the family farm has been the dominant mode of agricultural production. Despite a lack of agreement about the attributes of a family farm, most researchers agree that the "ideal" family farm is an owner-operated, medium-sized enterprise wherein family members provide the majority of labor and make the important management decisions (Heffernan 1982).

Policymakers and others have argued that such a farm system has numerous advantages to society. First, the family farmer is considered to be a trustworthy provider of food and fiber (Griswold 1948; Kolb and Brunner 1935; Penn 1979). In addition, the family farm has been associated with values esteemed in American society, such as independence and self-reliance (Paarlberg 1980). Further, the family farm has been viewed as an efficient user and protector of the environment and its natural resources (Buttel and Larson 1979) and as a major contributor to the quality of life in rural communities (Heffernan 1982).

The virtues of the family farm have become so universally and unquestioningly accepted that the achievement of a family farm system of agriculture has become an end in itself, rather than a means to achieve certain ends (Buttel 1983). More definitive research needs to be conducted on the effects of family and nonfamily farm structures, and if it is found that the structure of agriculture bears no relationship to the quality of life, then policymakers need not be concerned. However, if in fact changes in the structure of agriculture do reduce the quality of life, then policies that enhance the viability of the family farm should be promoted (Heffernan 1982).

Numerous deviations from the family farm that could affect social conditions in rural areas are occurring. Three of these deviation—(1) corporate farming, (2) large-scale farming, and (3) part-time farming—will be discussed and research on their implications will be explored.

Corporate Farming

One of the most discussed issues in agriculture in recent years is the growth of corporate farming enterprises. During the decade of the 1970s, there was a 138 percent increase in the number of corporate farms. At the same time, there was a 9 percent decline in the number of family farms. In 1978, corporate farms operated 12 percent of the farmland and had 21 percent of the gross farm sales (Albrecht and Ladewig 1982). The corporate influence is more evident in some commodities than others, however. Commodities especially dominated by corporate farms include fattened cattle, nursery and greenhouse products, vegetables, sweet corn, melons, fruits, nuts, and berries (Albrecht and Ladewig 1982).

There are several reasons many analysts are concerned about the rise of the corporate farm. The public concept of corporate farms is that they are large factories in the field and that they are owned and operated by people outside of farming (Barnes and Casalina 1972; Hightower 1971; Paarlberg 1980). The corporate farm is typically operated by a hired manager who, it is argued, will not care for resources as if he owned the farm. Also it is assumed that a corporate farm would not develop the same qualities of independence and self-reliance as a family farm.

Current research shows more conclusively that the extensive concern with corporate farming may be unfounded (Albrecht et al. 1984). First, most corporate farms (88.6 percent in 1978) are family held. These farms are similar to large family farms except in terms of their legal status (Reimund 1979). Many families have had their family business incorporated for tax or inheritance advantages. In most cases, family-held corporate farms rely on the capital, labor, and managerial decisions of the family in a manner similar to the typical large family farm. The increasing number of these farms does not appear to be a threat to the traditional family-farm system of agriculture (Paarlberg 1980; Reimund 1979).

Second, nonfamily corporate farms are of major importance in the production of only certain commodities. Typically, corporate involvement is greatest in those areas of agriculture that are characterized as being capital intensive and as experiencing rapid technological change (Seckler 1969). In fact, the efforts of many corporations to enter land-intensive agriculture have failed (Cordtz 1972). Farmers have traditionally bid against one another and have pushed the price of land up so high that it provides a low return on an investment. This is done because a farmer views the land not just as an income-earning enterprise but also as a place to live and an assured way of continuing to do the kind of work preferred (Paarlberg 1980). Further, the family farmer also has incentive beyond that of a hired manager (Murray 1970). As Paarlberg has stated:

[The family farmer] is self-employed and self-supervised. He works long hours. . . . He will stay up all night, if need be, at lambing time. . . . If times are hard the family farmer takes in his belt, pays himself a lower wage, and is there ready to go when things improve. Compare this with the handicaps of corporate farming: unionized wages, harvest time strikes, limited working hours, prescribed working conditions, unmotivated labor, and the need for detailed supervision (1980, p. 194).

Therefore, it does not appear that the corporate farm will become a major factor in American agriculture. As such, the consequences of the corporate farm for the quality of rural life should be minimal. The exception, of course, will be in those areas of the country that are heavily dependent on commodities dominated by corporate production.

Large-Scale Farming

Agricultural production in America is becoming increasingly dominated by a few very large farms. In the early 1980s, it was found that the approximately 17,000 farms with gross annual sales of over \$500,000 (less than 1 percent of all American farms) were producing about 27 percent of the farm commodities (Knutson et al. 1983). Further, the largest 6 percent of the farms were producing over one-half of the farm commodities measured in gross sales in 1978 (Paarlberg 1980).

Large-scale farms differ from the traditional family farm in that they are dependent upon a hired labor force, which is typically a socially disadvantaged group. It is argued by some that if agricultural holdings and production are concentrated into the hands of a few, then income, educational opportunities, the level of living, and other advantages will also be tilted in favor of these few. For example, T. Lynn Smith states that

. . . closely associated with a high degree of concentration . . . are such phenomena as the following: (1) a sharp division of the rural population into a small, highly developed group of the elite at the apex of the socioeconomic scale and a huge mass of persons who are only slightly above the creature or brute level of existence at the base; (2) practically no shifting up or down in the scale, or from one class to another; (3) a strong cast element in that the status of human beings is determined largely by that of their parents; (4) widespread poverty and low average levels of living among those engaged in agricultural pursuits; (5) a rural or agricultural population in which the average level of intelligence is low and in which the differences between the extremes are very great, i.e., a condition in which only a small fraction of the human potential is realized. . . . (1972, p.8).

There is a large and rapidly growing literature on the social consequences of large-scale farming. Much of this literature can be traced to the classic research of Walter Goldschmidt. During the 1940s Goldschmidt (1946) showed that a community surrounded by small owner-operated farms had a much higher level of individual and collective well-being than a community surrounded by large-scale farms. Since then, an extensive body of literature has emerged that examines the impacts of large-scale farming on a community and the rural social structure (e.g., Harris and Gilbert 1982; Heffernan 1982; Heffernan and Lasley 1978; Goldschmidt 1978a, 1978b; Small Farm Viability Project 1977; Sonka and Heady 1974). Some of this research has concurred with the general findings of Goldschmidt that large-scale farming is detrimental to the rural social structure, while some of it has not. Harris and Gilbert (1982), for example, found that the prevalence of large farms was positively related to the incomes of both farmers and farm workers.

Many researchers have suggested that trends toward large-scale farming would have negative implications for the quality of rural life. Again, although some research efforts have found support for this view, others have not. Before definitive statements are made, additional research should be conducted to show the implications of large-scale farming for different aspects of rural life.

Part-time Farming

One of the most striking of the recent changes in the structure of American agriculture is the rapid increase in the importance of part-time farming (Albrecht and Murdock 1984; Cavazzani 1979; Larson 1981; Singh 1983; Wimberly 1983). The 1940 Census of Agriculture estimated that about 15 percent of all farm operators had 100 or more days of off-farm employment per year; this proportion had risen to 44 percent by 1978. Not only is there a larger proportion of the farm population who have off-farm work, but those who work off the farm do so for longer periods of time. In addition, female members of farm families are becoming increasingly important in the nonfarm labor force (Coughenour and Swanson 1983; Maret and Copp 1982). It is now estimated that 92 percent of the farm families in the United States have some type of nonfarm income (Carlin and Ghelfi 1979). Off-farm employment has increased in importance until, in 1977, only 39 percent of the income of farm persons came from the marketing of crops and livestock (Paarlberg 1980).

Since part-time farms represent a major departure from the traditional full-time, medium-sized family farm, a great deal of research has examined the potential consequences of increased levels of part-time farming. For example, historic sociological analyses of part-time farming have suggested that high levels of off-farm employment would contribute to the instability of the rural social structure (Loomis and Beegle 1950; Nelson 1948). More recently, research has examined the consequences of part-time farming for rural communities (Coughenour and Christenson 1980; Heffernan et al. 1981), for agricultural production efficiency (Ladewig and Garibay 1983; Singh and Williamson 1981), and for political institutions (Buttel and Larson 1982). Still other analyses have examined farmers' level of commitment to off-farm work and the role of part-time farming in farmers' career patterns (Bertrand 1967; Fuguitt 1961; Larson 1981; Wardle and Boisvert 1974), as well as the values and attitudes of part-time, compared to full-time, farmers (Coughenour and Christenson 1980; Donohue 1957a, 1957b). In addition, the role of part-time farming in the emerging pattern of "agricultural dualism" has been examined (Coughenour and Swanson 1983; Stockdale 1982). Finally, research also has examined the role that part-time farming plays in farmers' migration patterns (Fuguitt 1959; Fuguitt et al. 1977; Fuller and Mage 1976; Kada 1980).

This research reveals that part-time farms may not be as productive as other farms, but that a movement toward part-time farming will have few social consequences (Heffernan et al. 1981). In fact, for many farmers becoming a part-time farmer may be an alternative to migration and may therefore strengthen the rural social structure.

Changes in agricultural development do have consequences for the nature of social processes in rural areas. Historical patterns of declining farm number have led to an aging population base and to a declining sense of community viability (Heffernan 1982). The rise of part-time farming has led to an integration

of farm and nonfarm lifestyles and further reduced the isolation of rural areas. The development of recreational farms has led to a new form of farm residents. In conclusion, the social consequences of agricultural development have been, and promise to continue to be, of substantial importance for understanding the future of rural areas.

Conclusions and Implications

Agricultural development can have profound social and economic effects on rural communities. Agricultural development can be caused by the increased intensity with which variable inputs are applied to a unit of fixed input (e.g., land), by the development of agriculturally related secondary industries that process food and fiber products, or through structural changes, such as the substitution of capital for labor. Each of these main causes of agricultural development results in unique changes in the socioeconomic fabric of rural communities.

The current financial crisis in agriculture will likely result in a substantial change in the social and economic structure of rural America. Although all forms of agricultural development discussed in this paper influence rural communities, none is likely to have as profound an effect as the probable outcome of America's current farm crisis. If as many as 20 percent of the country's commercial farmers fail financially, their land will probably be operated as larger-sized farms. A wave of farm failures will not cause a decrease in aggregate farm output but will result in a substantial decline in the number of farms and farm families. Most of the farms that fail will be medium-sized, full-time, family-type operations.

Such a depopulation of American farms would have serious implications for the affected farm families, for agribusiness firms, and for the rural area's entire trade and service sector. Public services, such as schools and other infrastructure, would be negatively impacted. Farm operators and others who lose their jobs would be required to seek alternative employment. Because jobs are scarce in many rural areas, many families would have to leave the local area. The social cost of this exodus could be very great.

The farm and agribusiness sectors have paid a high price in America's war against inflation. Agricultural policymakers should keep the social and economic consequences of a large percentage of farm failures in mind as they look toward creation of a new farm bill. Policy options could range from a "Chrysler-type" bailout for agriculture to such methods of easing the pain for farmers who fail financially as grants or low interest loans for retraining or education.

More research is needed on the individual characteristics of the farm and agribusiness families that are likely to fail. Research comparing the social costs to society resulting from a rash of farm failures versus the economic costs associated with sustaining these farm families should be conducted immediately.

It is apparent that the theoretical and empirical relationships between agricultural development and socioeconomic change in rural areas have not been adequately established. It is unclear, for example, despite decades of analysis of the decline in the number of farms and in rural population, what the exact levels of population decline would be from a given decline in farm numbers; what the interrelationships are between such factors in different regions of the nation; what the multiplier effects are likely to be; and so on. In this area of study, we

have only a very general idea of the direction and magnitude of the relationships between key factors. Clearly then, the empirical relationships between agricultural development and socioeconomic change in rural areas must be more fully analyzed.

Equally problematic is the fact that socioeconomic theories of change do not adequately explain patterns involving declining magnitudes—the very patterns that have been dominant in rural, agriculturally dependent areas. Our theories of socioeconomic expansion are more complete than our theories of socioeconomic contraction and decline. In like manner we are ill-prepared to explain transformations in agriculture and rural communities that involve marked discontinuities with past trends. For example, the emergence of farms operated by part-time farmers who are primarily urban residents was not anticipated by most existing theories of socioeconomic change. It seems likely then that better developed theories of socioeconomic change will be necessary to explain the complex interrelationships between the coterminous patterns of economic expansion and demographic and social contraction that have predominated in many rural areas in the North Central region in recent decades.

It is necessary to conclude that we are also ill-prepared to understand the evolving relationships between agricultural development and socioeconomic change that are likely to occur in rural areas in the coming decades. If our analyses of the changes during these decades are to consist of anything other than retrospective historical descriptions, it is critical that the analysts of the interrelationships between agricultural development and socioeconomic change become better informed both empirically and theoretically. Ensuring that we are better informed presents a substantial challenge for researchers in the coming years.

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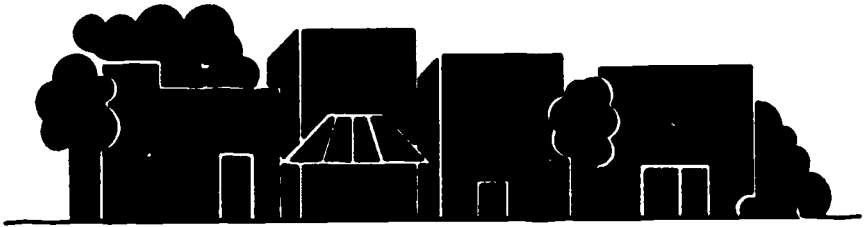
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Session III: Impacts of Community Development on Agriculture

Chapter 8

Infrastructure and Agriculture: Interdependencies with a Focus on Local Roads in the North Central States

David L. Chicoine

The condition of the nation's infrastructure has received a great deal of attention recently in the popular press as well as in policy debates at the state and national levels. Broken water mains, collapsed bridges, and sewage system failures have often filled the front pages of newspapers. The national report, *America in Ruins*, drew the public's attention to the condition of public works at the national level (Choate and Water 1981). A reason often cited for the deteriorated condition of the nation's public capital assets is the years of disinvestment through neglect, deferred maintenance, and delayed repairs. Analysts, however, do not agree on the economic role of infrastructure and how important public assets are to economic growth and viability (ACIR 1984).

Estimates of the cost of rehabilitating the nation's infrastructure vary widely. The variety of approaches and reported amounts reflects the lack of aggregate data on facility conditions, consistency in defining what infrastructure includes, and agreement on service standards. Whether the widespread opinion that the public infrastructure is in need of major overhaul and is a "crisis" either because facilities are inadequate to meet current needs or because they have been undermaintained and allowed to deteriorate is arguable. However, that large amounts of money could be spent to bring public capital facilities up to "acceptable engineering standards," or to citizens' expectations, certainly appears to be the case.

Most of the concern for public works has focused on urban areas. However, efforts underway in the USDA are looking at rural areas and the level and condition of public facilities serving these communities. While the national concern with infrastructure focuses on how to evaluate performance and finance deteriorating facilities, the more immediate problem facing many rural communities may involve building facilities that never existed (Reid and Sullivan 1984).

Infrastructure, as a broad concept, is the basic network of capital facilities that forms the foundation for an economy. Included would be the transportation system, energy and communication utilities, water and sewer systems, and the capital facilities used in the production of public safety and criminal justice, education, solid waste, irrigation, etc. The much publicized national concern is, however, confined to that part of the capital stock that is public in nature and in particular the capital stock in streets and highways, bridges, airports, and water and sewer facilities. There has been little concern over the condition of the natural gas distribution system or the telephone network; the problem in electric power service is more likely to be one of excess capacity and how to finance this capacity than one of overtaxed, aging facilities.

The purpose of this paper is to discuss the relationship between agriculture and infrastructure. To do this effectively, only the infrastructure facilities provided through the public sector are included. In particular, the local rural road and bridge system is analyzed. This approach is taken, first, because the most challenging infrastructure issues involve public choices and policies and, second, because the public facility most extensively related to agriculture in the country, in general, and the North Central region, in particular, is the local rural road network.

The approach is not to present an exhaustive description of all the linkages between agriculture and the road infrastructure that may be important. Rather, the purpose is to present a systematic approach to the relationship between agriculture and the rural road infrastructure that increases the understanding of issues, decisions, and decision makers.

The paper is organized into six sections beginning with a brief conceptual discussion. A review of national infrastructure concerns is presented next, including a discussion of local rural road and bridge issues. The third section provides a historical setting and the institutional arrangements for meeting rural road service demands. The next two parts of the paper overview evidence on (1) demand for local rural road services, (2) the current status of the road system, and (3) road expenditures and financing in the North Central states. The final section includes a summary and policy implications for Midwest agriculture.

Public Infrastructure: The Nature of Services

Facilities that comprise the public infrastructure have no intrinsic value. Their value is derived from the demand for services they help produce. In combination with labor and other inputs, the capital implicit in the facility helps meet service demands. Services are arguments in the utility function of consumers or the production function of firms. An examination of the basic characteristics of services typically provided by the public using capital assets reveals special attributes that require some sort of collective action. Because of these unique qualities, the market place is unable to supply the services. The attributes of exclusion and joint or nonrival consumption require collective provisions through government action. The political process is substituted for the market mechanism and coercive payment systems, commonly in the form of taxes, for prices. By their nature, collective goods and services are used simultaneously by many people and no one can be excluded, for a reasonable cost, from enjoying them. Implicit is the economic incentive for individuals to make full use of such goods without a fair share effort to finance them or to "ride free."

Goods and services can be classified according to the degree to which they possess the properties of excludability and joint consumption. Savas (1982) identifies four idealized types of goods depending on the possession of the attributes: (1) "private goods" (exclusion and individual consumption); (2) "toll goods" (exclusion and joint consumption); (3) "common-pool goods" (nonexclusion and individual consumption); and (4) "collective goods" (nonexclusion and joint consumption). Of course, private and toll goods can be supplied by the market. Sometimes, because of economics of scale, private goods are provided by the public sector but managed as self-supporting enterprises. The rural water supply is an example. Toll goods include communication services and electric

utilities. Roads and streets are collective goods, for it is difficult to exclude persons from using them, and below congestion levels they are nonrival in consumption.

A complicating attribute of organizing for the provision of collective goods and services is the difficulty of measurement (Ostrom 1977). Road mileage can be measured, or traffic and potholes counted, but these observations barely begin to capture the importance of local road systems to the economy of an area or to the well-being of a sector such as agriculture. In this context, democratic government and, for most services involving public facilities, local government, is responsible for sorting out conflicting perceptions and preferences and providing services in the mode, mix, level, and distribution collectively chosen in the policy process (McDowell 1980). The nature of collective goods offers little individual choice to consumers in consumption. Generally the quantity and quality of goods and services collectively provided must be accepted. Because it is impossible to charge directly for the use of collective goods, payment under tax systems is unrelated to individual demand or consumption. Much of the policy debate on setting public service levels, then, is over the form of the revenue system that will raise the necessary public funds.

It follows that the relationship between infrastructure and agriculture can be segmented into three main aspects. These are general enough to be appropriate for all public facilities including the local rural road system, which is the main focus here (Hitzhusin and Napier 1978). First is the collective choice process that determines the level of local road service. Implicit is the demand for transportation services from farm producers and rural landowners. As an input into production, transportation services produced by the local road system lower the cost of moving inputs to the farm and moving products to market. The lower costs increase the income from farming which, because it is the claimant of residual income, causes land values to be enhanced. The demand for public capital embedded in the local rural road infrastructure is a derived demand and would be expected to shift out or expand with higher agricultural prices and incomes. Evaluations of the adequacy of the local road system to meet current and future needs should recognize service demands as well as engineering standards.

The second interrelation is the determination and operation of the public finance system employed to raise the revenues to meet the service demands. The tradition of local road finance has been to incorporate user-based taxes and general taxation in a pay-as-you-go system. Such systems have varied over time and across states. Because of the collective nature of local road services, the economic incentive for the individual producer is to express high service demands and support a finance system with a broad base and large numbers of taxpayers, thereby capturing the most favorable service benefit-tax price ratio. Variation in local road finance systems among the North Central states suggests agriculture has been more successful in this respect in some states than others. It should not be surprising that the collective choice process is dynamic and evolutionary. With majority-rule public decision making, a minority, whose preferences and tastes differ from the majority, is ever present. In general, the more heterogeneous the service preferences, the lower the degree of consensus and the greater the dissatisfaction with service levels and tax systems (Walzer and Chicoine 1985).

A third aspect that is closely related to the first two is the institutional structure of the governance system within which policies are established and services provided. The issue here is the optimal form of service production, provision, and delivery. While the role of the federal government in public capital assets increased in the 1960s and 1970s, state government and particularly local government are dominant in providing the public infrastructure. A characteristic of the governance structure responsible for local rural roads and bridges is that it involves three levels of government, although variations exist among the North Central states in terms of centralization of decision authority and finance. Understanding institutional variation is important in delineating the relationship between agriculture and the public infrastructure used to meet service demands for local rural roads. Institutional variation provides the opportunity to empirically evaluate the performance of alternate governance organizations in the provision of services. While some literature suggests that local governance structure has an impact on the budget behavior and performance of local governments in providing and financing public services, additional study of such selected functions as local rural roads and bridges is needed (Walzer and Chicoine 1985).

Infrastructure: Crisis or Not?

The convergence of four trends has been identified as underlying the heightened concern about the size, quality, and economic significance of the nation's investment in public physical infrastructure. These trends are: (1) the tax revolt leading to austerity at all levels of government; (2) the natural aging of many facilities built during the past decades now requiring rehabilitation, repair, or replacement; (3) population movement and demographic changes, causing reduced demand for certain facilities such as schools; (4) major changes in the private market for tax-exempt capital (ACIR 1984). Large federal budget deficits and state/local tax and spending limits symbolize the pressures on real spending for most domestic programs. The design life of many public facilities has been met. Much of the interstate highway system's 20-year life, for example, has passed, requiring major work to maintain service levels; many of the rural bridges in use today were constructed in the early 1900s.

The consequence of these trends in public assets has resulted in four problems: (1) inadequate new construction; (2) deferred or otherwise inadequate maintenance of existing capital stock; (3) inadequate physical infrastructure to serve economic needs; and (4) financing problems (ACIR 1984).

Reviews of government spending patterns at the national level have been used as evidence in evaluating the underinvestment in maintenance, rehabilitation, and replacement of public facilities. Declines of 30 percent in real investment by federal, state, and local governments between 1965 and 1980 have been reported as proof to support the "infrastructure problem." State and local governments account for a large portion of the decline, with real capital investment by these units declining 37 percent. Some of the national decline can be attributed to the near completion of major public works, particularly the interstate highway system. New investment in school buildings has also dropped as the school-aged population declined (GFRC 1983). No national aggregate analysis, however, can provide information on the condition of the physical infrastructure in any area or state. This shortcoming/deficiency has resulted in

state investigations of the conditions of the infrastructure within their borders (Fisher 1984; Washington State 1983; ICIC 1983).

The disinvestment in public capital because of deferred maintenance is difficult to document because there are no aggregate data on operation and maintenance outlays. Most observers, however, agree with the conclusions of a Congressional Budget Office study that ". . . the most pervasive problem affecting the nation's infrastructure is physical deterioration resulting in mounting needs for repair. . . ." (CBO 1983). Other studies have shown the problems of urban bridges and sewage and water systems to be concentrated in the cities of the Northeast and Midwest (Peterson et al. 1984). The only study of public facilities in rural areas suggests that the issue in these communities is the availability of an adequate supply of facilities rather than the deterioration of existing public investments (Reid and Sullivan 1984).

Because the problems of the public physical infrastructure are both specific and localized, the solutions cannot be national in scope nor apply to all public facilities. The concerns of agriculture in the Midwest regarding local road conditions contrast with the problems of leaky water pipes in northeastern central cities. What links these issues is the need to fully understand circumstances as a prerequisite to the consideration of policies that address the problem.

Local Road and Bridge Conditions

Precise data on the current condition of the over two million miles of local rural roads are not available. The local rural road system comprises those roads and bridges not counted in the federal highway aid system. This system, which is the responsibility of county and township governments, represents 71 percent of the total rural mileage in the country but carries only about 13 percent of all rural traffic. In the North Central states the local rural road system has some 950,000 miles in the jurisdiction of counties and townships. Slightly more than 40 percent of the system is cared for by township government with the remainder under county jurisdiction. There is, however, substantial variation in local rural road responsibilities among the states in the region (FHWA 1983). Most local rural roads were built in the late 1800s and early 1900s, with 70 percent of the bridges constructed before 1935 and designed for a 50-year life (Cooper and Kane 1981).

A 1972 National Highway Needs Report is the most comprehensive analysis of rural road conditions available. The report identified about 50 percent of the total mileage in the local rural road system as inadequate by reason of surface type, narrow lanes, or lack of shoulders. About 75 percent of the rural collector routes were judged to have fair or poor pavement conditions (Cooper and Kane 1981). While data on current road conditions from the national level are not available, some information on conditions in selected states in the region is. As of 1982, for example, 39 percent of the county secondary roads in Iowa were classified as inadequate (IDOT 1983). About 20 percent of the rural township road mileage in Illinois, Ohio, Minnesota, and Wisconsin was classed as needing major repair, with another 30 percent identified as requiring more than normal maintenance (Chicoine and Walzer 1985). There is additional anecdotal evidence suggesting deterioration of the rural road system with the implication that changing traffic demands have exceeded the design capacity of a system based on conditions in the 1940s and early 1950s at best (Baumel and Schornhorst 1983).

Although there is a strong suggestion that local road deficiencies are significant, the condition of local bridges is even less adequate. The number of structurally deficient and functionally obsolete local rural bridges was 151,000 in 1981. This represents close to 60 percent of all local rural bridges. The number of deficient bridges has increased as additional bridges have been inspected and states have increased their maximum weight limits to 80,000 pounds. The majority of states in the North Central region had between 60 and 70 percent of their bridges reported in the deficient and obsolete category. The cost estimates to replace or rehabilitate all deficient rural bridges exceed \$20 billion. This is probably a conservative estimate, however, because bridges less than 20 feet in length are not inventoried and there are thousands of these structures in the local rural road system (Baumel and Schornhorst 1983).

In contrast to other infrastructure facilities, spending on local rural roads has been dominated by maintenance outlays. These expenditures traditionally account for well over 50 percent of local government rural road spending. Inflationary pressures and inelastic revenues have fostered "as-needed" maintenance programs that provide temporary relief but no lasting benefit. Maintenance of roads serving traffic loads that exceed their design standard requires ever-increasing outlays that leave less of local road budgets for reconstruction. There is some evidence supporting these circumstances. In the 1970s capital investment, nationally, on local rural roads declined by one-fourth in real terms, while the real outlays for maintenance increased about 3 percent during this period (Cooper and Kane 1981).

Estimates have been made of funding needs to rehabilitate the rural road systems in individual states. For example, over the next 20 years Indiana county highway financial resources are predicted to fall short of minimum needs to maintain current services by \$250 million (Sinha, Pickett, and Hittle 1981). A similar estimate for Iowa is \$180 million (Baumel and Schornhorst 1983). In the four township states of Illinois, Minnesota, Ohio, and Wisconsin, an average estimate of \$7,946 per mile is needed to upgrade township roads to acceptable conditions. With 217,938 miles of township roads in these states, the total road cost estimate is \$1.73 billion. An additional \$810 million was estimated to be the cost of upgrading township bridges in the four states to acceptable condition (Chicoine and Walzer 1985).

The direct impact of the deteriorating local rural road system on the farm sector is to increase transportation costs. Marketing decisions may also be affected if year-round access to markets is inhibited by the condition of the local road network. Little evidence that quantifies the value of different levels of rural road services to a farm is available. TRIP estimates the additional vehicle operating costs on a per driver basis resulting from poor highway conditions to be \$185 annually (1984). However, their focus is on the major highway systems in the country. A more useful indication of the increased costs associated with poor road conditions is the additional per mile vehicle costs reported by Luhr and McMullough (1983). They estimate the additional vehicle cost per mile for a car or pickup on a low quality aggregate surfaced road to be \$0.072 compared to a similar well-maintained road. Vehicle costs for other types of vehicles are \$0.268 for three-axle trucks, and \$0.433 for a semi-tractor and trailer. For a low grade bituminous surface the vehicle costs are \$0.108, \$0.441, and \$0.732 for the three respective vehicle types. The additional vehicle costs associated with deteriorated road conditions can be contrasted with the variable cost per bushel

mile of \$0.0010 (30.55 per mile loaded) for a three-axle 425 bushel grain truck (Linsenmeyer 1982). This suggests that under poor rural road conditions the variable cost of moving grain to market could be 50 percent more than the cost with higher levels of road service. Of course, the total additional costs incurred would depend on the total miles traveled on poor quality roads.

Institutional Arrangements

A characteristic of the local rural road system in the Midwest is the rectangular road grid that evolved from the land survey set out in the Ordinance of 1785. The customary right of way for these roads is 66 feet with 33 feet contributed from each side of the section line. Initially these roads were maintained by statute labor. Efforts at the turn of the century to bring about some improvements in the condition of rural roads centered on "good road groups," which were coalitions of bicyclists and farmers. The initial focus was to obtain state aid for local jurisdictions with road responsibilities. New Jersey, in 1891, was the first state to provide aid to counties for road support. The New Jersey state aid legislation established the principle that road improvement for the general good was an obligation of the state as well as the local road authority and local landowners. The state aid principle spread slowly to other states. At the national level the Office of Road Inquiry (ORI) was established in the U.S. Department of Agriculture in response to the "good roads" movement. Among the ORI's responsibilities was the development and dissemination of information. Demonstration road improvement projects—"objective lesson roads"—were developed on or near state agricultural experiment station farms to instruct local road officials and to educate the public on the techniques and benefits of "getting the farmer out of the mud" (Armstrong 1976).

Other programs of the Office of Public Roads, which descended from the ORI, included programs to raise maintenance standards on local roads and to improve road management. The federal government's road and highway agency remained in USDA until 1939 when it was moved to the Federal Works Administration. (The U.S. Department of Transportation was not established until 1966.) The Federal-Aid Road Act in 1916 established the concept of a cooperative federal-state program. In 1921 amendments prescribed that federal aid funds be used only on a system of main connecting interstate and intercounty rural roads. These principles remain essentially intact today (Armstrong 1976).

The relationship among federal, state, and local government responsibilities for rural roads in the North Central region is evident in the distribution of rural road mileage across levels of government (Table 8.1). The state is responsible for over 20 percent of the rural roads in Ohio and Missouri and about 8 percent in Iowa, Kansas, Michigan, and North Dakota. Of most interest are the differences in the responsibilities of township governments. On one hand, North Dakota, Illinois, Wisconsin, and South Dakota are reported to rely on township government to maintain the majority of the rural roads. At the other extreme are Iowa, Michigan, and Indiana with virtually no road responsibilities at the township level. In 1884 Iowa adopted legislation authorizing the consolidation of road functions at the county level and the levying of a property tax to finance a county road fund. There are no township governments in Iowa, and local rural roads are the responsibility of Iowa counties.

In the major township states, county responsibility for local rural road mileage ranges from about 10 percent in North Dakota to 33 percent in Ohio. For the remaining states, the responsibilities of townships and counties for road mileage lie between these extremes. In total, townships in the North Central states are responsible for 41.3 percent of the 950,412 total rural road miles. In terms of miles of road per square mile of land area, the North Central states of Illinois, Iowa, Michigan, Missouri, Kansas, and Minnesota rank as the top six in the country (Mercier 1983).

Townships and Roads

Table 8.2 gives the general characteristics of township government in the North Central states. The number of townships varies from a high of 1,795 in Minnesota to 325 in Missouri. There are, as noted above, no townships in Iowa, while the townships in Indiana perform very limited government functions although townships exist in all 91 counties. The average township population ranges from over 5,622 in Illinois to 119 in North Dakota. A major determinant of the size of townships is whether or not they overlap with municipalities. The proportion of the population in the states under the jurisdiction of township government varies from 6.6 percent in Missouri to 100 percent in Indiana. Only 23 of Missouri's 114 counties have townships. Wisconsin, Ohio, Minnesota, and Michigan have townships in all counties.

Table 8.1. Distribution of Rural Road Responsibilities Across Jurisdictions in the North Central States

State	State	County	Township	Other local ^a	Federal ^b
	percent				
Illinois	12.9	14.6	65.9	6.4	0.2
Indiana	12.8	82.6	4.5	0.1	0.0
Iowa	8.9	85.6	0.0	5.4	0.1
Kansas ^c	8.1	63.5	26.3	2.1	0.0
Michigan	8.3	88.0	0.0	3.6	0.0
Minnesota	10.5	36.9	46.7	4.5	1.4
Missouri	29.9	52.2	17.2	0.0	0.7
Nebraska	11.4	66.2	18.7	3.6	0.1
North Dakota	8.4	10.9	77.6	2.4	0.8
Ohio	20.2	33.3	42.5	3.9	*
South Dakota	12.4	28.8	53.7	2.8	2.3
Wisconsin	11.9	20.6	63.3	4.0	0.2
U.S.	25.5	46.8	13.7	5.9	8.1

^aIncludes mileage not identified by jurisdiction.

^bMileage in federal parks, forests, and reservations not a part of state/local systems.

^cKansas county and township percentages estimated from Kansas Department of Transportation.

*Less than 0.1 percent.

Source: *Highway Statistics 1982*. U.S. Department of Transportation. Federal Highway Administration (Washington, D.C.: Government Printing Office) and Kansas Department of Transportation. unpublished mileage tables, 1983, Topeka, Kans.

Table 8.2. Townships in the North Central States

State	Units	Avg. pop.	% <1,000 people	% State pop.	No. of counties	No. of elected officials	Road functions
Illinois*	1,434	5,622	47.0	70.6	85/102	12,463	yes
Indiana	1,008	5,446	26.1	100.0	91/91	4,150	limited
Iowa					no township governments		
Kansas	1,367	573	85.6	33.1	99/105	4,347	yes
Michigan	1,245	3,159	30.1	42.5	83/83	8,356	fncl only
Minnesota	1,795	520	89.2	22.9	87/87	8,356	yes
Missouri	325	1,003	78.8	6.6	23/114	1,630	yes
Nebraska	470	457	89.6	13.7	28/93	1,423	yes
North Dakota	1,360	119	99.3	24.8	48/53	10,321	yes
Ohio	1,381	3,789	21.1	48.5	88/88	5,273	yes
South Dakota	996	153	99.4	22.2	52/64	5,051	yes
Wisconsin	1,269	1,172	64.9	31.6	72/72	8,194	yes

*There are 20 townships coterminous with cities. These jurisdictions have no road responsibilities.

Source: Bureau of the Census, *Governmental Organization*, Census of Governments, 1982 (Washington, D.C.: Government Printing Office, 1983).

The number of elected township officials in the region reported in the 1982 Census of Governments is over 70,000, with an average per township ranging from 3 in Kansas and Missouri to 8 in Illinois. Illinois and Nebraska elect officials to carry out the road function: in Illinois the official is the highway commissioner; in Nebraska, the road master. In the other states a board of trustees or supervisors is responsible for road services. In Michigan townships share financial responsibilities for roads, but the operational responsibilities are with the county road commission.

The details of township road systems are presented in Table 8.3. These data demonstrate the variation among states in the road responsibilities of townships. Illinois townships maintain over 70,000 miles of roads, followed by North Dakota with 65,548, Wisconsin with 61,136, and Minnesota with 55,329. Ohio and South Dakota have fewer miles of roadway under township jurisdiction and Iowa, Indiana, and Michigan have limited or no township road mileage. Kansas, Nebraska, and Missouri have mixed road responsibilities. Some counties have a dual system with county road networks overlaying and complementing township roads, while in other counties there are county-unit systems. For example, in Kansas 37 counties have dual systems and 68 have county-unit road networks. (The first county-unit system was organized in 1918 and the last one established in 1979). The dependence on townships for rural road services varies substantially among the dual system states. However, only in Kansas, Missouri, and Nebraska is the percent of rural road mileage under township jurisdiction less than 50. The range in the other states is from 87.6 percent in North Dakota to 55.8 percent in Minnesota.

Table 8.3. Township Road Systems in the North Central States

State	Road mileage			1982 average expenditures		
	Total	% rural	Avg.	% local rural roads	Per mile	Per capita
Illinois	71,174	96.4	50.3	82.3	\$1,772	\$78.87
Indiana	3,369	99.4	3.3	5.1	9	N/R
Iowa						
Kansas	32,564*	100.0	46.9	28.6	518	21.55
Michigan						
Minnesota	55,329	99.9	30.8	55.8	658	49.96
Missouri	19,280	92.8	59.3	23.6	415	24.53
Nebraska	16,402	100.0	34.9	22.0	361	27.56
North Dakota	65,548	99.8	48.2	87.6	172	69.43
Ohio	39,182	88.9	28.4	56.0	2,208	28.46
South Dakota	38,485	99.9	38.6	65.0	190	47.80
Wisconsin	61,136	97.6	48.2	75.4	1,883	103.30

*Estimated using Kansas Department of Transportation data.

Sources: Bureau of Census, *Finances of Municipalities and Townships 1982*, Census of Governments (Washington, D.C.: Government Printing Office, 1983) and *Highway Statistics 1982*, U.S. Department of Transportation, Federal Highway Administration (Washington, D.C.: Government Printing Office, 1983).

The very rural nature of township roads is evidenced by the high percent of mileage in this classification. The range among the states is from 100 percent in Nebraska to 88.9 percent in Ohio.

The average number of miles of road per township varies from a high of 59.3 in Missouri to a low of 28.4 in Ohio (excluding Indiana). This range indicates the generally small scale of operation found at the township level. The averages somewhat mask the variation in township mileages within the respective states. In Illinois the miles of road maintained by townships vary from less than 10 to over 100. The limited size of township operations calls to question the efficiency with which road services are provided in the dual system states. The limited research on this issue is not conclusive and is encumbered by measurement and data problems (Swanson 1956; Leshner and Mapp 1974; Lamb and Pine 1974).

Average expenditure per mile by townships in 1982 reflects service levels, financial conditions, and other factors. The general pattern of per mile outlays ranges from a low of less than \$200 per mile in North and South Dakota to close to \$2,000 per mile in Wisconsin, Illinois, and Ohio, with Nebraska, Kansas, Minnesota, and Missouri lying along the continuum. A somewhat different pattern of spending emerges with per capita outlays. Per capita spending on township roads ranged from a high of \$103.30 in Wisconsin to \$21.55 in Kansas. The two Dakotas' per capita expenditures on township roads are no longer at the low extreme, reflecting the low population density in these states.

Counties and Roads

In county-township rural road systems townships are generally responsible for routes providing a lower level of service relative to county roads. Spending per mile on county roads would be expected to be relatively greater in states where county roads were a smaller share of all rural roads. The 1982 expenditure data presented in Table 8.4 generally support this relationship. North Dakota, Min-

nesota, Ohio, Wisconsin, and Illinois, which depend more heavily on township roads, generally spend more per mile on county roads than do the other states in the region. There is little difference in the level of spending reported by the weak township states and, for example, in Iowa where all local rural roads are under county jurisdiction. The average county road mileage in the dual system states ranges from 162 miles in Illinois to 625 miles in Nebraska. Expectedly, there is a positive relationship between the percentage of rural mileage under county authority and the size of the average county road system. In total, county governments are responsible for 557,908 miles of rural roads or 59 percent of all local mileage in the North Central states.

Spending per capita and per mile by counties for road services is related to service levels, jurisdictional responsibilities, available resources, and population density. The range per mile is from over \$14,664 in Illinois to \$1,624 in Nebraska. The heavier burden of financing rural roads in low density areas (in South Dakota for example) is reflected in higher spending per capita.

The institutional arrangements for meeting local rural road demands structures, in part, the relationship between agriculture and local investments in constructing and maintaining essential road systems. These arrangements differ among and within the North Central states. Counties are responsible for the majority of local road mileage in the region but share road authority and responsibility with townships in most states. Among the states with dual local road systems, the dependence on townships is not consistent geographically within states or functionally across states. The governance system is very decentralized, with over 10,000 county and township governments responsible in some way for building, maintaining, and financing the local rural road infrastructure in the 12 North Central states.

Table 8.4. County Road Systems in the North Central States

State	No. of counties	Road mileage			1982 average expenditures		
		Total	% rural	Avg.	% local rural roads	Per mile	Per capita
Illinois	102	16,554	91.6	162	17.7	\$14,664	\$21.24
Indiana	91	65,252	93.7	717	91.4	2,198	28.44
Iowa	99	89,688	99.3	906	100.0	2,211	68.05
Kansas*	105	78,628	100.0	749	71.4	1,629	54.19
Michigan	83	88,851	91.4	1,070	100.0	3,857	37.00
Minnesota	87	45,192	96.5	519	44.2	5,604	62.14
Missouri	114	54,497	100.0	478	76.4	1,995	24.36
Nebraska	93	58,093	99.8	625	78.0	1,624	60.08
North Dakota	53	9,239	100.0	174	12.4	5,182	73.34
Ohio	88	29,397	92.8	334	44.0	8,088	22.02
South Dakota	64	20,695	99.9	323	35.0	3,094	64.46
Wisconsin	72	20,168	96.4	280	24.6	11,429	48.98

*Estimated mileage from Kansas Department of Transportation data.

Sources: Bureau of Census, *Finances of County Governments*, Census of Governments (Washington, D.C.: Government Printing Office, 1983) and *Highway Statistics 1982*, U.S. Department of Transportation, Federal Highway Administration (Washington, D.C.: Government Printing Office, 1983).

Averages mask the variation in county responsibilities in Kansas, Nebraska, and Missouri where road functions are centralized in some counties and shared with townships in other counties. For example, the 37 Kansas counties with dual road systems average 248 miles of county road; the county-unit systems in the other 68 Kansas counties average 1,195 miles per county-unit. The 749 average reported in Table 8.4 for Kansas is a mix of these conditions.

A characteristic of the local rural road system is the many miles of low volume roads and the small scale of the local rural governments with road functions. The small scale is particularly obvious in the dual system states. Reorganization proposals to address shortcomings associated with these characteristics include reducing the mileage in the system through road closings and consolidating small jurisdictions or, at the extreme, transferring all rural road responsibilities to county government as has been done in Iowa (Mercier 1983; Hartwig 1979). Legislation passed in Illinois in 1985 requires county boards to redraw township boundaries so each township has at least \$10 million in property tax assessed valuation. A referendum on the new jurisdictions will be held at the 1986 fall elections. Voter approval in all existing townships is required for consolidation, and without voter approval, the current township structure will not be altered. Basic to evaluating these policies is an understanding of local rural road demand.

Demand for Rural Road Service

A major issue facing local road jurisdictions is the need to maintain many miles of relatively infrequently traveled roads with only a small population base to finance them. Farmers use rural roads and bridges to obtain services, to move products to market, to receive purchased farm inputs, and to have access to noncontiguous fields. A recent study of township roads in Illinois, Minnesota, Ohio, and Wisconsin provides evidence about rural road service demands (Chicoine and Walzer 1985). On the average, 75 percent of the township road mileage has a traffic volume of less than 150 average daily trips (ADT). About one-third of the rural roads were in the 0 to 25 ADT category. The percent of roads in the lowest volume category was highest in Minnesota and lowest in Ohio, reflecting variations in the type of farming, the diversity of rural economies, and the population density. Low volume roads present difficulties for road jurisdictions because of the minimum standards at which roads must be maintained to safely accommodate traffic and meet agriculture transport demands not reflected in traffic volume.

In response to the variation in traffic demands, rural roads are provided at several condition levels. Aggregate surfaces are used extensively and supplemented with low and high grade bituminous surfaces. About 49 percent of the township road mileage in the four states studied has a gravel surface and 30 percent is bituminous. At the extremes, Ohio township mileage is 48 percent paved while 85 percent of the Minnesota township mileage is gravel. The road surface distribution makes a substantial difference in construction and maintenance costs.

The study of township roads also evaluated the use of these roads by farm households. From farmer survey data, about 60 percent of the farmers in the study states were found to live on township maintained roads. This is consistent with the proportion of all rural roads in these states under township jurisdiction. However, 83 percent of the responding farmers used the road system to get

to non contiguous parcels; this type of use was more important the more rented land the farmers held. Typical of the low volume nature of rural roads, farmers traveled, on an average, less than 5,000 miles per year on these routes. Of interest is the finding that for one out of five farmers, less than 10 percent of the rural road mileage traveled by the household is connected with farm business activities. In Ohio one-third of the farmers reported that less than 10 percent of their township road travel was connected with farming.

The average weight of loaded farm trucks (the most frequently used method of transporting farm products and farm inputs) traveling the township roads approximated the weight limits on state and federal routes. These limits exceed the engineered capacity of many rural roads, especially during the wet conditions common in spring and late fall. The common 15-ton capacity of rural bridges constructed before 1950 is also surpassed. The second most frequently listed vehicle used to transport products to market over rural roads was a tractor pulling one or two wagons. In most states there are no weight limits on farm equipment, and the average weight of this type of transport was reported at 20,000 pounds. In Illinois the reported weight was 27,000 pounds, which equals the loaded weight of single-axle farm trucks. In addition to weight, the width of farm equipment in transport configuration often exceeds the 16- to 18-foot widths of many local rural bridges.

The local rural road system is a link in an integrated transportation system that includes state and federal highways, railroads, and barges. The impact of such changes in the rail system as unit-trains and rail abandonment on rural roads has not been clearly quantified. One study in Nebraska concluded that the net effect of unit-trains on low volume roads was to increase the ton miles hauled over these routes and the weight per axle. The total ton miles of grain transported by Nebraska farmers was 71 percent greater in 1980 than in 1975. While a 19 percent increase was associated with increases in total grain marketed, the other demand growth was linked to the price advantage associated with unit-trains hauling to export ports (Linsenmeyer 1982).

Some evidence on the impact of rail abandonment, on producer demands for local road service is reported in the four-state township road study. An average of 38 percent of the township officials in the four states responded that rail abandonment has changed the use of rural roads by trucks. Of the townships claiming to be impacted by rail abandonment, 73 percent identified increased road wear and tear from farm traffic as a pressing problem. This was generally not the case for townships reporting little or no increased truck traffic because of rail abandonment.

In addition to the farm production-related demand, other factors have increased the demand for road services. With the consolidation of rural schools student transportation has increased. To help minimize the cost of transporting school children longer distances to fewer schools, 72- and 89-passenger school buses are used. Loaded, these vehicles weight up to 10 tons, which exceeds the weight limits on many rural bridges. Another source of increased demand for rural road services is the use of rural roads to reach off-farm employment. The four-state township road study reported 28 percent of responding farmers earned at least 50 percent of their family income off-farm. As expected, as dependence on off-farm income increases, use of rural roads for farm business decreases.

There is strong evidence showing that the demands for rural road services by production agriculture have changed substantially in recent years. Some of these changes are associated with events internal to the production marketing system. Others are related to institutional and structural changes that indirectly change the demand for rural road services. These demand changes are certainly not distributed evenly across the rural road system and impact the system in different ways. The expanded service demands combined with inflation to put pressure on the financial base of counties and townships while the planned functional life of significant parts of local road capital expired. Reorganizing the institutional structure and downsizing the system have been suggested as ways to reestablish an equilibrium between supply and demand. Implicit in the reorganization solution is the replacement of a decentralized, inefficient delivery system with a more centralized, economically operated organizational structure. The downsizing prescription implies that the geographic distribution of demand is not uniform and that by selectively removing mileage from the system, the remaining mileage would have higher service levels and be closer to equilibrium. An intermediate position has been authorized in Iowa and Kansas, where counties may institute a low maintenance program, decreasing service levels on selected parts of the rural road network (Mercier 1983).

Rural Road Spending

Nationally, maintenance and capital spending on local rural roads have grown slightly in real terms (e.g., a 4 percent increase in maintenance spending during the 1970s). This stands in sharp contrast to the trends in expenditures on state highways. To some extent these trends are related to the revenue structure financing expenditures. State highway revenues were more inelastic and, because of fuel conservation and inflation-reduced receipts, real spending on state highways declined continuously during the 1970s (Irwin 1983). The deteriorating conditions of the state highway infrastructure and the need for more user-tax revenues triggered a series of motor fuel tax and other highway user tax rate adjustments in the 1980s. In 1981, 26 states increased motor fuel taxes, with 12 states following in 1982, and 11 more in 1983. The federal tax rate also increased that year. As of August 1984, 15 states had passed legislation that year to increase funding for road purposes. The state rate changes resulted in an average state gas tax in 1984 of \$0.116 per gallon (Hazen 1983; TRIP 1984). To keep road tax receipts adjusted to general price increases, eight states converted completely or partly to an ad valorem tax from the traditional per gallon levy. Most states share fuel tax receipts with local road jurisdictions, distributed using some type of formula.

Due to different standards of construction, a higher proportion of spending goes into maintenance on local rural roads compared to state highways. Nationally, about 61 percent of all spending on local rural roads is for maintenance (Irwin 1983). A significant determinant of road spending is the type of road surface. Gravel surfaces require less initial capital investment but more maintenance expenditures compared to hard surfaced (bituminous) roadways. Research based on a 20-year planning horizon and traffic comprising cars and single-axle trucks has shown that at about 45 vehicles per day, the total overall cost—including initial construction, rehabilitation, and maintenance, and vehicle operating costs—of bituminous surfaced roads becomes less than gravel surfaced roads. Gravel surfaces are less costly when fewer than 45 vehicles per

day use the road. At about 150 vehicles per day the total cost of asphalt roads also becomes cheaper than gravel surfaces. Additional maintenance requirements and additional vehicle operating costs borne by users account for much of the additional cost associated with gravel surfaces at higher traffic volumes (Luhr and McMullough 1983).

Comparing the total road costs with surface types and traffic volume on the township roads in Illinois, Ohio, Minnesota, and Wisconsin indicates that in every state except Minnesota the proportion of roads with under 50 vehicles per day exceeds the proportion of roads with a gravel surface. For these low volume roads gravel surface is the least costly, thus suggesting that townships in Illinois, Ohio, and Wisconsin have over-invested in bituminous surfacing. The estimated percentages of township roads with more costly hard surfaces are 12.2, 24.7, and 15.1, respectively, for the three states. In contrast, the total cost of township roads could be reduced in Minnesota if about 15 percent of the local rural road mileage were upgraded to a bituminous surface.

Expenditure Trends

To compare spending on local rural roads in the North Central states requires combining the expenditures by counties and townships in the dual system states. The major urban counties are not included in the state jurisdictional totals. The rural population of the respective states was adjusted by the rural population in these same counties to obtain the rural population base used in calculating per capita rural expenditures. The results of these computations for 1962, 1972, and 1982 are presented in current dollars in Table 8.5 and in constant 1972 dollars in Table 8.6.

Table 8.5. Estimated Expenditures on County and Township Rural Roads, North Central States, 1962-1982*

	1962		1972		1982	
	Per mile	Per/cap rural	Per mile	Per/cap rural	Per mile	Per/cap rural
Plains states						
Kansas	\$ 413	\$55	\$ 518	\$ 77	\$1,133	\$179
Nebraska	373	44	601	80	1,493	196
North Dakota	236	43	310	68	788	177
South Dakota	329	47	404	65	858	137
Lake states						
Michigan	\$ 962	\$43	\$1,745	\$ 72	\$3,178	\$109
Minnesota	605	49	965	80	2,416	187
Wisconsin	1,509	86	2,744	148	4,141	201
Heartland states						
Illinois	\$ 801	\$36	\$1,502	\$ 68	\$6,612	\$161
Indiana	661	26	1,297	47	2,000	66
Iowa	781	54	965	71	2,206	100
Ohio	1,294	34	2,027	54	4,052	96
Missouri	170	9	321	18	916	46

*Expenditures exclude those of major urban counties. Only rural population considered in per capita expenditures, with the rural population of the major urban counties excluded from the base.

Sources: Rural mileage taken from *Highway Statistics*, U.S. Department of Transportation, Federal Highway Administration (Washington, D.C.: Government Printing Office) and expenditure data from various years of the U.S. Census of Governments.

Although there are difficulties involved in working with expenditure data, amounts spent on local road infrastructure are useful in understanding the relationship with agriculture. If an average expenditure level can be determined, later cost estimates for improvements can be compared. Several limitations of analyzing spending information should be mentioned, however. First, capital expenditures such as equipment are nonrecurring and make direct comparisons difficult. Capital expenditures by local rural governments in 1981 in the North Central region varied from an average of 51 percent of total outlays in Illinois and Minnesota to 22 percent in Iowa. A second difficulty is that services provided are not the same in all jurisdictions. Expenditures do not represent cost estimates because there is no direct measure of variation in service levels. In spite of these limitations, spending data can be useful in identifying the resources devoted to local rural road services.

Revenues from all sources are reflected in the expenditures. Thus, the \$3,612 per mile in Illinois in 1982 was financed with federal general revenue sharing, property taxes, federal or state bridge replacement funds, and state shared motor fuel taxes. The level of spending on local rural roads in the North Central states reported in the 1982 Census of Governments was \$2.13 billion; approximately 21 percent was spent by townships and 79 percent by county governments. In general, this amounted to \$2,243 per mile or \$129 per rural person in the 12 states. Some scale can be given to local rural road spending by comparing outlays with farm income. In 1982, the \$303 million spent on local rural Illinois roads represented about 30 percent of Illinois' farm proprietor income.

Several points are evident from the expenditure data. First is the variation in per mile outlays among the states. Local road outlays in Missouri are substantially lower than in other states in the Heartland group, with \$916 per mile reported in 1982. This exceeded only the per mile expenditures in North Dakota and South Dakota. Illinois spent the most per mile in 1982 on rural roads, followed by Ohio, Wisconsin, and Michigan; Missouri had the lowest expendi-

Table 8.6. Estimated Expenditures on County and Township Rural Roads, North Central States 1962-1982 in Constant Dollars*

	1962		1972		1982	
	Per mile	Per/cap rural	Per mile	Per/cap rural	Per mile	Per/cap rural
Plains states						
Kansas	\$ 687	\$ 92	\$ 518	\$ 77	\$ 553	\$80
Nebraska	621	73	601	80	670	88
North Dakota	393	72	310	68	354	79
South Dakota	547	78	404	65	385	61
Lake states						
Michigan	\$1,600	\$ 72	\$1,745	\$ 72	\$1,426	\$49
Minnesota	1,007	82	965	80	1,084	84
Wisconsin	2,511	143	2,744	148	1,858	90
Heartland states						
Illinois	\$1,333	\$ 60	\$1,502	\$ 68	\$1,620	\$72
Indiana	1,100	43	1,297	47	897	30
Iowa	1,300	90	965	71	990	45
Ohio	2,153	57	2,027	54	1,818	43
Missouri	283	15	321	18	411	21

*1972 dollars. See Table 8.5 for descriptive notes.

ture level. Excluding Missouri, the Plains states spend somewhat less per mile than the other states but have relatively high per capita outlays. This reflects the greater burden of maintaining large systems of low-volume roads with a small population base.

The difference in spending levels reflects, among other things, different service levels and surface types. More outlays are required for snow plowing in Minnesota, for example, than in Missouri or Ohio. While current dollar spending increased in all states over the last 20 years, the largest increases in the 1970s generally occurred in the states spending the least in 1970. For example, outlays per mile increased in nominal terms by 185 percent in Missouri, followed by North Dakota, Nebraska, and Minnesota. Wisconsin, which reported the highest expenditures at the beginning of the decade, experienced the slowest growth in local rural road spending in the 1970s.

Much of the increase in road outlays was to offset the general inflationary conditions experienced during this period. The federal highway construction index, for example, increased 129 percent between 1972 and 1982. However, as shown in Table 8.6, the growth in per mile rural road spending by local governments exceeded the general price increases in seven of the 12 North Central states. Michigan, Wisconsin, Indiana, Ohio, and South Dakota reported lower real per mile outlays in 1982 compared to 1972. The expenditure trends suggest that, in general, spending for local rural road services has kept pace with inflation and remained reasonably constant. Those states with heavy reliance on townships for services did slightly better in this regard than those with county-oriented systems. Few local government services have experienced this type of spending stability. Such expenditures reflect the importance of the rural road system to agriculture and the willingness of local jurisdictions to exert the needed efforts to provide for this critical local infrastructure.

Constant or slightly declining real spending, however, provides little flexibility to accommodate the increased demands on local road systems because of changes in agricultural technologies, alterations in other connecting transportation modes, and the obsolescence of fixed capital assets in rural bridges. Constant real spending levels per mile will not supply expanded service levels.

The perception held by farmers regarding the value of rural road services is important when options are proposed to increase revenues and the level of service in response to demand changes. One measure of the value of local road services is the voluntary amount of money road users would be willing to pay to improve service levels. One rural road study solicited willingness-to-pay information from farmers (Chicoine and Walzer 1985). For all farmers responding in the four states studied, the average voluntary contribution was \$9.98 per month. The highest state average was \$13.52 per month in Minnesota, followed by \$12.67 in Illinois, \$7.98 in Ohio, and \$5.74 in Wisconsin. This is almost the reverse order of the four states according to spending per mile listed in Table 8.3. Annualized and assuming a family of four, the willingness-to-pay response would represent a per capita expenditure increase of 81 percent in Minnesota and percentage increases of 85, 48, and 17 in the respective states of Ohio, Illinois, and Wisconsin. This indicates the perceived importance of rural road service improvements to meet farm demands.

Financing Local Road Infrastructure

When farmers were asked their preferred method of financing any needed increase in local road spending, the overwhelming preference was the motor fuel tax (Chicolne and Walzer 1985). The user-based tax approach to financing highways was initiated in 1919 when Oregon passed the first user tax on fuel. By 1929 all states had levied fuel taxes. As noted, most states share these receipts with local governments to assist in financing local road facilities. Miles of road, vehicle registrations, population, and past spending are common factors considered in state formulas used to distribute these funds to local jurisdictions. Local option wheel taxes or excise vehicle taxes are also authorized in some states as sources of local user tax revenues (Hazen 1983; Reed 1981; Fricker 1981). Other nonlocal sources supporting local road budgets include federal revenue sharing, federal bridge replacement funds, and, in some states, state bridge replacement monies. In most states the property tax plays a major role in financing local rural road expenditures. This is often a forgotten characteristic of local public finance as the issues of highway finance often focus on state fuel taxes and registration and license fees (e.g., Fricker 1981).

The dependence of local road budgets on property taxes, local revenues, and state user taxes in the North Central states is presented in Table 8.7. There is substantial variation among the states in the way local road budgets are financed. The most property tax-dependent states are Kansas, South Dakota, Missouri, Nebraska, and Illinois, with these revenues accounting for 40 to 75 percent of all receipts. The lowest property tax dependence is reported in Michigan. Generally, the high property tax states are dependent on local revenues to

Table 8.7. Property Tax Dependence in County and Township Road Finance, North Central States, 1981

Region	Property tax dependence	Local revenue dependence	State hwy user dependence
Plains states			
Kansas	74.8%	78.0%	13.6%
Nebraska	43.9	54.3	32.2
North Dakota	28.7	37.0	24.2
South Dakota	60.8	62.1	27.0
Lake states			
Michigan	1.7%	21.0%	64.1%
Minnesota	23.2	59.0	24.0
Wisconsin	22.2	73.9	19.4
Heartland states			
Illinois	40.3%	68.1%	25.3%
Indiana	9.6	32.3	61.3
Iowa	14.1	15.2	59.7
Missouri	50.9	73.0	15.2
Ohio	3.1	29.0	70.3

Source: *Highway Statistics 1982*, U.S. Department of Transportation, Federal Highway Administration (Washington, D.C.: Government Printing Office, 1983).

fund their budgets. The exception is Wisconsin, which finances local rural roads with 73.9 percent local funds but only 22.2 percent property taxes. There are some difficulties in distinguishing reported local general revenues and property taxes if property taxes are not function-specific and finance general fund expenditures that may be road services. This may account for some of the inconsistencies between the first two columns in Table 8.7.

The dependence of local rural road budgets on shared state highway user tax receipts ranges from a low of 13.6 percent of local revenues in Kansas to 70.3 percent in Ohio, Iowa, Indiana, and Michigan finance 60 percent of local road services with state-shared user taxes while Illinois, Kansas, Minnesota, Missouri, North Dakota, South Dakota, and Wisconsin receive around 25 percent or less support from this source.

The differences in financial structure will greatly influence the relationship between agriculture and the provision of local rural road services with road infrastructure. Local road jurisdictions without independent funding sources are restricted from providing services beyond the level financed with state funds regardless of local demand. Under this structure, local rural government plays a limited role in determining collective preferences for road services. Their responsibilities are reduced to effectively managing the resources provided by state government, and the direct linkage between revenue raising and service provision is disrupted and accountability weakened. Much of the policy process is shifted to the state level.

The process of sharing road revenues with local rural governments is not without some shortcomings. For example, many distribution formulas use miles of road as an indicator of need. For a system with excess mileage for current demand, there is a disincentive to close any route and forego state fuel tax revenues. When asked if routes could be closed in their area without great inconvenience, farmers in Illinois, Minnesota, Ohio, and Wisconsin indicated an average of nine miles of road and 1.5 bridges were not needed. Other state aid formulas look at past spending to determine local allocations. This type of procedure may support past inefficiencies.

On the other hand, the property tax has received severe criticism from taxpayers as an unsatisfactory local finance instrument. Innovative local rural road finance methods may be required if local jurisdictions are to respond to service demand changes effectively and efficiently. Service demands are not uniform across the rectangular local rural road grid. A major relationship between agriculture and road authorities involves the collective choice process that articulates this demand and an adequate acceptable financial structure to supply the services.

Summary and Policy Implications

Public infrastructure includes those capital assets used in the provision of government services. Some of these services are characterized as collective goods because excludability and joint consumption qualities preclude provision through markets. The condition of the capital facilities used to provide basic transportation, water, sanitary, and other services has received national attention, with the declining rate of government real capital spending used as evidence of a "crisis." While there is limited evidence on the condition of the urban infrastructure on which to base policy, there is even less known about the level and condition of public capital facilities serving agriculture and rural communities.

The major public capital asset serving agriculture directly is the local rural road system. These routes provide access to farms and farm fields, are the initial link in marketing products, and connect farms with the local community. The relationship between agriculture and the local rural road public infrastructure involves determining the collective demand for services, supporting an adequate, acceptable public finance system, and evaluating the institutional arrangements for determining service levels and operating the financial system. The demands on local rural roads have changed as farm size increased, farm numbers declined, export markets grew, and the scale of farm technologies expanded. The demand changes along with capital exhaustion caused disequilibrium between road service demand and supply in many areas.

The institutional arrangement for providing local rural road services is decentralized and involves both township and county government. Some states rely entirely on counties, while others depend heavily on townships for local rural roads. Equally as diverse is the centrality of the finance structure supporting local road budgets. At one extreme state fuel taxes are heavily relied on, and the property tax finances most road spending in other states. Whether or not the degree of centralization, financial or operational, impacts the performance of the local rural road system is an issue worthy of study.

The review of the fiscal and structural situation surrounding the provision of local roads and bridges suggests relatively few policy alternatives to move toward equilibrium. These options include service reductions, revenue increases, and efficiency improvements (see Baumel and Schornhorst 1983 or Cooper and Kane 1981). Service reductions include permanent road closings and a two-class maintenance system with low and high service routes. While, conceptually, reducing the miles of roads and numbers of bridges maintained can reduce spending, there is a disincentive for all property owners to support road closing or reduced maintenance for any road serving their property. Because of enhanced property values from road service, the incentive is for property owners to not reveal their true preferences and to attempt to keep roads serving their property at the highest service level possible. One possible alternative would be to compensate landowners impacted by closures or lower maintenance programs.

The most attractive revenue raising alternative to the farmland owner is to increase the flow of aid from state and federal government. The property tax, although it has many attributes for financing such local land benefiting services as roads, is generally not an attractive option. Another revenue raising alternative is special assessments for road services, as is now common practice for financing urban residential streets. A local option road user tax is also worthy of consideration. Indiana currently offers counties the option of imposing a local wheel tax and/or vehicle excise tax. A problem voiced with this approach in Indiana is the limited revenue production of these levies, as authorized. The additional revenue is viewed as not worth the political costs of adoption, and this has limited their use (Fricker 1983).

The more efficient use of current resources through better management, structural reorganization, and institutional cooperation is the third alternative. Implicit in this approach is the reduction in the unit cost of providing local road services. There certainly can be no argument with attempts to improve management and to provide services at a lower cost. At issue in many states is whether a centralized county road system is more efficient and cost effective than a de-

centralized dual structure of numerous small mileage townships overlaid with a county system responsible for higher level service routes. The current structural organization gives little guidance as to the best system. However, the diversity in the North Central states provides a rich opportunity to investigate alternatives and increase the understanding of the implications of current arrangements.

These policy issues and the alternatives discussed are not mutually exclusive. The relationship between agriculture and the rural road infrastructure involves policy choices included in this description. Road systems and other public infrastructures have no intrinsic value. Their value is derived from the services produced, which are demanded directly by consumers or as inputs in a production process. The determination of these demands and the financial and institutional systems for their supply provides the foundation for the interaction with agriculture and rural communities.

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Chapter 9

Social and Institutional Infrastructure: The Relationship to Agricultural Development

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One of the first questions we must ask is what is *agricultural development*? Over the past several decades, we have used the word *development* in a variety of contexts. We talk of international development, community development, resource development, or market development. Those using the word *development* assume everyone knows what they are talking about.

Within the social sciences, we have normally used development to imply improvement, growth, and/or change. Development as growth focuses upon economic prosperity and the economic transformation of a community, economic sector, or nation. This type of development is usually measured as an increase in gross national product, sales in the sector, market share, per capita income, or other concrete economic indicators.

When using development to refer to a more general type of improvement, an analyst will focus on the social and psychological transformation of a community, sector, or nation. This type of development is often measured by describing changes in quality of life, educational services, mortality, infant deaths, etc.

From experience in the international development arena, we know that economic development and social transformation go hand in hand. However, often there is not a clear causal order to these processes. In some cases, economic development has been forced upon a social order and the social order successfully altered. In other cases, the social order was not transformed and the economic development initiative was unsuccessful. Social transformations have sometimes preceded economic development and, in fact, paved the way. The most probable explanation is that the process can be initiated by either, but both must reinforce each other and change in tandem.

Domestically, we have found that economic development and an improved community are correlated. However, whether an improved community attracts economic development or whether economic development provides the resources or incentives to improve the community is unclear. Examples can be found to suggest each of the causal orders.

The question that we must address is the interrelationships between a community and continuation or development of a viable agricultural sector. But first we must take a look at this economic sector we call agriculture, especially at the basic production side of the food and fiber industry.

Agriculture has long been viewed as a different type of business operation, one in which the distinction between the home and business is fuzzy and in which farming is viewed as a combination of business and way of life. However, in recent decades, agriculture has entered the mainstream of the American economy and society.

Agriculture is not the independent sector that it used to be. Farming now requires tremendous off-farm inputs into the production process (e.g., seed, fertilizer, chemicals, machinery, etc.). Sale of production is through national

and international marketing channels, whether sold to the local co-op or an agribusines. The farmer is a heavy user of credit for both expansion of land and/or machinery base and operating capital to buy seed, fertilizer, etc. In addition, farmers have become major consumers of numerous manufactured products such as four-wheel drive tractors and trucks, snowmobiles, TV satellite dishes, VCRs, and motorcycles.

Traditionally agriculture was viewed as a value-creating industry. However, with these changes in the structure, it is now very similar to other value-added industries that use substantial external inputs. Agriculture is no longer unique nor is it isolated from other sectors of society (Paarlberg 1978). In addition, agriculture is no longer immune to the impacts of changes in the non-agricultural sectors (e.g., interest rates or embargoes). Agriculture is entwined in an international market that has created greater price instability and therefore has reduced the stability of income to farmers. Both the stability of income as well as major changes in the structure of agriculture have affected (and been affected by) aspects of the community in which they have occurred.

Communities (or our concept of community), especially rural communities, have changed considerably over the past several decades. In the past, we often thought of a small village or hamlet or even a rural township as being our community. In modern society a farmer's life is more fragmented. While the village or township may still be a relevant community, it serves fewer functions than in the past. Individual farmers are involved in more county, multi-county, or even state organizations that give them broader communities of interaction. While the scope or area of our community has enlarged, the basic elements of a community remain. ". . . [A] community is defined and best described by the following elements: (1) people (2) within a geographically bounded area (3) involved in social interaction and (4) with one or more psychological ties with each other and with the place they live." (Christenson and Robinson 1980, p.6).

American agriculturists find themselves in two vastly different types of communities. Their local community is where their children go to school; where they sell their farm products and buy inputs; where they do their banking; where they participate in community affairs; and where they or members of their family are employed in nonfarm jobs. However, the farmer or rancher is also involved in a community with a much broader context.

The broader community in which American agriculturists find themselves is a mixture of national and international interests. Agriculture is at the mercy of international exchange rates, weather around the world, production decisions made in other nations, domestic monetary and trade policy; all of these have significant impact upon demand for American farm products and price and therefore the economic well-being of agriculture. In addition, American farmers and ranchers are the focus of numerous national agricultural policies: marketing orders, import controls, price supports, and other programs designed to restrict entry into agriculture or decrease the competitive pressures within the sector.

Federal agricultural programs have always purported to be a mechanism for stabilizing prices and increasing the income of farm families. However, a large proportion of the financial support goes to relatively few farmers: those tend to be large producers, not small family operations on the margin of survival. In

addition, the income of farm families is no longer substantially below that of nonfarm families, leaving little reason to suspect that farm families require assistance to compete (Bullock 1984).

The impacts of agricultural programs are as diverse as the programs themselves. Many observers applaud our programs, and other countries try to imitate our system of agricultural experiment stations and extension services. Others decry our efforts at reducing competition because of its impact on the development of the sector. As one observer stated, "The effect of price support programs, import quotas, and other government-enforced restrictions on competition is to increase income to small groups at the expense of overall productivity and output" (Pasour 1984a). The government's role (excluding educational and research efforts) in development has largely been one of keeping inefficient producers in the sector (while keeping some potentially more efficient producers out), raising costs to consumers in the form of prices and tax dollars, and restricting development of the agricultural sector. However, the agricultural sector has undergone tremendous alterations and has developed in spite of these factors.

The local community, however broadly delineated, is the primary arena for development. While national policies are certainly important, economic growth and development policy, to be effective, must be a micro-oriented (individual, household, or firm) effort that occurs in a local community.

For many observers, development implies that means are developed to assist in moving toward some desirable end. Usually both ends and means are arrived at in some type of collective fashion. Collective decision making at the local level requires interaction of the principal actors. These actors will generally act collectively when their problems are similar and individual action would be futile. The significance of the local community and collective action is even more important when development is seen as a "public good" that is available to all, regardless of their input into the process.

Agricultural development can be divided into two types of economic development within the sector. The first type comes in the form of yield-increasing innovations (e.g., new hybrids, commercial fertilizers). The early adopters of these technologies can gain substantial benefits from increased production with relatively constant prices. The long run impact is, however, lower food prices for consumers coupled with lower prices but increased production for the producer. The second type of economic development is characterized as labor saving (e.g., mechanized equipment). Labor saving innovations lead to increased returns but are often internalized into the value of the land resource. In fact, for both types of economic agricultural development, returns from innovations will generally be internalized into land prices. In terms of demand for such innovations, this situation creates a longer lag between latent demand and effective demand because it primarily affects asset position, not current costs or returns.

In agriculture, the primary method of development in terms of economic growth has been the production and dissemination of new technologies and processes. This type of development requires interactive decision making and communication between the producers of the new technology and the users—in this case between researchers/agribusiness and farmers/ranchers. Without interactive communication between the developers and users, the new technologies may be inappropriate, unmanageable, or ignored. Production and dissemination of new technologies require continuing interaction between the

researcher and the ultimate user (e.g., the farmer). There must be a flow of information in both directions for there to be successful innovation and development.

Such communication between developers and users of new technologies as well as among users themselves does not occur in a vacuum. Also necessary is extensive communication among users, potential users, and advisers (e.g., consultants or input suppliers). This type of interaction occurs in many settings within a community, including churches, coffee shops, retail stores, voluntary community organizations, or on street corners. The community serves as a focal point for such interaction, as a common meeting place, and as a setting for continuing interaction among producers.

The necessity of the local community as an arena for such interaction is evident in conversations with farmers about their interactional patterns. Many report that they never, or only rarely, go to town just to have a cup of coffee at the elevator or local cafe. However, it is not uncommon to have to go to town for a bolt, feed, or banking services, and since they are there stop in for a cup of coffee and conversation.

This type of interaction speeds up the dissemination of information on new technologies, new production and management practices, and how national and world policies will affect their operation. The lack of this mechanism would hinder the innovation and dissemination process and thus slow the rate of agricultural development. In addition, the local community serves as an arena for more structured interaction such as extension meetings, soil and water conservation districts, or school boards.

The transformation of American agriculture has been made possible by the interactive communication among farmers, research scientists, agribusinesses, educators, and others in the industrial sector. The future development of American agriculture will depend in part on the existence of effective channels of communication.

Agriculture, as we presently know it, depends on many independent producers scattered across the nation. Although the percentage of the population engaged in agriculture continues to decline, there are still hundreds of thousands of farmers. While many are part-time and/or receive significant amounts of off-farm income, most value farming as a way of life in addition to a mechanism to earn income.

However, it is not only income, independence of action, or living on the land that motivates farmers; farmers also evaluate themselves on their integration into their community and their level of participation. A major motivation appears to be competition for community prestige and acknowledgment. Without an arena for recognition, peer support, and participation, interactional patterns will break down further and agricultural development will suffer.

Recently in the international development field there has been less attention paid to overall changes in GNP or productivity figures than to the well-being of particular people or strata. Much of this has come about because of the experiences of development projects in which the existing institutional structure could not assimilate or handle the pace of development or the rapid infusion of technical and financial resources.

In advocating any type of development, we must keep in mind that we are working with real people out there, and those people want some control over their destiny. Most of us like to participate in the process of our own develop-

ment. For effective agricultural development, agriculturalists need to be allowed, even encouraged, to be actors in the process, not passive subjects. They need to make decisions in terms of use of resources and timing of the development process.

Recent technical advances in American agriculture, the out-migration of farm families, and the demise of the smaller services/trade centers have sharply reduced the cohesiveness of many rural communities. Without some community of interaction, progress of agricultural development is slowed. Needed are grass-roots organizations, both formal and informal.

"High yielding social organizations are not less important for development than high yielding crop varieties and intensified agriculture cannot occur without intensified human organization" (Cernea 1984, p.8).

In conclusion, the role of the community in past development efforts within the agricultural sector has been a major one. Effective local communities and reasonable national policies will be essential for additional development of the agricultural sector. In addition, more attention to the interactions between local communities and national policies would assist in promoting development. For future agricultural development there are two major factors to keep in mind. First, the role of national policies (agricultural as well as monetary, trade protection, etc.) has major impacts on the progress and development of agriculture. Second, the marketing of innovations (both yield enhancing technologies as well as labor saving practices) requires coordination among the relevant actors and an effective social and institutional infrastructure. Such an infrastructure would place a premium upon interaction between researchers/developers and farmers/ranchers as well as among users.

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Chapter 10

Relationships of Nonfarm Employment to Agricultural Development

"Would you tell me please, which way I ought to go from here?" said Alice. "That depends a good deal on where you want to get to," said the Cat. "I don't much care where," said Alice. "Then it doesn't matter which way you go," said the Cat.

Lewis Carroll, *Alice in Wonderland*

Brady J. Deaton

Recognition that the vitality of rural business and industry and the agricultural base of rural communities are interrelated has not been effectively incorporated into the effort to get national economic policy "where it wants to go." The reason for this situation may be that these interrelationships are not clearly understood and that their importance has not been given sufficient emphasis. Agricultural policy has always been an important factor in the growth of nonfarm business and industry, but the interrelationships are generally not explicitly recognized and drawn into agricultural policy debate. Similarly, monetary and fiscal policies appear to be formulated without a very clear notion of their spatial implications.

These are surprising observations for a nation that has only recently completed its "westward expansion," whose inherent philosophy has strong Jeffersonian roots, and where the agrarian tradition still plucks at our heartstrings if not at our pocketbooks. I am suggesting here that it does matter both "where we want to get to" and "which way we go" as a nation and that we will be better off in terms of resource allocation and the quality of life when we recognize this more fully.

The purposes of this paper are to identify some of the most important economic and demographic factors and to delineate their significance to the sociocultural developments of rural communities. My examination of this issue leads to the following summary points:

- The interrelationships among the rural government sector, industrial, business, and service sectors of small towns and rural communities and the farming sector provide continuing economic and social strength to our society.
- Agricultural policy, trade policy, and general economic policies affect these interrelationships in different ways depending on the composition of the local, nonfarm economy and the structure and diversity of local agricultural production.

The author benefited from discussion of this topic with colleagues J. Paxton Marshall and Thomas G. Johnson, Virginia Polytechnic Institute.

- Increasingly, however, agriculture and business interrelationships are shaped by national and international economic forces.
- Farm family dependence on nonfarm employment will provide the basis for greater diversity of production methods and choice of products in U.S. agriculture and in nonfarm employment.
- Small business development and value-added enterprises linked to farming could be leading sectors contributing to renewed economic strength in small towns and rural communities. Public support for venture capital and entrepreneurship may be required to achieve this objective. All levels of formal and nonformal education will be principal contributors to such knowledge-based economic development.
- More geographic balance in population distribution, reduced levels of poverty, and expanded economic opportunity were achieved in the 1960s and 1970s.
- These hard-won gains stem from important historical links between rural and urban areas and were dependent on government spending and cumulative economic forces. Continued advancement will require appropriate technologies and institutional designs.
- Growing economic instability, reduced public support for the rural infrastructure, the changing system of income supports, and a loss of confidence in public decision making threaten the social gains of the past two decades.
- Community decisions are major determinants of the economic base and quality of rural life. Local leadership needs the support of applied research and extension in order to carry out its responsibilities for economic development.
- The information revolution currently shaping the sources and distribution of economic change in both rural and urban communities places a premium on continuing education, manpower training, and other components of human capital investments.
- The research, teaching, and extension missions of our land grant colleges and universities should be strengthened to serve the broader needs of the business and public service sectors of rural communities in recognition of their mutual interdependence with the food and resource producing sectors of society.

Purpose and Assumptions

I share Nobel Laureate Simon Kuznets's assumption that "a major function of modern sovereign government is to help channel social and political adjustments to economic growth, to modify old and create new institutional patterns that would facilitate growth while limiting its inequitable effects" (Kuznets 1977). The burden of the assumption is that we understand the relationships between public policy and economic structure in order to devise more appropriate strategies. Our challenge as social scientists is to undertake research and educational programs that further this understanding. Toward this end, my paper is organized around the following issues: (1) a historical perspective on structural interrelationships between farm and nonfarm developments; (2) two analytical concepts that must be reckoned with in order to gain an understanding of the effects of the nonfarm sector on agriculture—the risk orientation of full and part-time farmers, and cumulative growth factors driven by efficiency wages; and (3) strategies for nonfarm employment opportunity growth.

Historical Perspective

With the growing internationalization of the U.S. economy, particularly of the agricultural sector, public policy must bear the responsibility of sustaining the benefits of past structural changes in the rural economy, avoiding the social costs as much as possible, enabling local communities to cope with the pressures of economic adjustment, while simultaneously ensuring that rural communities are full partners in national economic growth. Our intent is to provide information that helps us understand these issues more fully and to identify research approaches that will be needed in order to provide a sound basis for effective economic policy at the local, state, and federal levels.

Epochs of American economic history are marked by distinguished scientific and technological achievements marred only by the social costs of unplanned and unforeseeable side effects. The industrial revolution of the past century and the agricultural transformation of the post-WW II period produced both benefits and costs as they shaped settlement patterns and the mix of economic opportunities available to rural and urban residents. The current sweeping changes brought about by marked advances in biological engineering and information systems threaten to create even greater uncertainty for the future of small towns and rural communities. Family farms and rural-based businesses appear to be bearing the brunt of associated economic adjustments. These adjustments are accentuated by the openness of the U.S. economy to worldwide competitive forces.

Farm programs of price and income supports always have been based on an overriding concern for commercial farmers—to enable them to survive the Great Depression of the 1930s, to stimulate increased output during WW II, to protect them from a sharp decline in post-war price levels, and to protect income levels threatened by the chronic problem of excess production capacity for most of the period since 1950.

Except for a brief period in the 1970s, when surging international demand reduced available food stocks, post-war public policy has attempted to reduce the level of agricultural output. Only minimal efforts were made to alleviate the most serious problems of resource adjustment as agricultural workers and farm operators were forced off the farms. These problems were most severe during the 1950s as rapid technological change offset all efforts to stabilize the farm sector. The research base for analyzing these effects and to suggest alternative economic approaches has been inadequate.

Farm programs in the 1950s and 1960s created sufficient stability of expected income to provide incentives for the rapid adoption of cost-saving machinery. In turn, labor was displaced from the farm sector in greater numbers than would have occurred in the absence of farm programs. The rapid technological changes created a cost-reducing treadmill that forced the more inefficient farmers out of business. Small sized farms were particularly affected by these changes, although their rate of demise may have been slower under the minimal income floors provided by price and income support programs. Small farm operators tended to survive more effectively than farm laborers, *per se*.

Generally speaking, the exodus of people from America's farms was probably more orderly and amenable to being planned by farm households because of the range of farm programs employed to mitigate the trends. Most of the adjustments would have occurred in any event. Strong kinship ties in urban centers and income floors provided by commodity programs enabled rural residents to search for better jobs and higher incomes at a more leisurely pace.

The implication that programs geared to commodities would alleviate low income conditions among a sizable portion of the farm sector was a misleading aspect of the policy debate. Consumers at home and abroad were the principal beneficiaries of this era of cheap food. Low income consumers benefited even more since they spend a disproportionately high amount of their income on food. Other businesses realized increasing sales as a relatively higher percentage of the consumer dollar was spent on nonfood products. In this respect, our food stamp program has been a major blessing for recipients, farmers, and the business sector.

Many changes in the structure and function of rural communities occurred over the 1940 to 1970 period due to technology, marketing, economies of size, and competitive factors unique to each sector of the economy. In spite of the massive exodus of people from rural communities and a 70 percent decline in farm employment, the total population of rural communities and small towns remained more or less constant (Jordan and Hady 1979). To some extent then, increased employment in farm-related businesses of both the private and public sectors helped offset reduced employment on the farm.

During this period, the business sector of rural communities realized a degree of benefit from the stable flow of funds derived from commodity programs. For both agriculturally-linked and consumer-oriented businesses, orderly adjustments were possible. In the absence of commodity programs, farmers would have been forced to maintain a higher liquidity position and lower their purchases of farm inputs and consumer durables. While this may have produced a higher rate of personal savings in local financial institutions, the lack of farm-driven demand would have most likely led to an even greater than normal outflow of private capital from rural to urban centers.

Agribusiness firms tend to thrive during periods of relatively stable demand for their products. In the aggregate, greater sales were realized than would have occurred in the absence of support programs. Acreage reductions due to soil bank, conservation, and land retirement programs resulted in even more intensive applications of chemicals, perhaps with deleterious environmental consequences. Essentially though, both the relative stability of farm income that increased the rate of mechanization and the greater intensity of application of fertilizers, seeds, pesticides, and insecticides led to a thriving agribusiness sector. Major uncertainties for agribusiness arose in the post-1970 period of growing instability for the agricultural economy, resulting in vertical integration and spatial realignments among farm-related businesses.

The dislocation of such large numbers of rural workers during the 1950s undoubtedly contributed to the urban crises of the 1960s, the growing disaffection with life in our major metropolitan areas, and the so-called "population turnaround" of the 1970s. The rural-urban migration process was related directly to the mechanization of American agriculture. In turn, the urban-to-rural movement of people and industry of the 1970s was made easier to some degree by the residual strength of the rural economy, which had been buoyed by a combination of farm commodity programs and transfer payments to the disproportionate numbers of the rural poor and elderly.

For a decade economists' attention focused on the role of "growth centers" as solutions to the employment needs of displaced labor from rural communities. Drawing on European thinkers, Niles Hansen and other proponents advocated

more centralized investment of public funds to create an appropriate infrastructure for job creation. The social costs of urban agglomeration and the tenacity of rural residents were not clearly foreseen. These factors, along with changes in the structure and competitiveness of American business, led to industrial deconcentration and more population dispersal in the 1970s. Clearly, the attributes of small towns have played a role in the population turnaround.

The structure of rural communities is changing, and our standard economic theory may not be sufficiently robust to either help explain these changes or to provide a basis for guiding agricultural and rural development policy. Of course, policy formulation always encompasses far more than economic theory. Nevertheless, the theory we employ as economists should be sufficiently in concert with reality to help understand the essential interrelationships between, for example, nonfarm employment creation and the nature of agricultural development. The next section will review some of the most observable spatial and sectoral changes of the past decade.

Spatial and Sectoral Changes in the Rural Economy

Three major trends characterized nonfarm employment in the 1970s: (1) a general decline in nonfarm goods production relative to service-producing industries; (2) a decline in employment growth rates in metropolitan areas, especially in the larger central cities of the upper Midwest and Northeast; and (3) a relative shift in population growth and general economic activity toward smaller metropolitan and rural areas, especially in the South and Southwest. Driven by economic base industries of manufacturing, agriculture, forestry, recreation, and retirement communities, the service-producing sectors of nonmetropolitan counties grew by 42.4 percent during the 1970s, substantially more than the 33.2 percent service sector growth of metropolitan counties (Smith and Deaton 1980).

Spatial Shifts in the Economy

The much heralded wave of new manufacturing locations and expansions that swept across rural America in the 1960s and early 1970s were concentrated in the South and West, defying earlier predictions that only urban growth centers could support such activity. The decentralization of manufacturing was accentuated in the 1960s, in part due to the abundance of relatively cheaper labor in small towns and rural areas. The labor market adjustments predicted by the standard general equilibrium theory appeared to lag so severely as to bring the theory itself into question. An unexpectedly high elasticity of labor supply in many rural areas kept wages relatively low. The labor supply elasticity is increased by the growing participation of women in the workforce, by returning migrants from urban centers, and by expanding commuter fields made possible by improved transportation and communication systems. These are important components of theoretical modifications that will be discussed elsewhere in the paper.

Sectoral Changes

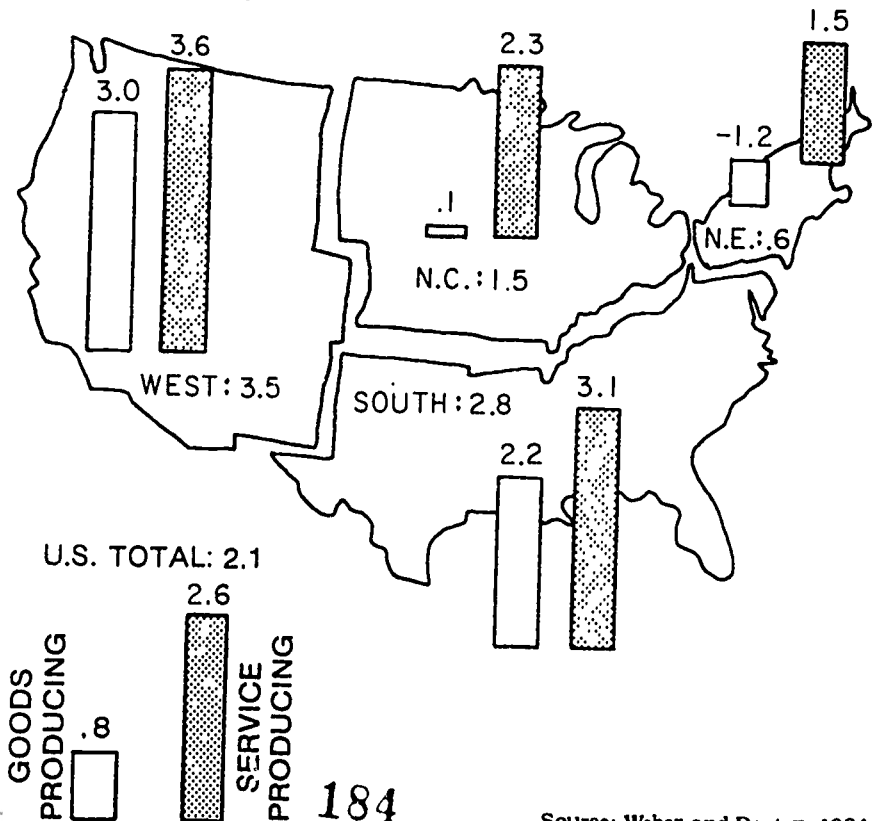
Only in the South did metropolitan service sector growth exceed nonmetro service growth (46.3 v. 44.5), and nonmetro service sector growth was clearly the leading sector of the North Central region (Smith and Deaton 1980). The regional importance of the services sector is revealed in Figure 10.1. Unlike the South, nonmetro, nonfarm employment growth in other regions of the country

was relatively stronger than metro job growth in the 1969-73 period (Figure 10.2). This difference between metro and nonmetro areas eroded quickly. It seems, as the difference in the 1973-79 period is much less than the 1969-73 period, 1.7 vs. 2.0 for the North Central region (Figure 10.2).

By March 1979, the major employment category for rural workers was in private sector services where 9 million of the 23 million rural workers were employed. This represented a 52 percent increase since 1970. The manufacturing sector employed 6 million workers and had increased 17 percent since 1970. Among the private sector services for the 1970-79 time period, trade employment increased by 48 percent; finance, insurance, and real estate (FIRE) by 58 percent; and other services by 55 percent. Other major growth sectors were mining (a 55 percent increase) and construction (53 percent growth).

The changes in nonfarm wage and salary employment over the past decade and a half provide an interesting contrast in rural and urban trends. Rural workers are now finding relatively more work opportunities in service industries rather than manufacturing or agriculture. Labor force participation by women has grown markedly, as they accounted for over two-thirds of the increase in rural employment between 1960 and 1974. In addition, longer term rural residents tend to be employed in agriculture and manufacturing, whereas recent migrants are more prevalent in construction, trade, public administration, and most notably, professional services.

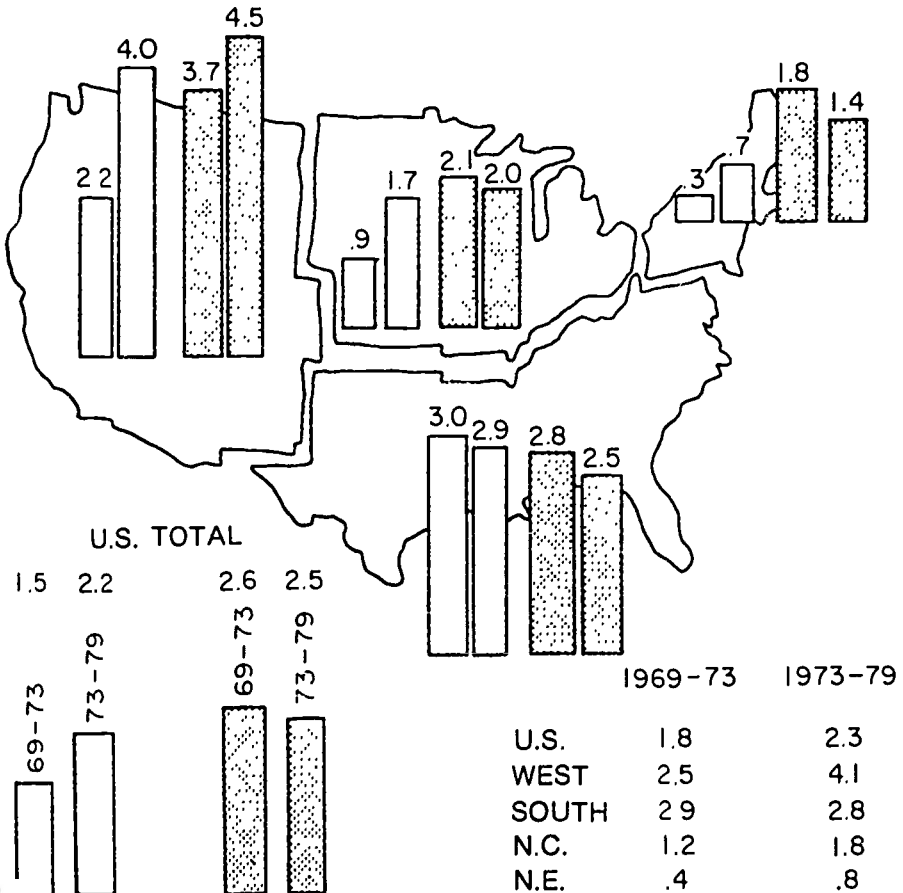
Figure 10.1. Compound Annual Rates of Growth in Nonfarm Wage and Salary Employment 1969-79



The growth of many rural communities is becoming increasingly divorced from agriculture. For other communities, agriculture is the major stimulation for business and public service activity. Clearly, agriculture serves as an economic floor of varying importance from one area to another. The farm population declined by 25 percent over the past decade and was less than 6 million people (2.6 percent of the population) by 1981. In spite of a steadily declining farm population, many rural communities have grown in population size and in economic diversity. Rural residents increasingly have the option of staying on the farm while working in manufacturing and service industries. In addition, evidence suggests that employment opportunities off the farm lead to new entrants into agriculture as part-time farmers.

The off-farm income of farm families rose three times as fast as their farm incomes during the 1960s and grew from 42 to 51 percent of farm household income by 1970. By 1980, nonfarm income represented 64 percent of farm household income and was substantially higher for small farms. Figure 10.3 illustrates the importance of off-farm income in 1981 by farm sales class. Off-farm income sustained farm income losses for all classes with gross sales below \$40,000. That is, off-farm income for these groups was above 100 percent of

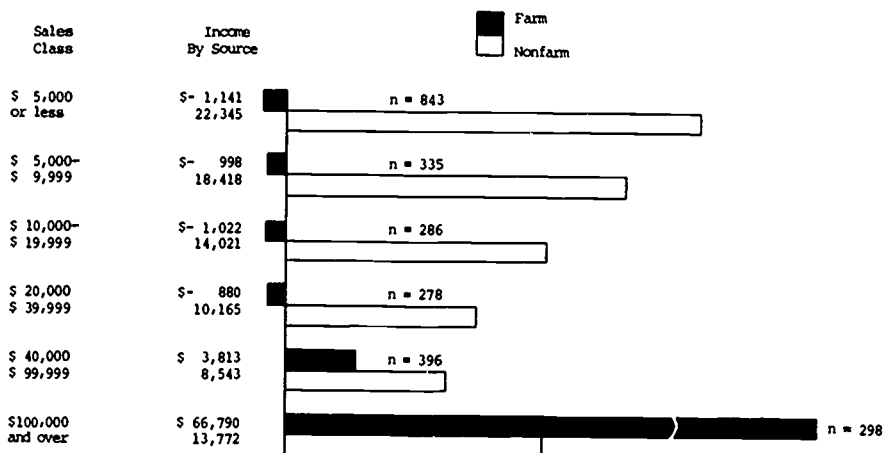
Figure 10.2. Compound Annual Rates of Growth in Nonfarm Wage and Salary Employment 1969-73, 1973-79



Source: Bluestone, 1982

family income as farm losses reduced net family income. Nonfarm income was 69 percent of family income for the \$40-99,000 sales group, but dropped to 17 percent for farms in the sales class of \$100,000 and over.

Figure 10.3. Income Per Farm Operator Family (Including Farm Households), by Major Source, by Value of Sales Class, 1981



Source: Constructed from data presented in Table 57, p. 81 of *Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1981*, USDA, ERS, Washington, D.C.

Obviously, the integration of farm and nonfarm business interests is a growing reality of rural life. Induced changes are sure to occur in farm technology and in credit institutions to meet the needs of a small-farm sector that doesn't seem to be disappearing. The subcommercial, full-time, family farmer may reap some benefits from the tenacity of this part-time farming sector, but only if economic policy supports this evolving pattern. Many farm families in the \$20,000 to \$100,000 sales range appear to be struggling for survival with limited off-farm earning levels (Figure 10.3). Clearly, a great deal of variation in well-being occurs in these and other groups.

Agricultural and Nonagricultural Interactions: Toward a New Perspective

Nonfarm employment affects agricultural development through its impacts on both the capital and labor markets and through the services provided by rural communities to the farm population. Both the public and private sectors are important here, although public services concurrently direct our analytical attention to the incidence of taxation on the agricultural sector as local property taxes are a principal source of finance for locally-provided public services, especially primary and secondary education.

The nonfarm employment sector creates additional savings that flow into local financial institutions to some degree. These buoy the potential financial base of the community, including the lending potential to the agricultural sector. Deregulation of the banking industry may have eroded the significance of

this contribution to agriculture, as relatively less farm lending appears to be occurring in integrated banks as compared to independent banks (Markley 1984).

More significant is the potential that the nonfarm sector holds for stimulating linkages on both the input and product sides of agricultural production. Lower cost inputs may be provided because of the proximity of input supply firms that gain sufficient economies of size to merit the establishment of local supply firms.

On the output side, value-added industries may be developed to stimulate further nonfarm employment. Simultaneously, this generally means greater farm profits at the local community level. Specialty crops such as grapes, apples, and other fruits and vegetables may lend themselves to this potential, although major grain crops are not exempt. New technological processes are likely to emerge as attention is given to such specialty crops. Also, venture capital can play a vital role in stimulating new entrepreneurial efforts in this area (Deaton 1982; Johnson 1984).

The labor market interrelationships have implications for the future capital intensity of agricultural production, at least for some aspects of production. Higher capital/labor ratios for part-time farmers have been almost universally observed in empirical research reported by OECD, 1977 and 1978; Schneeburger, Comer, and Edwards; and Johnson and O'Grady (Johnson 1984). Also, part-time farming has been tied to lower per acre production of agricultural products, a logical consequence of the higher opportunity cost of labor.

Theoretically, nonfarm employment opportunities create competition for own-farm use of labor and would tend to result in a steeper supply curve for own-farm employment. As Johnson recently illustrated, higher net returns to off-farm employment would tend to have the following effects:

1. The amount of family labor supplied to the total of both farm and nonfarm sectors would increase;
2. The labor allocated to the farm's enterprises is reduced; and
3. The value of labor's on-farm marginal product increases until it equals the net off-farm wage rate (Johnson 1984).

Variations by Types of Farm

Johnson also argued that the farm effects of off-farm employment will vary by type of farm, resulting in the substitution of capital for labor in all enterprises, which will in turn favor those enterprises requiring relatively less labor (Johnson 1984). Hence, different enterprise mixes and different factor intensities may be equally optimal, depending on the relative capital intensities of different farming enterprises and variations in the stock of human capital within the farm household.

This observation appears to hold profound implications for future agricultural and rural development policy and places a premium on human capital investments. First, the growing incidence of nonfarm employment introduces the opportunity for greater diversity of production methods and choice of products in U.S. agriculture. Thomas Urban recognized that this diversity was growing in his call for a "New Social Contract with Rural America." A Wisconsin dairy farmer is just not the same as a Virginia dairy farmer when viewed in this context. The availability of suitable off-farm employment simultaneously deter-

mines both the extent of household participation in off-farm jobs and the nature of the farming enterprise (Johnson 1984). In turn, the relative utilization of capital and labor in nonfarm enterprises alters the labor interdependence between the farm and nonfarm sectors and creates incentives for a variety of capital/labor ratios in each sector.

Briefly stated, then, we should recognize that nonfarm employment opportunities mean different things to different families. Some families use nonfarm income as a means of entering agriculture. Others use it as a means of transition out of agriculture. For many families, nonfarm employment is not a viable option because of the lack of marketable skills in the family, perhaps due to age and disabilities. Building on these ideas, the next section discusses two important theoretical concepts that provide different vantage points for assessing farm-nonfarm interactions.

Two Analytical Concepts

My synthesis of the policy literature on farm-nonfarm interactions leads me to focus on two analytical issues that may hold significant implications for agricultural research and extension and for future public policy. I offer these in hopes that further dialogue can be generated on ideas that are, at this time, of a tentative, cursory nature. The first issue pertains to the changing risk environment for a significant proportion of U.S. farm families. The second addresses the concept of efficiency wages in rural areas.

The Changing Risk Environment

Different classification schemes have been provided recently to help illustrate the different impacts of and needs for public policies. I believe they also help clarify important differences in risk orientation. Patterson and Marshall (1984) proposed a classification scheme for small farms based on the sufficiency of family income relative to the poverty line and the source of income. In their classification scheme, Type-I farms have elderly owner-operators (65 or older) with insufficient income, who depend essentially on farm generated income. Type-II farms have younger owner-operators who earn insufficient family income on the farm and have no nonfarm work. Type-III farms depend upon both farm and nonfarm income for family support and have adequate family incomes. Type-IV farms can support a family from off-farm sources but continue to produce on the farm. Type-V farms are strictly commercial and provide sufficient family support.

Johnson (1984) modified this scheme somewhat to account for differences in human and nonhuman capital, thereby explicitly introducing the concept of underemployment. Any farm family unable to obtain off-farm employment due to their low level of social or work-related skills was put into Type I and considered unemployable. Type-II farms were divided into two groups based on whether or not nonfarm job opportunities were available even though both groups had adequate job skills. His resulting five-group scheme provided a more explicit base for analyzing the impacts of alternative research strategies and different policy strategies, particularly job training programs.

The Patterson/Marshall/Johnson classification schemes reveal the heterogeneous nature of American agriculture and the need for diverse public policies. Johnson specified four such policies:

1. Policies that enhance the quality of life of the elderly and disabled, perhaps even maintaining their farm viability through subsidies;
2. Policies that promote human capital development in farm families that will most likely increase the productivity of family labor on and off the farm;
3. Policies that encourage the nonfarm economic development of rural areas; and
4. Policies that support part-time farmers, including research that clarifies equity as well as efficiency objects.

Jus and Zilberman (1984) classified farmers on the basis of "several important regimes of behaviour" that are designed to provide a basis for interpreting risk-oriented behavior. They specified the following major types of farms:

1. Technologically lagging farms that do not readily adopt new technologies;
2. Highly leveraged farms that are sufficiently large to spread effectively the fixed costs of adoption but possess insufficient credit to make all of the capital investments they desire;
3. Risk diversifying farms that are of sufficient scale and credit worthiness to make new technologies economically attractive but that are sufficiently risk-averse to avoid specialization; and
4. Specialized modern farms similar to number 3, but sufficiently risk-taking to make specialization attractive.

They argue that "small and part-time farmers may tend to fall into the first group, young expanding farmers may tend to fall into the second group, older large farmers may tend to fall into the third class, and large aggressive or corporate farms may tend to fall into the fourth category" (pp. 4-5).

This classification scheme was used to illustrate the distributional implications of agricultural policies between producers and consumers. The response of supply to increased price supports, the stability of consumer prices and government costs, and the income distribution effects will vary with the relative structure of the agricultural sector. Jus and Zilberman argue that policies designed to simultaneously achieve growth and equity must be based on the joint distribution of farm size, risk preferences, and credit availability.

To these considerations must be added the complexities of household labor allocation between the farm and nonfarm sector. Farm size, risk preferences, and farm credit availability almost certainly alter the household members' desires to participate in nonfarm employment. For example, risk averse farmers may be more likely to participate in nonfarm employment. They create a more elastic labor supply for the nonfarm sector at relatively low wages. At the same time, the more secure nonfarm income stream should create a more conducive environment for adopting relatively more capital intensive on-farm technologies. Therefore, in the face of growing uncertainties facing agriculture and growing nonfarm employment opportunities, we are likely to see greater diversity emerging in many sectors of the agricultural economy.

Specifically, I believe we are likely to see transitions from traditional to more innovative cropping patterns occurring more rapidly and smoothly in those parts of the country where nonfarm job opportunities are more prevalent. Moreover, in areas such as southwest and southside Virginia, where tobacco is still an important cash crop and alternative cropping patterns are being explored, the transition into new crops may be impeded unless nonfarm opportunities are available to reduce the income risk associated with the new farm practices, marketing systems, and technologies that will be involved.

The intergenerational consequences of alternative economic structures should be recognized. Major community institutions are shaped to provide intergenerational support for social changes that affect the next generation. Education, courts, recreational facilities, and most long-term investments in social and economic infrastructure attest to this objective. Clearly, this concern holds implications for the integration of farm and nonfarm life. Greater diversity of job opportunities, both within agriculture and between the farm and nonfarm sectors, is more likely to provide for occupational choice and for an appropriate ladder of economic opportunity for all members of the community, especially low-income families and minorities.

This would appear to provide one of the most urgent rationales for balanced economic growth in rural communities. A healthy agriculture requires healthy communities to provide support services and complementary job opportunities. Nonfarm employment opportunities make it more likely that appropriate technologies will be adopted because of the reduced risk of the adoption decision. These objectives can not be readily achieved unless spatially balanced job opportunities are provided.

Efficiency Wages: Toward an Alternative Theoretical Perspective

Neoclassical economic theory suggests that rates of economic growth among regions of the country, including rural and urban regions, will tend to converge over time. In a system with no technological progress, rates of growth of output, capital, and labor will tend to be equal. The decades of the 1970s and the early 1980s have experienced anything but a convergence in these rates of growth. The historical population turnaround and shift in manufacturing industries is not explainable by either population responses to differential wage rates, capital responses to cheaper labor, or movements to accommodate the product cycle of industrial stages, although clearly elements of each are at play in the process. One is tempted to cite Kuhn's *Structure of Scientific Revolutions* and suggest that the inconsistencies of theory and fact in rural economic development are sufficient to merit a careful search for alternative explanations.

More fundamentally, it appears that people's attachment to rural and middle-sized communities is revealing itself in new ways with important implications for research, extension, and public policy. Two related forces can be identified to help explain the changing economic structure of rural communities. First, Americans have long demonstrated a strong psychic attachment to the social assets most characteristic of small towns and rural areas. This agrarian tradition has persisted over several generations with surprising strength. It takes on new forms and is manifested in different ways from time to time, but ultimately it is a major factor shaping resource allocation in the economy. Among these amenities are family and kinship ties sometimes unique to particular cultural and ethnic groups. More important, perhaps, to the process of preference revelation is that rural areas are perceived to have reduced levels of the disamenities

prevalent in larger urban places. Among these are less air and noise pollution, reduced fear of crime, ease of commuting from home to work, and less interpersonal strife.

Diverse evidence suggests the importance of public goods in migration decisions and the resulting wage rates. Deaton, Morgan, and Ansel (1982) reported results that support the notions that migration decisions are in part dependent on the level of public goods available in a location and that people are willing to sacrifice money income in order to achieve a higher quality of life. Similarly, Stevens (1980) found, in a nonmetro sample in Oregon, that three-fourths of the in-migrant households in the labor market had sacrificed income in order to live in southern Oregon. He found that environmental amenities were a major factor responsible for these moves.

These factor preferences for rural, social assets are expressed in economic terms by the willingness of rural workers to accept a lower wage for doing the same work in a rural or small town location as compared to an urban location (Deaton, Morgan, and Ansel 1982; Hoch 1979; Stevens 1980). Since industrial production activities can be carried out in small towns and rural areas with equal or perhaps greater efficiency, the lower wages (W) serve to further stimulate economic expansion of industries whose products are sold competitively with the output of urban-based plants. Other research has revealed a shift in productivity (P) toward rural areas (Moomaw 1982). Hence a declining "efficiency wage" results in greater profitability for rural-based firms and has a cumulative, positive effect on the economic growth of small towns and rural areas. This can be briefly summarized in the relationship:

$$y = f(x, d)$$

where the rate of growth of output is a function of both export (x) and domestic production (d) growth. In turn, both x and d are functions of the efficiency wage (W/P) or the ratio of money wages (W) to a productivity index (P) that declines with the growth of output (Y). Hence, the cumulative relationship between output (Y) and efficiency wage (W/P) is established.

Most research on this question points to the lowest efficiency wages in communities of 10,000 to 25,000 population (Hoch 1979). Communities in this population range, for example, experienced the highest incidence of industrial growth in the nonmetropolitan counties of Kentucky and Tennessee during the early 1970s (Smith and Klindt 1981). This range appeared to be associated with the manufacturing agglomerations that were significant predictors of manufacturing locations in Kriesel's study of rural Virginia over the 1979-81 time period (Kriesel 1984).

In recent studies, Deaton (1982) and Weber and Deaton (1984) offered interpretations of the importance of this efficiency wage for rural nonfarm economic growth. Weber and Deaton modified Richardson's regional growth model (Richardson 1979) by drawing on Myrdal and Kaldor's theory of cumulative causation, including differential money wages and government spending in a respecified model (Myrdal 1957; Kaldor 1970). Briefly, the Kaldor model introduces the Verdoorn relationship, a measure of growth induced economies of size, which allows regions to grow indefinitely at different rates or even at diverging growth rates. Rapidly growing regions may generate an environment in which productivity gains can be maintained and enhanced, enabling a region that gains an initial advantage to cumulatively build on that advantage through the process of increasing returns in a way that cannot be duplicated in slower growing regions.

In formalizing Kaldor's model, Dixon and Thirwall (1975) ignored the government sector and its importance in differential regional growth. Swales (1983) incorporated government spending as an exogenous factor in an extension of the Dixon-Thirwall model. Weber and Deaton extended these models by introducing government spending as an endogenous factor that alters the rate of growth of the average product of labor.

Weber and Deaton argued that cumulative growth processes appear to be consistent with recent U.S. experience. In their extension of the cumulative causation model, they argued that the important roles of the government sector could be effectively incorporated into the model in a number of alternative ways. Government plays an important role in determining the rate of growth of labor productivity in a region. Labor productivity can increase because of a better trained and educated labor force, because of technological advances that enable a given amount of labor and capital to produce more output, because of the application of more capital per labor-hour, and/or because labor is more satisfied and motivated. The public sector affects labor productivity through each of these factors.

The federal government funds education, training, and research in ways that are designed not to favor one region over another. However, this education and research can affect different regions differently by stimulating certain industrial sectors more than others and by favoring regions with industrial bases in the favored industries. More important, the federal investments in infrastructure (for example, roads, water, sewer, airports) increase the rates of return to capital in regions where investments are made. This stimulates private capital investments in these regions that, in turn, will tend to increase average labor productivity in the recipient regions. Improvements in transportation and public services that lower industries' operating costs are consistent with this argument.

Local government investments have a significant effect on regional growth differentials as well. Differences in local spending on education, local infrastructure, and local services can affect productivity by increasing the quality of the work force, by stimulating private investment, and by increasing the local quality of life. The induced effect of federal expenditures on local revenue generation should not be ignored. Briefly stated, government spending is presumed to affect both the quality of human capital in the region—as investments in education make labor more productive and enable firms to pay higher wages—and the willingness of workers to live there as government spending affects the supply of public goods in a region and thus the supply curve of labor.

Rural-based social assets and infrastructure provided by government spending would appear to provide a more secure environment for alternative technology adoption. Therefore, it is important that risk aversion be assessed within the context of these factors. Variations in types of farms and types of risk orientation should affect the allocation of household labor between farm and nonfarm employment. In turn, these factors will alter capital/labor ratios in both sectors, provide more secure environments for innovative and appropriate technology, and, in general, should provide the basis for enhanced quality of life for all members of society.

Strategies for Nonfarm Employment Opportunity Growth

Barkley (1984) recently observed that a rigid neoclassical view "about the existence of 13,000 towns in which some forms of capital have near zero opportunity costs" would lead to the recommendation that some of them be closed and their population moved to more viable communities as Hansen (1971) and others recommended. Barkley rejects this prescription as neither popular nor realistic and calls for policies based on a better understanding of human, institutional, and infrastructural (social) capital. While he questions the importance of rural amenities as a causal force in the population turnaround, the evidence cited above would appear to lend credence to their role.

Capital and amenities in my view are the two forces, not unrelated, that hold the key to nonfarm employment growth. To a substantial degree amenities are sustained by appropriate public investments in infrastructure. Rural amenities serve as locational constants that help create a favorable environment for attracting new manufacturing plants and stimulating business and industry expansion. Both capital and amenities are being rapidly altered by technological change, the internationalization of the U.S. economy, and federal government policies.

The Importance of Community Decisions

Most states are currently engaged in vigorous efforts to reshape and redefine their economic development efforts, as new strategies appear to be needed, given the structural changes that now confront the U.S. economy. The fervor of these efforts is kindled, in part, by the high stakes being pursued in an environment of intense and sometimes bitter competition among states. This competition is also evident within states as counties and cities vie for new industry through sometimes counterproductive investments in infrastructure and tax incentives that erode local vitality.

Human and institutional capital are essential ingredients of local economic development efforts to attract new manufacturing plants and promote local economic growth. Such leadership helps organize local, state, and federal resources that strengthen a community's appeal. Applied research provides some guidelines for determining which decisions really count. Investments in industrial sites to develop water, sewage, and transportation access are critical incentives for attracting manufacturing plants (Smith, Deaton, and Kelch 1978; Kriesel 1984; Deaton 1982; Johnson 1984). Other important local investments of statistical significance in various location studies include offers of industrial revenue bonds, fire protection services, quality educational achievement, organized development groups, and educational institutions.

Stinson (1983) recently reviewed the rationale for the public sector's increasing role in the recruitment process. First, offers of such incentives as free land, low-cost financing, specialized infrastructure, and tax holidays require public action. The public good nature of industrial development activity provides further justification for public investments in order to approach a more socially optimal level of investment. Stinson also identified the public role in lowering information costs to the private sector and discussed the evolution that has occurred in the permitting process and in the assessments of economic impacts of economic change.

Institutional Innovations: A Virginia Case

Across the nation, states and localities are initiating new approaches to economic development that merit our careful scrutiny. The Rural Virginia Development Foundation (RVDF) is one of these. The RVDF represents an integrated approach to human capital development, venture capital, and technology transfer directed toward pilot projects that add value to agricultural and natural resources in rural communities. It is designed to draw heavily on private investments with minimum government subsidies. I want to provide a brief synopsis of the objectives and proposed structure of the RVDF.

A bill (Senate Bill 279) to establish the foundation was passed by both houses of the Virginia legislature in 1984 and was signed by the governor on April 10, 1984. One of the key philosophies of the foundation is to assist in the development of businesses that are compatible with a given area's resources and with the needs and desires of local people and local officials. The three objectives of the foundation are:

1. To provide access to sufficient operating and debt capital for new and expanding small business in rural Virginia, and to target investments towards agricultural and natural resource related businesses;
2. To encourage the development of a human capital program that insures the delivery of targeted and coordinated leadership and manpower training activities. These programs should be designed to meet the emerging needs of the rural businesses, especially those enterprises developed by programs initiated under the first objective; and
3. To identify emerging needs and technological changes that generate products and services that can be produced by rural enterprises in Virginia.

Objective 1: Role of the Economic Development Committee

The Economic Development Committee (EDC) of the foundation is charged with the task of creating access to sufficient operating and debt capital for small businesses in rural Virginia and targeting investments toward agricultural and natural resource related businesses. The EDC will attempt to develop business enterprises based on new products, markets, and uses for existing products.

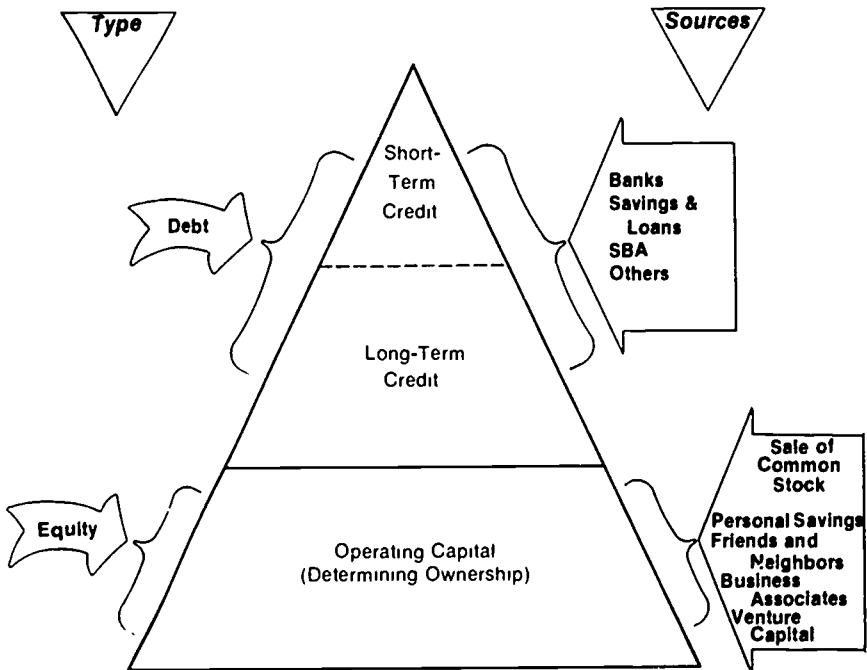
The emphasis of the EDC will be on expanding "value added" activities of the agricultural and natural resource base of local economies. The approach will be to build on and further develop local entrepreneurial capabilities, management, and resources. Using the resources of venture capital corporations, the risk of these new ventures can be pooled. By complementing the capital with technical and management assistance, overall risk will be reduced.

The EDC will further help identify emerging technological trends that can enhance the income position of rural Virginians by coordinating its activities with the private sector, planning district commissions, the colleges and universities of the state, and the Virginia Cooperative Extension Service. Efforts will be directed specifically to those businesses that appear likely to promote balanced economic growth and a healthy interaction between farm and nonfarm business sectors. Food processing businesses, wood products industries, computer-assisted marketing arrangements, and other businesses that modify existing products to make them more accessible to domestic and foreign markets are examples of ventures the EDC will consider.

A major function of the EDC will be to establish one or more for-profit venture capital corporations (VEDCORPs). They will provide loans, engage in equity financing, and guarantee loans to firms in rural areas of the state. Special emphasis will be placed on providing support to new entrepreneurs and small business ventures, although the needs of established firms desiring to expand will not be ignored. In addition to providing financial assistance, these VEDCORPs, with assistance from RVDF, will assist businesses by providing financial planning, general planning, and various types of management expertise.

This venture capital approach is based on the assumption that equity finance (primarily for operating capital) is the fundamental aspect of an effective financial support system for small business development (Figure 10.4). According to the *Economist*, the rate of return on venture capital in the U.S. is in the range of 50 percent and the success rate of the businesses they finance is above 70 percent, far higher than initial expectations. Clearly, from an economic perspective, more capital needs to flow into the venture capital arena to bring down these high rates of return and to serve a broader spectrum of the development needs of the country.

Figure 10.4. The Capital Needs Financial Pyramid



A working philosophy of these VEDCORPs, similar to that of most private venture capital companies, will be to remove themselves from part ownership of a given business as soon as the business becomes fully operational from a profit point of view. Thus, the VEDCORPs would sell their common stock in established businesses so the businesses could subsequently be privately owned and operated without VEDCORP involvement.

A major leadership role by RVDF will be required for a VEDCORP to attract a sufficient capital base. The major support will come from local private investors, private industries, and local governments and development authorities. We anticipate that VEDCORPs will offer counties an alternative means of supporting and encouraging local development by allowing them to either invest in or "purchase" development assistance from a VEDCORP. The funds obtained from localities will be used as equity capital by VEDCORP to invest in businesses in the localities. In addition, federal agencies will be encouraged to provide funds through grants or loans to the RVDF. The foundation will, in turn, provide funds to the VEDCORP in exchange for equity stock. Principal sources of such funds may include the Farmers Home Administration, the Department of Housing and Urban Development, and the Small Business Administration.

Objective 2: Role of the Human Capital Development Committee

The second objective of RVDF will be the responsibility of the Human Capital Development Committee (HCDC). The HCDC will pursue programs that ensure the delivery of coordinated leadership and manpower training activities and efforts. This committee will encourage the development of programs designed to identify and train entrepreneurs and to upgrade the labor and management skills needed to serve the future economic needs of the public and private sectors of the Commonwealth of Virginia. Coordination with existing state and federal agencies will be emphasized, and the resources of Virginia's four year colleges and universities and community colleges will also be utilized.

The HCDC will improve quality of life directly by increasing investment in human capital and indirectly by increasing the productivity of the labor and managerial forces, thereby increasing the value of labor and wages. The committee will identify and coordinate relevant aspects of existing human capital programs as well as initiate new programs designed to promote the objectives of the RVDF, particularly efforts to promote entrepreneurial identification and training.

This committee will coordinate managerial and manpower training programs that improve efficiency and productivity in the private sector and promote capacity building development of local governments. Systematic efforts will be undertaken to upgrade the quality of human capital by targeting training programs toward the emerging needs of local governments, business, and industry. A program of entrepreneurial identification will be undertaken in conjunction with colleges of agriculture and programs of human resource development, business administration, engineering, public administration, and planning.

Objective 3: Role of the Resources Coordinating Committee

The Resources Coordinating Committee (RCC) will be responsible for the third objective. The committee will identify emerging needs and technological changes that generate products and services that can be produced by rural

enterprises. The RCC will maintain close coordination with the Virginia Rural Development and Capacity Building Council, state agencies, local governments, planning district commissions, the Agribusiness Council, state and local chambers of commerce, and other private organizations and groups.

The RCC will be aided by ad hoc task forces designed to identify problems, develop alternative approaches to their solution, and generally serve in a "think-tank" capacity to deal with the emerging needs of rural communities. Members of the think-tanks will be individuals who are, through experience, academic training, or self-study, committed to examining creative new approaches to economic change, community development, and improved quality of life. The RCC will direct the "think-tanks" in such a manner that they support related efforts of the RVDF.

The RCC will draw on volunteer groups and private agencies to gain insight into new approaches to problem-solving that are based on grassroots involvement. Extension programs, community colleges, and other educational institutions may provide useful and practical applications of knowledge. Emerging technology for new rural business and industry can be identified and production schemes established. This economic-educational linkage will serve to enhance the economic and social interests of rural areas.

The RCC will function as a collector, disseminator, and medium for information and ideas. The committee will collect, evaluate, project, and disseminate information through its task forces. These task forces in turn will attempt systematically to obtain information on pilot projects and experimental efforts that may prove successful in rural Virginia. As the RVDF's extension arm, the RCC will disseminate information relating to enterprise and human development. Finally, it will serve as a medium for transmitting ideas and information that should be shared with various agencies of federal, state, and local governments. The intent is to give life and energy to innovative ideas and apply knowledge gained from experimental efforts.

Concluding Observations

A distinctive aspect of rural development is its targeted focus on the particular needs of rural people, their communities, and their specific socio-economic circumstances. In these concluding thoughts, I want to call attention to the need for targeting economic objectives to improve life quality for the economically disadvantaged and to address the hard-core economic problems of rural areas, particularly in view of the recent increases in poverty being revealed (Southern Regional Council, North Central Regional Center for Rural Development). This section will briefly outline four strategies that may be useful to state and local governments as a basis for promoting quality economic development.

Develop a high-quality educational system at all levels.

The most fundamental incentive for quality economic development is a state's educational quality. The direct effects of a more productive, motivated labor force are less important than the longer term benefits of producing quality decision makers. In a democratic society, knowledge is used to choose and discriminate among economic alternatives and to build social institutions that support productive enterprise. The state's educational system should address lifelong educational needs through both formal and informal approaches. This aspect of social and economic development undergirds the remaining three points.

Use scientific knowledge to build on the state's comparative advantage.

Rather than blindly pursuing some vaguely defined notion of "high-tech" industrial growth, state governments should promote application of the most advanced scientific knowledge within those industries that currently represent a significant part of the state's economy. Developing creative partnerships among state government, universities, and the private sector is an important component of this strategy in order to ensure that existing knowledge is successfully extended and applied and that new knowledge is generated in response to social needs. New institutional arrangements may be necessary to effectively bring this about.

State governments should recognize that a comparative advantage is usually held by those industries that currently play major roles in their states' economies. Further, scientific developments are occurring across a broad range of conceptual fields. Many of these hold significant implications for even the most traditional industries in the state.

Small prototype plants established around scientifically based, experimental designs have the potential of rapid growth and/or widespread application in existing industry. Scientific knowledge is essential for upgrading technologies in such sectors as agriculture, chemical processing, forest products, and textile and fabrics in order to preserve their competitiveness under international economic pressures. During the interim, state support in the form of low-interest loans and/or direct equity investments may be justified.

This process of scientific application should not be limited to the natural and physical sciences. Contributions from the social sciences may be even more significant for promoting economic efficiency and avoiding high social costs. Social science disciplines create new knowledge of management-worker relationships, productivity, community-industry interaction, family functioning, and institution-building—all of which may play vital roles in stimulating industrial productivity and creating a favorable environment for quality economic growth. Social science analyses have been conducted to determine impacts of economic change; such applications help avoid undesirable economic alternatives and support sound growth objectives.

Create a venture capital capability that will target specific regions and sectors of the state's economy.

Venture capital is an American success story. The high rate of economic viability among businesses supported by venture capital and the financial returns to equity owners in venture capital firms attest to this success. The ability of such firms to provide a unique mix of capital needs and management expertise to new and existing firms, often associated with innovative entrepreneurial efforts, appears to be the secret. Venture capital and entrepreneurial support programs can revitalize the economy by promoting more widespread ownership of equity capital.

State governments are in a position to develop creative public-private sector partnerships to meet this need. In addition, the involvement of state governments provides an opportunity to guide the efforts of such firms towards the hard-core areas of the economy where chronic unemployment and persistent poverty continue to impede progress toward a quality society.

The evidence seems clear that the spirit of entrepreneurship is sufficient to support significant growth in small businesses in most states. Public efforts may be needed, however, to identify these entrepreneurs and to develop and provide programs of training, product development, and related business support. Land-grant colleges and universities should be major actors in this process. The Rural Virginia Development Foundation discussed above is illustrative of the potential in this area.

New institutional/administrative designs are needed to coordinate the interrelated functions of capital investment, applications of scientific knowledge, and development of human capital.

Coordination among levels of government and between the public and private sectors has been emphasized. New forms of administrative efforts and institutional design must be developed, monitored, and evaluated continually. A spirit of experimental innovation should be promoted, not in a frivolous waste of always scarce resources, but in an attempt to discover new social designs that effectively address seemingly intractable economic and social problems.

Conflicts over basic constitutional matters are likely to arise. We have seen the beginning of such issues in Florida, North Carolina, and Virginia as the question of the appropriateness of state and local government participation as equity owners in state-directed investment funds is debated. These constitutional issues strike at the basic foundations by which society continually reshapes its economy. The judicial system is likely to play an even more visible role in future state economic development efforts.

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Comments on Session III: Community Development and Agriculture

Lyle Schertz

The three papers in this session contribute importantly to this conference. They increase our awareness that our society is complex and that interdependencies are pervasive. They stimulate me also to point out that: (1) the attention of the U.S. land-grant/USDA system to topics covered by these three papers is relatively limited, especially compared with our attention to the economics of commodities; (2) variables that formerly changed only slowly are now volatile, with significant implications for rural communities and farm operators, since a possible outcome of current domestic and international conditions is a loss of comparative advantage for U.S. agriculture; and (3) unequal changes in prices of land, labor, and capital goods, and related credit costs, could drastically influence how farming and rural communities are organized. I will focus on each of these points in my discussion here. In addition to making brief comments on the three papers.

The Papers Add Important Perspectives

Chicoine, Deaton, Lovejoy, and Ayres help us understand the full reality of rural communities when they discuss employment, roads, and institutions in rural communities. These are all key variables affecting prosperity of rural people, farm and nonfarm. These conditions do matter and I am glad these authors and these papers were included in this program.

Chicoine's paper directs our attention to one of the infrastructures important to farming and rural communities—roads—and to the social and political institutions controlling them. Deaton's paper reminds us that agricultural production activities generate nonfarm jobs and, vice versa, nonfarm employment opportunities can contribute income flows vital to the economic welfare of farm families. Lovejoy and Ayres' paper focuses on institutions and how these institutions influence selections among policy alternatives.

Attention to Factor Markets Is Inadequate

This particular program, like similar programs focused on these aspects of rural America, suffers from limited data, analyses, and research. There is a difference between papers typically presented at conferences focused on agricultural commodities and papers at conferences, such as this one, focused on employment, infrastructure, and institutions. Commodity conferences give great attention to relationships and the quantification of these relationships.

Note, for example, that Deaton argues that national economic policy has not adequately recognized the interrelatedness of the "vitality of rural business and industry and the agricultural base of rural communities." But you look in vain for any insight about how the current financial stress of some farmers will affect input suppliers, product handlers, and employment on main street rural America and on specific relationships that would facilitate understanding of how these effects will unfold.

The information revolution, we're told, is important to human capital investments. But details are missing. Chicoine's discussion of roads focuses our attention on miles of road and numbers of bridges in varying conditions. This information, while useful, is not sufficient. Wise public decision making needs

analytical information about what difference it would make to whom if, say, half the bridges were not repaired and a third of the rural roads were closed.

These criticisms are harsh but do not interpret them as directed at the individual authors. Rather, they are sincere commentary about our agricultural professions; our data gathering and research institutions and those who administer them; and, perhaps most important, the priorities of our society. These priorities are reflected in appropriations for different kinds of socioeconomic research and data gathering. Our society gives a great deal of attention to the economics of farm product markets. Much more limited are appropriations and allocations for data gathering and research analysis focused on: (1) the economics of factors of farm production (land, labor or employment, and capital), (2) the economics of public infrastructure such as roads, and (3) the social conditions of rural people, farm and, especially, nonfarm. In turn, information that our colleagues can draw upon when preparing for conferences such as this one is limited about important relationships, such as the potential effects of closing roads.

I am especially impressed with our inadequate attention to factor markets. The U.S. land-grant/USDA complex does not give much attention to the markets for factors of production—land, labor, and capital goods—and the credit used to acquire these factors of production. We do not spend sufficient money for generating information about the transactions in these markets; learning about the relationships, volume, and price of these transactions; and estimating the cause and effect relationships. Our poor knowledge base about factor markets and the relationships fundamental to these markets contrasts sharply with our knowledge and understanding of farm product markets. We know more about the demands, supplies, and prices for sows and bulls than we know about job opportunities for our children. Compare, for example, the attention that the USDA and your universities give to prices and production for wheat, corn, and hogs with the attention given to farm and nonfarm employment opportunities, cost of acquiring technical skills, costs associated with changing employment, land prices, and machinery salvage values.

Effective identification and understanding of the relationships of nonfarm employment, physical infrastructure, and social infrastructure to agricultural development requires a much better knowledge of factors and their markets. An understanding of these relationships is also important in anticipating conditions for farming, for example, where farming might be ten years from now. Thus these papers would have been more helpful had they delineated relationships more precisely. The deficiencies of the papers, however, reflect the lack of interest our society has had in these relationships and, in turn, the inadequacy of the funds our society has allocated to generation of the relevant information and estimation of the key relationships. Nonetheless, we must not let these funding limitations divert us from diligence in identifying critical relationships and measuring them whenever possible.

Variables That Once Changed Slowly Fluctuate Often

Economic instability, of interest to economists for many years, has been of equal interest to business people and farmers. In fact, many government policies and related institutions are designed to enhance stability of economic activity. We have always known that our individual economic well being is the outcome of a complex set of interrelationships. Many of the developments getting attention today have been important in the past. For example, interest

rates, exchange rates, government budgets, and growth of money are important to any society at any time. The difference, however, is that variables that once changed slowly have recently changed dramatically. And, to a significant extent, U.S. farming as a sector, as well as some individuals within the sector and within those sectors related to farming, has become financially vulnerable to the new volatility. Farmers and individuals in related sectors conducted their financial affairs as if changes in exports, commodity prices, and land prices would continue to be favorable to producers and landowners. The possibilities of shrinking exports, declining commodity prices, and withering land prices—all potential elements of volatility—were not sufficiently considered.

Our present bewilderment about economic volatility is conditioned by two key developments. First we did not fully understand the degree to which farming and the related input and product distribution activities were geared to international export markets. Nor did we fully understand the forces accounting for the export markets. Farmers and agribusiness found it pleasant to accommodate the boom aspects of this development. Further, we tended to glory in the notion that the growth in exports was largely the result of our research, technology, hard work, and Yankee ingenuity. We didn't realize that it was also staked on the cards of exchange rates, recycled oil revenues, and population and income growth in faraway places. The more our agricultural sector became dependent on exports, the more vulnerable the sector became to possible adversity associated with changes in these international and monetary variables.

Second, the concern for increased military power and the desire for lower taxes were so great that their proponents were willing to risk large federal budget deficits. The large budget deficits in combination with a monetary policy to restrain inflation of the general price level led to dramatic increases in real interest rates and increases in the value of the dollar. U.S. exports became less competitive and U.S. farm exports were adversely affected. Thus farmers and those associated with them now are experiencing the adverse aspects of volatility in export markets and financial conditions. Further, the budget deficit is so large and the supply-demand balance of U.S. farm production so ample that we cannot imagine the current bearish commodity situation changing soon. Nor can we think that real interest rates will drop sufficiently to permit substantial and near-term relief to farm debtors. Our present bewilderment about volatility, therefore, is heavily laden with pessimism about farm export prospects and lower real interest rates.

The comparative advantage in U.S. farming depends on many conditions, some farm and some nonfarm, some domestic, and some foreign and international. In addition, the nonfarm conditions are so important that U.S. agriculture can lose its comparative advantage in the world without any change in our farm resources, farmers, or technology. A relatively simple but profound lesson of beginning economics—the one about guns and butter—is relevant here. Resources used to produce guns are not available to produce butter and vice versa. This lesson is not well understood; or, if understood, often ignored. It is a lesson that helps us understand the fragile nature of U.S. comparative advantage in agriculture. It also helps us realize how farming depends on nonfarm conditions, as well as the farm production technology we usually think of as important to the competitiveness of U.S. agriculture.

Some people were amused recently when a famous cartoonist suggested that we were making swords out of our plows. We are doing just that. The reality is sobering, not amusing. Missiles require metals, labor, and capital. If these

resources are used for missiles, they cannot be used in farming and the industries serving rural America. We let the "markets" bring about the reallocations but the outcomes are as certain as if a U.S. politburo did the allocating.

The current budget deficit associated with our defense expenditures requires restraints on government expenditures for farm programs, education, research, roads, bridges, and social services. It also requires large federal government borrowings since we are unwilling to tax ourselves to pay for all of our defense and other services. Since we are not willing to save enough to meet the government borrowings, savings of foreigners must be attracted. As a result, the value of the dollar has risen and high real interest rates have developed.

Farm export sales are depressed because the high value of the dollar over other currencies causes high prices to foreign consumers for U.S. farm products. The associated high real interest rates have consequent effects on the interest expense of variable interest rate loans throughout our economy and on the cost of buying new "plows" as well. We should not be surprised to hear that corporations that make "plows" are experiencing decreased sales and are re-orienting their manufacturing facilities for defense equipment. The "plows" are needed as "swords." The market system brings about the reallocation, with consequences and outcomes as certain as if the defense buildup were accomplished by fiat that commanded, "Make swords out of your plows!"

The notion that nonfarm variables have had an increased and perhaps volatile effect on our export prospects (comparative advantage) has tremendous implications for our research and educational institutions. We now know that these nonfarm variables have great effects on the welfare of the agricultural sector (farming and nonfarm). The need to understand these conditions is an obvious priority. Our institutions must assist in identifying the policy alternatives, anticipating accurately the effects of the alternative policy choices, and ensuring that the public also understands these effects. We simply cannot expect wise public choices in these kinds of matters without an informed rural populace. This is a tremendous educational challenge. Rural people, particularly farmers, will find great financial advantage from this kind of information.

Limited budgets may mean that we cannot both maintain production research and amass sufficient resources to realize this educational challenge. If this is the case, I would argue that cutbacks on production research should be tolerated, important as such research is. To do otherwise is unfair to those we claim as our clientele—farmers and others in rural America.

Changes in Prices of Land, Labor, and Capital Have Been Unequal

The volatility of conditions in the past five years has generated important changes in factor prices, which in turn are important seeds for changes in farming methods, employment on farms and in rural communities, and perhaps, the organization, size, and location of our rural communities.

The transformation of U.S. farming for many years was characterized by the following:

1. A sharp, long-term decline in the use of labor;
2. Relative stability in the amount of land farmed by all farmers;
3. Expanded use of water;
4. A large increase in the use of capital goods, involving new technologies such as chemicals and machinery;
5. Increased specialization by individual producers;

6. Movement toward a bimodal distribution of farms, with relatively few farmers providing the major portion of production; and
7. A large increase of farmer-operator held debt to finance capital inputs and real estate purchases.

These changes extended over many years and reflected levels and changes of factor prices that encouraged the substitution of capital goods for labor, and support of commodity prices followed by bullish export conditions that stimulated specialization of production and expansion by many farm operations based on credit, as opposed to internal savings.

Relative increases in prices paid for labor (wages) exceeded price changes in other categories of farm inputs during the 1940s, 1950s, and 1960s. For example, the price of labor went up 229 percent during the 1940s. In contrast, land prices increased 103 percent. Fertilizer prices increased less than 50 percent. The relative increases in prices paid for labor exceeded changes in other categories of inputs during the 1950s and 1960s as well.

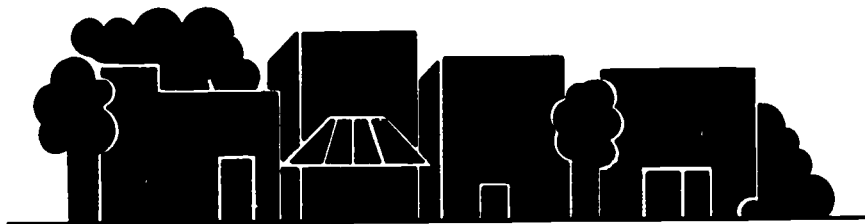
Conditions changed in the 1970s and in recent years. In the 1970s, the price increases for fertilizer and land exceeded the relative wage increases, lessening the incentive to substitute capital for labor. In recent years, wage changes have been much more restrained than in earlier years. The recent drop in land prices, the debt crisis experienced by those with high debt asset positions, the uncertainty about product price recovery, and the high real interest rates represent a set of incentives that sharply contrast with those confronting producers in the 1960s and even the 1970s. Increases in the real interest rate to nearly 8 percent also stand in sharp contrast to conditions in earlier years.

The combination of factor price relationships and product price uncertainty and their likely volatility are incentives to many operators and their bankers to: (1) curb desires to expand, especially through land purchases financed with borrowed money; (2) rely more heavily on internal family savings for operating expenses, for expansion of capital inputs, and for land purchases; (3) diversify production activities in order to spread price risks among several enterprises and to utilize available labor more fully throughout the year; and (4) look closely at possibilities for substituting labor and perhaps land (if internal savings are available) for capital goods.

This set of developments has implications for how we organize our communities, as well as our farms. For example, the financial implications for community educational, sanitary, and water facilities are strikingly different under today's conditions of 8 percent real interest rates, declining farmland values, and limited nonfarm rural employment opportunities, than they were in many communities in the 1970s.

Summary

Uncertainties surround conditions in farming and in rural America. The ramifications of these conditions for employment, infrastructure, and community institutions are obscure. The related uncertainties and obscurities, however, attest to the importance of giving more analytical attention to: (1) relationships that pervade the economics of farming and our society, (2) the volatility of variables that were once stable, (3) non-farm, as well as farm, conditions now eroding U.S. comparative advantage in agriculture, and (4) the infrastructures and the institutions that are all critical parts of our rural societies. The understanding of the associated interdependencies, including the cause and effect relationships, is important to wise choices among local, regional, national, and international policy alternatives.



Session IV: Implications and Policy Recommendations for Rural Areas

Chapter 11

Community Capacity Building to Take Advantage of Opportunities for Agricultural and Rural Development

Cornelia Butler Flora and David L. Darling

The macro economic forces assailing rural communities, particularly agricultural communities, seem impossible to combat. The determinism implicit in high interest rates, declining land values, low commodity prices, a strong U.S. dollar, high federal deficits, and increasing financial exposure of both U.S. farmers and those developing countries that provided the bulk of our increased export markets in the 1970s seems devastating. The migration turnaround between 1970 and 1980 depended in part on a strong rural economy. Are agriculturally-based midwestern communities doomed? Must they wait for the macro trends affecting them to be altered before self-help makes sense? Or is there something that can be done immediately by communities both to create opportunities for agriculture and rural development and to recognize and take advantage of those opportunities when they appear?

This paper will discuss ways to build greater capacity for economic development into rural communities. Two specific questions will be addressed: what needs to be done for locally-generated economic development in agricultural communities, and who bears the responsibility for carrying out the activities necessary to foster and support such change. The setting for this new community development initiative is the agriculturally-based, rural community isolated from markets, limited by shortages of labor, capital, and management training. In order to determine what needs to be done and who will do it in that setting, the process of economic development must be understood as well as the ends or goals it is supposed to achieve.

The Process of Community Development

Communities often define their problems in terms that imply economic development. They say "We need more jobs." Those jobs are seen as the basis for maintaining population and generating local trade. Capital accumulation and jobs are not synonymous, although capital accumulation of some sort, in terms of investment, is needed for job creation to take place. Job creation in the nonagricultural sector is a key for agricultural survival in much of the region. In the North Central region, over half of the farmer operators are employed at least 100 days a year in off-farm work. Comparable data for the employment of the spouses of farm operators is not available. However, the studies that have been carried out in various parts of the Midwest show a high and increasing level of spouse off-farm employment. This suggests high interaction between farm economy and off-farm economy. (See Figures 11.1 and 11.2.)

Figure 11.1. Hodgeman County (Kansas) Personal Income

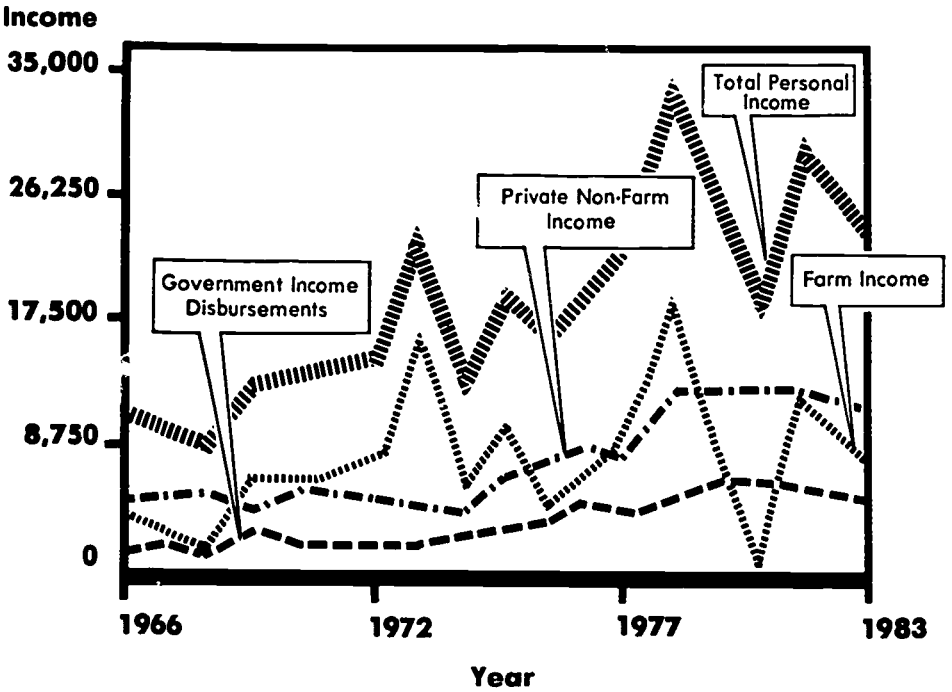
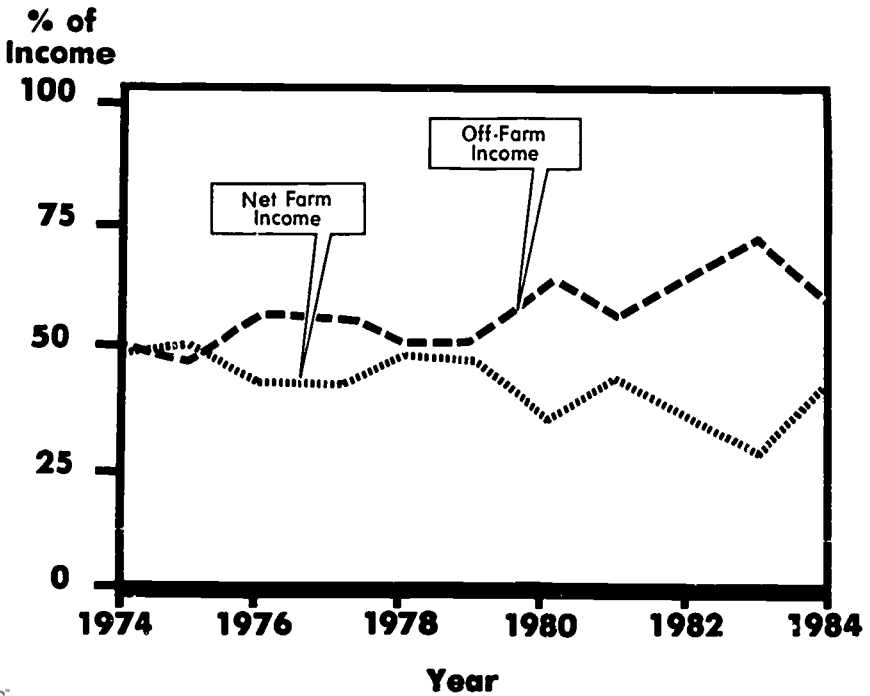


Figure 11.2. United States Farm Income



Our analysis of the farming counties of Kansas shows the strong relationship between farm income and total family income changes over time—as well as the relatively steady trend in labor income, which can offset the ebbs and flows of agricultural prices. The two-way dependence between farm and community means that planned development in these counties must take into account the limits and opportunities associated with agricultural production, including possibilities of processing the crops produced, of diversifying the crops produced with accompanying processing and marketing capacity, and the seasonality of labor availability.

In the past, communities have invested heavily in attracting manufacturing firms, to the exclusion of other avenues of job creation and capital accumulation. While such recruitment, when successful, can generate jobs, these jobs are often relatively low paying, with high labor turnover, as well as factory turnover. This occurs at the cost of high community investment through building infrastructure, foregoing tax revenue, and increasing demands on community services (Summers et al., 1976). Community solidarity declines and the nature of such required services as law enforcement changes, as the transitory nature of the jobs leads to high gross migrations and decline in the informal social control mechanisms of the rural communities (Flora and Flora 1978).

Community developers acknowledge that economic development is the most difficult area for community organizing (Kahn 1982). It is far easier to bring a community together to clean up the streets or build a park or to mobilize factions within a community to protest the absence of public services than it is to create income generating opportunities. (Of course, such solidarity-building activities may be important precursors to the more difficult economic action.)

The past approach has been to a large degree a combination of internal attempts to improve the quality of life and community economic viability through attempts to recruit outside industry. The pitfalls inherent in building such external dependencies are many. We hope to present an alternative to industrial recruitment. This alternative attempts to be locally controlled and participatory, based on local resources combined when necessary with outside capital. We will present a schema for community capability-building for economic development that can facilitate agricultural development and rural development. Such capacity-building is based on community organization that brings together public and private groups to identify, analyze, and attempt to change key constraints to their community's rural development. Economic development is not the goal—but it is the key to the real goal of rural development. For activities to be successful and not escape from the control of the community, those substantive goals of quality of life, including but not exclusive to economic viability, must be clearly defined from the onset and made explicit, so that they can be constantly referred to as a measure against which to gauge results.

For many that choose to stay in rural communities, as well as for most who return there to live, the motivation is more a way of life than a way of living. That way of life revolves around agriculture and the values that United States and Canadian citizens, more than any other people, have associated with it. These values include hard work, combining manual and mental work—conception with execution, familiness, property accumulation, and sense of community. While these values are not exclusive to agriculture, family farming, as it has

evolved in the Midwest (Pfeffer 1983), perhaps best exemplifies them. Thus development efforts that would destroy the conditions allowing that way of life to continue may be possible but not desirable.

The Content of Development in Agricultural Communities

Community residents commonly generate development goals in five general areas: growth, development (defined as the formation of new capacities to get old jobs done in new ways and new jobs done previously never undertaken), stability, freedom, and justice. Examples of such goals, which may be mutually contradictory, show the specificity possible and the implicit value structures present. Further analysis of them implies the importance of local control to maintain economic well-being.

Growth Goals

1. More employment opportunities, especially as farm families have increased financial exposure and decreased equity to defend that exposure. Employment, however, is sometimes stressed over income generation, limiting from the beginning the alternatives a community might consider.
2. Higher per capita or family income. In rural communities with a large, non dairy farm base, this may also be expressed in terms of equalizing the cash flow throughout the year.
3. Expanded number and types of businesses and industry. Communities that have been single-industry towns are particularly aware of the perils of lack of diversity in their economy, although there are always segments in such communities who simply want to replace the departed industry with a new one, retaining their dependency with a different patron.
4. Larger tax base. Even though in many midwestern communities farmland was not revalued for tax purposes as property values increased, the small profit margin in farming supports a low tax ideology and the feeling that industry and urbanites, not farmers, should bear a larger share of the tax burden.

Development Goals

1. Developing new economic and community institutions such as credit unions. As rural banks are particularly hard hit during the current farm crisis, many local financial institutions are in danger of going under or being bought out, often to be closed down. The battering that farmers are facing after five years of poor crop prices and heavy losses, combined with a 25 to 30 percent plunge in farmland prices making their collateral no longer adequate, is mirrored, according to the *Wall Street Journal* of December 31, 1984 in the 4,300 banks, most in rural communities, with heavy and potentially delinquent farm loans. Local specialized financial institutions may make the difference between maintenance or decline in many communities, just as our research has found the progressiveness of the local banker meant the difference between maintenance or decline in rural communities in the 1960s and 1970s.
2. Improving the economic efficiency of local resource use such as higher and better use of land and buildings, both on and off the farm. Diversification and fulfilling the needs of local markets through innovative land and structure use could aid in achieving this goal.

3. Changing the population size and composition of the community. Rural communities are now demonstrating deep concern for the plight of young farmers, who had to raise the capital for farming at the conjuncture of high interest rates, low inflation, and low farm prices. The specter of an even more aged farm population, unable to retire because there is no one who can afford to farm their land on a cash rent basis and no one with the capital to buy it, is very real in many rural communities.

Stability Goals

1. Stabilizing the outmigration of young adults. Agriculture, because of the increase in the factor price of credit, is particularly difficult for young people to enter at this point in history. Although the social setting of rural communities may be unacceptable for some young people at this stage of their life cycle, creative ways to enter farming must be established for those ready to do so.
2. Increasing the proportion of local income spent locally. Input-output analyses can identify areas where local capital can be recirculated.
3. Increasing the proportion of local income invested locally.
4. Insulating the local economy from big seasonal and business cycle swings.
5. Decreasing absentee ownership of businesses and real estate. The current round of farm foreclosures, even more than the period of speculative investment in land during the 1970s, has made farm-based communities aware of the implications of separation of management from ownership in family-based farming systems.

Freedom and Justice Goals

1. Expanding opportunities for young and low-income workers. Implicit in this goal in many rural areas is an emphasis on "being your own boss" and development of owner-run enterprises.
2. Freeing the rural community from employment, credit, and investment discrimination. This may become particularly important as deregulation of banking makes it more difficult to attract funds.
3. Providing all citizens an opportunity to become involved and have a say in the community's future.

These goals combined indicate grass root values of control and self-determination with economic dignity. What must be done for such economic development to take place? What are the factors affecting community development and how can communities use them in their favor?

What Work Must Be Done?

What is the process of economic community development? What strategies are effective in bringing about desired changes? Using the Social Action Process, plans should be made and action strategies should be drafted. A town meeting, such as described in the "Steps to a Successful Town Meeting," published by Kansas State University Extension Service, could also be used as part of the Social Action Process. Five major factors should be considered when planning community development aimed at stimulating economic growth.

Factors Affecting Community Development

Edwards (1976) identifies five factors that can help bring about economic development.

First, an economy can develop faster when the amount of resources made available is increased and put to work productively. Investment capital, for example, is one resource often lacking in small rural communities. This can be the result of a lack of attractive investment opportunities or a lack of investment money being generated locally. Federal and state governments have a variety of programs to provide loans and grants to public and private entities, although these are likely to be terminated soon. Furthermore, local private venture capital organizations can be formed. The new 503 Certified Development Corporation can help firms finance fixed capital investments over a long period. Despite these potential sources of outside capital from public sources, the current political climate suggests the need to generate local private capital sources to replace revenue sharing, small business loans, and the like.

The retirees living in a community may be a hidden source of capital (Summers and Hirschl 1983) if local organization make it possible to invest it productively. A number of communities have organized local investment firms. These can be sources of venture capital for well-planned, locally generated private production and service initiatives.

Next, an economy can develop faster when the level of technology used in producing goods and services can be advanced, resulting in a more efficient use of local resources. For example, when hybrid corn varieties combined with chemical fertilizer, insecticides, and herbicides were developed and then adopted by farmers, corn yields rose dramatically, as did the profits of the chemical companies that produced the inputs. The package approach to agriculture was adopted by the chemical companies, who then proceeded to acquire the seed companies that produced the hybrid seed. The control of the innovation was removed from the local community, and the efficiencies of increased productivity, while reflected in higher yields per acre, were absorbed by the multinational marketers of the inputs. The real price of a bushel of corn actually decreased after the introduction of the technological innovation. Further, farmers who produced self-pollinating corn found they no longer had a market. There was no way to remain in farming and not adopt the innovation. The innovation contributed to community growth as input dealers sprang up, handling the money spent at least once before it left the community. Yet the full benefit of technology improvement did not remain in rural communities.

Communities concerned with agriculture must seek out technology that allows them to compete in terms of production, but also allows for recycling of dollars generated within the community. Such technology may be a new way to bale hay or a new way to manufacture roller bearings. The important factor is that the technological breakthrough gives local industry a new market advantage over other competing industries located in other regions, which results in an expanded income source for the local economy. In particular, a new technology that utilizes local products has high potential for community economic development. The extraction of chemicals from milkweed is an example of such an innovation with economic potential (Adams 1983).

A third way an economy can develop faster is discovery of new or expanded markets for goods and services produced locally. In a corn producing area, the establishment of corn sweetener manufacturing plants has meant a new market for that crop. The corn gluten extracted from the process has meant a new export overseas, because corn in that form is exempt from the tight tariff restrictions of the European Common Market. The local price increase for a major commodity stimulates a chain reaction of economic activity. Producers realize a higher return, which provides capital to reinvest in machinery, buildings, and tools. These purchases provide more business for others in the area.

A final example is the cattle-sorghum-wheat-corn farming system in western Kansas. Some communities began feeding cattle wheat when the price was low, cutting their feed costs by not having to add protein to the feed mix, because wheat has a higher protein content than corn. And, by buying an input locally rather than importing it, more money is circulated within the community, which ultimately can be made available to farmers in the form of production loans. A technological innovation that is locally controlled can result in an expanded local economy.

An economy can also develop faster when the costs of conquering space diminish at a relatively faster pace than costs are decreasing in other regions. An example of the cost of conquering space is transport costs of goods to market. The advent of telemarketing allows a rationalization of transportation of small lots previously available only to large shippers. A new highway through a region may lower the trucking cost for local industries enough to either increase their market share of traditional markets or allow penetration of new markets in other regions of the country. Thus, decreasing the cost of doing business over wide geographic areas can lead to more sales of locally produced goods. These kinds of space-conquering technologies can require sophisticated social and political organization beyond the reach of a rural midwestern community. Training in access to such technologies from the outside may be crucial. Another way to conquer space is to substitute items produced locally or nearby for those produced far away. In some areas, the introduction of greenhouses and truck gardens has allowed substantial substitution of locally produced produce for imported produce. Such produce substitution, requiring complicated guarantees to wholesalers and retailers, is difficult to introduce without substantial organization and business acumen behind it.

Finally, an economy can develop faster when efforts are made to build institutions to facilitate a more efficient or more socially desirable use of resources. The public school system is an example of an institution that has made it possible for every child to have access to an education. This has resulted in a much more productive labor force, because people have the basic understanding and skills necessary to be technically trained for specific jobs. Another important institution is the stock exchange. The stock exchange make it possible for firms to raise capital by selling interests in their corporation to anyone with investable cash who wishes to take the risk. Through this institution, capital in the hands of a Texas investor can flow to a corporation that is developing lignite mines in North Dakota. Thus, capital can be much more productive because of the existence of the stock exchange, and people can be much more productive because of the education received in public schools.

These institutional innovations are also complex and seem beyond the means of a rural community. Further, they can work against the maintenance and growth of rural communities. Public schooling can convince educated young people that they have no future in rural areas. And the stock exchange, along with changes in the banking system that accompany bank deregulation, can channel capital from agriculture to areas of the economy where there is higher and quicker return to investment. Indeed, the development of institutions that increase the mobility of capital means that only through actions of the public sector, such as investment tax credit and special write-offs for farming, can investment by certain individuals interested either in speculative property or in tax advantages of various kinds be encouraged.

However, there are local institutional arrangements that communities can attempt that replicate these efforts and contain them within the community. In terms of education, most rural residents recognize the vast variety of skills necessary to be successful in farming. These skills include mechanics, management, and bookkeeping, among others. Yet these skills are not being directly transferred by farmers to off-farm activities that could diversify their income generating opportunities and add to community growth. Establishment of a skill-adapting clinic for farmers interested in local off-farm alternatives could prove to be a local institutional innovation key in rural development. Further, pooling of local capital to provide some of the services now purchased from outside the community might be an institutional way of both generating capital and recycling dollars in a community. Several communities too small to support an undertaker have formed burial societies that provide dignified and inexpensive funeral and burials for members—keeping the capital at home. Another community is considering creating a community fire insurance group, keeping the capital now leaving the community at home for local use. Such institutional innovations have to be carefully calculated, however, and should involve relatively little risk. For the sake of community solidarity, the introduction of such institutional innovations works best when there is no local representative of the service being substituted for.

All five factors need to be present to facilitate the economic development process. However, just one factor alone can be the catalyst for the process. When a community is building capacity to influence these five factors locally, careful cost-benefit analysis of alternatives should be carried out and submitted to the community for consideration and discussion. In particular, the potential impact of actions on noneconomic aspects of rural development need to be made explicit. For example, the creation of a local institution for recycling farm family skills may serve to keep the value of hard work and self-sufficiency, while the decision to attract a low wage industry may have the opposite effect.

Capacity building for agriculture and rural development must have built in the diversity to seek many strategies for local capital accumulation. It is logical that manufacturing and service firms be part of that strategy. As in the case of the factors of economic development discussed above, rural communities interested in quality of life should be encouraged to retain, expand, and create local firms with local capital as a base, as opposed to launching mighty efforts to attract outside industries to locate in rural areas. Such location happens less and less often in the North Central region, and even when it does happen, the impact on the community is often mixed at best.

Who Will Do the Work?

The kind of economic development we are discussing involves the coming together of private entrepreneurs, local capital, and community organization. If such activity were totally market-responsive, it would have probably already emerged. What is needed is a systematic way to identify actions, ideas, and capital in order to carry out the economic activity necessary for community maintenance.

The following generalities are not absolute facts but have been found to be most often true by the authors.

- Nothing dramatic ever gets done in small population centers in the U.S. without the help of volunteers from within the community.
- The smaller the city is, the more important volunteers are in the process of community change.
- Linkages to outside resources are important in accomplishing community projects.
- The smaller the city is, the more involved the reliable volunteers are, to a point of being overcommitted.
- Elected and appointed officials devote a large majority of their time and budget to maintenance functions of city and county governments and on crisis management.
- Long-range and profound development projects are not usually found on the agendas of small city councils.
- Good community leaders are trained by experience and by instruction: they are not innately endowed.
- Among the scarcest resources in rural areas are individuals who can provide good leadership and are willing to take on leadership responsibilities.
- The other scarce resource in rural areas is individuals who can find, process, and put into usable form information useful for community development decision making.
- The Social Action Process, as a means of bringing about community development, works well when used by community groups in relatively homogeneous midwestern communities.

In summary, if you accept these 10 generalities, then this logically leads to the following conclusions: Profound community development in small agriculturally-based communities will most likely occur when good volunteer leaders are identified and given leadership roles. Then these leaders need to be provided with usable information and a willing volunteer committee. The community group actions will succeed by following the community action process. Such a community group pursuing long-range planning and implementation activities must bring together outside and inside resources to solve community problems. Local government officials must cooperate as should other community groups.

Staffing the Rural Development Process

Rural change occurs spontaneously. Rural development is planned. Capacity for rural development is created within the community, within an organizational structure. As in many other areas, community developers in Kansas have

found that the creation of an umbrella organization, which usually involves the coming together of a variety of community groups, is the best basis for building community development. Often these groups have included elected officials (city commissions, for example) and voluntary associations, such as the Chamber of Commerce, the Lions Club, Rotary, the Business and Professional Women's Club, etc. Building the umbrella organization is time consuming, yet it can also be a key opportunity for outside intervention to help mobilize the existing community forces. Often key organizations in value setting in the community are not included because they are not viewed as civic organizations. However, their inclusion can be crucial for the success of the project. These organizations include the churches, of which many denominations are demonstrating an increasing concern for the welfare of farmers and their communities and farm groups. Since many farmers do not live in town, their input through such entities as the Farm Bureau, the Farmers' Union, and the National Farmers' Organization, is not always sought. Yet they must be a key element if agricultural and rural development are to go hand in hand. The interdependence of farm and community is underscored by their inclusion. Farmers' cooperatives are important organizations to include.

Women's groups are crucial to include in the umbrella organization. Most community developers have learned to appreciate the leadership and labor that women provide in community development efforts. However, women's organizations are also key to goal setting, as the complementary gender role functions in rural communities often mean that men and women may have different goals and different constraints in meeting these goals.

The umbrella organization, representative of the community is key to creating and maintaining community capacity for rural development. Such capacity building involves both individuals and organizations in (1) identifying goals, (2) analyzing means toward those goals, (3) identifying constraints to reaching them, and (4) determining to act together to achieve the determined goals through the identified means. Once that has been done, the techniques for carrying through must be made available. It is up to the umbrella organization and its leadership to create community solidarity, establish linkages to necessary resources, and use these tools to increase the pool of resources available in the community.

Individual entrepreneurs, particularly those in the area, are vital actors in this process. According to a study conducted by the Chamber of Commerce of the United States, approximately 82 percent of the economic growth of an average American community results from the creation and expansion of locally owned and operated enterprises. Birch (1979) found in Massachusetts that about half of all the new jobs created between 1969 and 1976 were created by independent businesses (single establishments), while the remainder were created by multi-establishment corporations. Agriculturally dependent counties, in particular, should be aware of their agricultural base and seek to complement it as they seek economic maintenance and expansion. Such activities, to be successful, link entrepreneurs, organizations, and the agricultural base. Locally controlled small industries can be more responsive and more flexible than multi-national corporations in responding to shifts in the agricultural marketing setting. For example, Krause Plow Corporation, a farm equipment maker in Hutchinson, Kansas, took costly steps during the recent recession to improve

its tillage equipment line. More engineers were hired, despite cutbacks in the production work force. The result was an upgraded line of tillage tools, responsive to the shifts to minimum tillage farming and the need to better tailor equipment to soil types.

The economic flexibility of small locally owned and operated plants is also exemplified by the Landoll Corporation of Marysville, Kansas, as reported in the *Wall Street Journal* of December 21, 1984. The company also manufactures farm equipment, including implements and trailers. In 1981 and 1982, in response to a drastic decline in sales of its farm equipment transporting trailer, the company hired extra engineers and shifted sales efforts to a new market. The trailers were redesigned and marketed to haul wrecked vehicles and to handle baggage and freight at airports.

In these cases, local firms raised capital internally to make the modifications necessary to expand production at a time of general recession. Local ideas and entrepreneurship are absolutely necessary.

In terms of "who" acts then, local entrepreneurs are a major part of the locally based economic equation. Their flexibility and local sensitivity make them particularly effective actors in local economic development efforts.

The Texas Electric Service Company (1970) listed a number of reasons economic development efforts should begin with the existing firms in a community.

1. Many of the local firms grew out of local advantages or needs. In the case of agricultural communities, such industries will probably build on the area's agricultural base or be responsive to its patterns and cycles of each availability.
2. Existing firms have proven their adaptability to local conditions. This is particularly important in rural areas, which generally have more to offer than a low wage labor force.
3. An industrial development effort frequently will get quicker results by dealing with local firms than it would by negotiating with outside interests.

Some of the problems and concerns of local firms are out of the control of a community. The community can do very little to influence national business trends, consumer attitudes, tariff barriers, investment tax credits, direct subsidies, and special fiscal concessions. There are, however, a number of things a community can influence: (1) sites or buildings suitable for expansion; (2) financial services; (3) locating suitable employees; (4) locating capable subcontractors; (5) securing engineering or research for improved or new products; (6) arranging for improved transportation, utilities, and safety services; (7) civic action on housing, education, recreation, and government relations; and (8) vocational training programs.

Such actions require the support of large segments of the community. The umbrella organization must be mobilized and trained to carry out such activities. Long term commitment to a diversified economic base that links farm and community through locally based firms must be constantly renewed through the umbrella community development organization and the contributing local organizations. Such support does not mean unquestioning acceptance of any and all actions a local firm may attempt. But it does assume a basic attitude of collaboration rather than confrontation, and action rather than apathy.

If community economic development is to be established and maintained, the umbrella organization must develop a strategy for training professional enterprise organizers. These positions should evolve into paid positions, using tax revenue or special levies as needed. Because of burnout and the limited time commitment of the traditional community leaders, professionalization of the position is particularly important. Specific business and management skills must be taught.

Women in the community are often an untapped reservoir of professional potential. Often highly trained outside rural communities, some skill upgrading could lead to development of a cadre of women who can benefit the community—and themselves and their families—economically by building community enterprises. Such preparation should be viewed as continuous, as experience in other settings suggests that such women often establish their own enterprise in the community after working a few years with the umbrella organization (Flora et al. 1985).

Community action to retain, expand, and create local firms includes five steps. These are iterative, with periodic updating and reconsideration required.

First, a community inventory including existing firms; possible sites; infrastructure, such as water, sewer, and access roads; existing and potential labor supplies; housing; utilities; transportation; and taxes, should be made. The inventory can be used in working with existing firms as well as in creating new ones. Small firms are particularly important to include. Birch (1979) suggests that small firms are often the biggest job generators in small communities. Home-based businesses run by women, including childcare, retail sales, crafts, and services should be included.

The next step is to establish a visitation and follow-up committee. This small team should interview each local firm to determine problems or concerns of the firm and plans or potential of the firm for expansion. Every effort should be taken to follow up on the firms' concerns and inform them of those efforts. These services are confidential and provided without cost to the firm.

The third step is to develop a plan of action. This should include site, infrastructure, credit, vocational training and retraining, and establishment of a labor/management organization. Additional attention should be given to help market and provide the necessary inputs for small industries, including agriculturally based ones. Marketing is often a far greater problem for small businesses, whether farm or nonfarm, than is production. Cooperative marketing arrangements made directly to buyers may be a major community organizing activity.

Then the economic development team must meet regularly with the firms' officials, maintaining contact in order to facilitate the linkages within and outside the community. This is particularly important for small enterprises with relatively little experience, as the problems in setting up a firm are often quite different from the problems involved in day-to-day operations.

Fifth, it is important to remain flexible and responsive. In most instances, money is less important than developing good plans for the use of money. Retaining existing firms and helping them expand is at least as important to a successful economic development strategy as is the search for new enterprises to move into a community. Small firms create most of the nation's new jobs, and they often are in the greatest need of assistance. Yet knowledge about how best to help small firms start up and expand is scarce.

In order to carry out these steps, from community mobilization, knowledge building, and action, many skills are needed in the community. Skills of use to small firms, from community needs assessments (often based on an import-export model) to accounting and management practices, need to be taught. The developing professional cadre of local community workers can find this training their first reward for community service. Awareness of private and public resources to aid small firms needs to increase. In short, motivated community leaders must take on a rigorous period of training and linkage to specialists in specific aspects of economic growth and local financial viability if a self-help model based on local, rather than imported, income generation is to be successful. The professionalization of this activity, moving it to the prestige associated with paid professional equipment, helps develop commitment and continuity. The public sector, particularly educational institutions and cooperative extension, needs to participate actively in such capacity building to augment and complement the private sector. The development of local talent can be much cheaper in the long run than being dependent on outside consultants.

The tri-partite nature of locally based community economic development includes (1) an umbrella community organization, (2) local entrepreneurial talent, and (3) local professional training and resource mobilization. This complex mix of diffuse community well-being goals with specific individual profit is a key factor in the continuation of a productive and socially desirable symbiosis of community and agriculture in the Midwest.

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Chapter 12

New Policies to Take Advantage of Opportunities for Agricultural and Rural Development

Luther Tweeten

The migration turnaround apparent in the higher rates of growth of employment and population seen in rural counties in the 1970s has turned around again in the 1980s.¹ From 1980 to 1982 metropolitan population grew 2.4 percent, while nonmetropolitan population grew 1.9 percent (U.S. Bureau of the Census 1984, p.2). From 1979 to 1982 employment declined by 1 percent in nonmetropolitan counties and increased by 1.1 percent in metropolitan counties (Daberkow and Bluestone 1984, p.7).

The turnaround in the 1970s distracted attention from persistent rural problems of poverty and underemployment and stalled major federal initiatives to deal with these problems. Perhaps changes in the 1980s will revive interest in the economic problems of rural areas. Although diverse, rural problems frequently are cut from the same cloth as urban problems and often will be alleviated only by nationwide programs for rural and urban areas alike.

The purpose of this paper is to review rural opportunities and problems and suggest an appropriate federal response. Following an analysis of the economic justification underlying programs for agriculture and rural communities, specific policies are discussed.

Rationale for Development Policies for Agriculture and Rural Communities

Agriculture and rural development policies must be viewed within the context of nationwide policies to improve the well-being of people. Fundamentally, that implies greater equity and efficiency in resource and product allocation. The emphasis is on programs for rural people; however, if rural gains are more than offset by urban losses, the programs fail the economic—if not the political—acceptability test for implementation.

The United States relies heavily on market price signals for allocating resources and products. The market performs rather well in allocating resources to uses providing the greatest private incentives. Yet private market incentives frequently differ from social incentives. A public role is justified in such instances of divergence of private from social costs (benefits)—provided that public interventions do not entail greater costs than the distortions they were designed to correct.

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¹The term "rural" as used in this paper generally refers to nonmetropolitan counties but can also include people living in open country and cities of fewer than 50,000 residents within metropolitan counties—a concept defined as "micropolitan" by Tweeten and Brinkman (1976).

In recent years there has been growing realization that government failure has been as pervasive as market failure. Hence this paper analyzes public policy changes to correct both market and public policy failure.

Problems

From the preceding background, the major economic problems of agriculture and rural areas that are appropriate candidates for redress through public policies can be examined.

Macroeconomic Policies and High Real Interest Rates

Business cycles are endemic to all advanced free enterprise economies. A major role of government is to use monetary and fiscal policy to dampen the business cycle and promote steady, sustainable economic growth without undue inflation. Instead, U.S. macroeconomic policies of the past decade have become a major source of income instability and resource misallocation, causing financial stress to agriculture and other rural industries.

The principal problem is high real interest rates caused by seemingly uncontrollable federal structural (full-employment) budget deficits. Such rates are hardships enough in themselves but also cause serious problems through foreign linkages. High real interest rates attract dollar investments from abroad, raising the foreign demand for dollars relative to supply and driving up the value of the dollar in international exchange. This makes imports cheap and exports dear. Low-cost imports compete effectively with domestically produced goods, causing extensive labor layoffs, company failures, and general economic hardship for such industries as textiles and mining that are especially important to rural areas. Since World War II, many industries have moved from urban to rural areas to reduce labor costs and remain competitive with imports from developing countries. However, the high dollar in the 1980s has destroyed the comparative advantage of many of these industries.

In the case of textiles, import restrictions bring some relief to the industry, at the expense of higher consumer prices and sales of exporting industries such as agriculture. Our agricultural exports are then diminished by foreign retaliation for textile quotas and by reduced exchange earnings of nations buying our farm products. High real interest rates in the U.S. are felt keenly abroad because of efficient worldwide financial markets and loans to foreigners tied to U.S. interest rates. The resulting financial crisis causes many developing countries to further erode their purchases of U.S. farm and other exports.

Federal fiscal policy especially has damaged export industries, with agriculture a prominent example. The erosion of farm exports by the high value of the dollar has brought about costly federal programs to remove excess farm production capacity and maintain farm income. The financial crisis caused by high real interest rates has especially ravaged mid-sized family farms. Land values depressed by high interest rates and massive interest costs have caused the widespread farm failures dramatized in newspapers, television, and movies.

On the other hand, rural and urban consumers have benefited from low-cost imports. The high value of the dollar has constrained domestic inflation. Yet neither the high real interest and exchange rates nor the huge federal budget and trade deficits can be sustained. Ultimately, payments on the debt and

foreign withdrawals from capital investments in the U.S. will more than offset the consumption bonus (consumption well in excess of domestic production) now enjoyed by consumers. When the inevitable turnaround occurs, consumers will be worse off and producers better off. The instability inherent in such cycles creates traumatic real wealth adjustments and redistributions that macroeconomic policy more appropriately should dampen rather than exacerbate. Many foreign markets and domestic farmers lost in the downturn will not be retrieved in the upturn.

Externalities and Other Incentive Distortions

A host of rural problems can be classified broadly under the heading "externalities." Both public and private incentives are distorted by externalities. A few decades ago the real problems of air pollution were not understood by individuals in metropolitan areas and hence were not reflected in wage and salary demands on employers. The result was an excessive concentration of employment and people in large cities prior to 1970. In the 1970s, firms, jobs, and people moved to rural areas as the public increasingly perceived the full cost of pollution in cities and the benefits of rural amenities, and as firms were charged more nearly the full cost of operating in congested areas.

Other incentives remain distorted. Many major metropolitan firms have strong labor unions that inflate wages and will not allow employers to utilize lower wage labor by setting up nonunion branch plants in rural locations. In the case of automobiles, firms unable to relocate or otherwise restrain costs demand and receive protection from imports. This results in higher costs for automobiles for rural and urban people alike and lower foreign export earnings to purchase products of our rural industries.

Socioeconomic differences between rural and urban areas have diminished over time. Unique differences primarily relate to the spatial dimension: since people and businesses are more dispersed in rural than in urban areas, there are problems in transportation, communications, and provision of community services. Many community services have the characteristics of a public good; hence the public sector is much involved in their delivery.

Many rural services are subsidized, encouraging uneconomic sprawl by part-time farmers into the countryside. For the sake of accountability and sound decisions, it makes sense for local public entities to fund and administer public services where costs and benefits of such services are realized within their jurisdiction. Thus for the most part, funding and administration of community services such as water, electricity, waste disposal, streets and country roads, community parks, and fire and police protection are best left to town and county governments.

An exception is education and welfare services. Prior to the 1970s, migration of millions of rural people transferred massive human capital in the form of local investments in schooling from rural areas to cities. With the migration turnaround in the 1970s, the direction of needed compensation for net transfers also turned around—only to reverse again in the 1980s. However, many rural communities continued to experience out-migration not compensated by in-migration of human capital in the 1970s and 1980s. For many rural communities, economic benefits derived from education within their funding jurisdiction continue to fall well short of the local costs incurred. This seeming disincentive

to adequate local school funding does not show up in major underinvestment in education, according to several studies (Tweeten and Brinkman 1976, pp. 139-43). One reason is found in the funding formulas imposed by states; another reason is the desire of parents for a good education for their children no matter where they reside. However, a case can be made on equity grounds that local areas less wealthy than the areas receiving the benefits of local investments in schooling should bear a smaller proportion of the costs of human capital formation.

Similar reasoning applies to welfare services. Areas least able to afford the costs of providing for the poor frequently have the highest proportions of the poor. Failure to provide adequate welfare in Mississippi, for example, spills over as costs to St. Louis or Chicago as the poor migrate to area with more generous provisions for the disadvantaged. Thus, urban Illinois has a stake in the welfare programs available in rural Mississippi.

Environmental problems frequently arise from differences between private and social incentives. A farmer who has a high time discount rate (needs income now, not later) or who fails to perceive the cost to society of soil erosion or chemical pollution beyond the farm gate will not act in the long-term public interest to protect the environment.

Poverty

Other things equal, the well-being of society is increased by transferring income from high wealth/income families to low wealth/income families. If taken to extreme, the transfers can reduce well-being by slowing investment by higher wealth/income persons, which in turn slows economic growth. But most Americans subscribe to the notion that individuals with limited resources deserve at least some public help to develop their human resources through education and to achieve a "safety-net" level of living.

Public Policy

The following suggestions for public policy are not designed to replace the private market but to help it work better. The suggestions call for a redirection of public policy. The purpose is to improve the performance of markets and government in doing for individuals what they cannot do for themselves.

Macroeconomic Policy

As indicated earlier, the greatest source of economic distress in rural areas today is macroeconomic policy. The appropriate public policy is to increase the money supply at a relatively low average rate, approximately 5 percent per year, but with a higher rate in times of recession and a somewhat lower rate in times of expansion. Since such fine-tuning may be too much to ask, the next best alternative is to increase the money supply at as constant an annual rate as is technically feasible.

Fiscal policy is the most urgent current concern. Here the appropriate policy is for the federal government to incur deficits during recession and maintain a balanced or surplus budget during full employment—where "full employment" today is 7 to 8 percent unemployment. That rate needs to be reduced but the reduction cannot come through macroeconomic policy; it must come from such structural policies as the wage/earnings supplement discussed below.

Wage and Earnings Policy

Structural unemployment of perhaps 4 percent of workers properly engaged in job search and other valid delays between jobs is economically efficient and expected. But the "full employment" rate of 7 to 8 percent unemployment contains approximately 3 percentage points of unemployment resulting from economic system rigidities. Such rigidities include minimum wage laws, the inflated wages of organized labor, unwarranted reservation wages (workers demanding higher wages than they are worth to employers), and high costs of payroll taxes.²

Some of these impediments can be reduced or eliminated; others such as subjectively high reservation wages are less tractable. A national right to work law, for example, would benefit marginal workers but would reduce only slightly structural unemployment. More ambitious policy initiatives are required; consequently, a wage and/or earnings supplement is proposed to reduce costs to employers and raise earnings to workers—particularly marginal workers most likely to experience chronic unemployment. A wage supplement could be provided to employees by the federal government equal to 50 percent of the difference between what they can earn from employers and a target wage of \$5 per hour. Ideally, the minimum wage law would be terminated.³ Workers receiving a higher wage would receive greatest total income; hence workers would be encouraged to compete for the highest paying jobs. The employer would have incentives to obtain the greatest productivity possible from the worker. Thus a marginal worker only able to receive a \$1 wage per hour would receive a $.50(\$5-\$1) = \$2.00$ wage supplement per hour to bring total pay to \$3.00 per hour for an annual income of \$6,000 if employed 2,000 hours. Employers (or workers) falsifying records or in other ways abusing the system could be penalized in various ways including withdrawal of the supplement. Persons of high school or younger age would not be eligible for the supplement until completing high school or after showing proper certification that they are incapable of completing high school.

Proportions of persons self-employed are especially high in rural areas. An earnings supplement would be used for those who do not work for wages. Under the earnings supplement, the federal government would match each dollar of earnings with a dollar of supplement up to annual earnings of perhaps \$2,000, after which each additional dollar of earnings would subtract \$.50 of supplement. Thus a worker earning \$2,000 would receive a supplement of \$2,000 for a total income of \$4,000. An additional \$4,000 of earnings would eliminate the supplement but total income would still be \$6,000.

The supplement program would decrease unemployment of marginal workers, increase output in labor-intensive industries, and transfer income to those who have low earnings. The program would benefit especially rural areas characterized by low income and underemployment. Compared to current welfare programs (which would remain in force), the program would better serve the working poor and households with an able-bodied male present—characteristics found disproportionately in rural areas.

²Some of the structural employment is caused by high proportions of young and inexperienced workers in the labor force—this problem will become less in the coming decade.

³If the minimum wage is not terminated, the supplement would need to be paid to employers.

Tax Policy

The wage/earnings supplement certainly would impose a considerable burden on an already deficit federal budget. Hence, it would need to be accompanied by tax increases and reform. The current system taxes labor and subsidizes capital, encouraging undue substitution of capital for labor in an economy troubled by excess industry capacity, unemployment, and family farm failure.

Payroll taxes are regressive and it would be well to reduce the burden on workers, many of whom have lower incomes than those whom payroll taxes support. Social Security was intended to be an insurance program (Old Age, Survivors, Disability and Health Insurance), protecting those covered against the misfortune of being destitute. Instead, benefits are received whether misfortune strikes or not. Billions would be saved and used to reduce payroll taxes if benefits were taxed or income-conditioned.

My proposal would end subsidies to capital. Depreciation according to the economic value of an asset is a normal business expense properly deductible for income tax purposes. However, the investment tax credit and rapid depreciation allowance in excess of the decline in the economic value of an asset could be eliminated to reduce market distortions and raise revenue.

Some consumption goods such as housing may have good features and externality benefits that warrant exemption from taxes. Nevertheless, the exemption of interest payments on consumer loans and home mortgages (above \$60,000 mortgage value) is difficult to justify on equity grounds and makes it a candidate for termination.

For the most part, there is no reason to believe that tax-exempt bonds provide a social benefit-cost ratio higher than other investments. Interest exemptions on such bonds are used for tax purposes mainly by the super rich, making them targets for tax reform to either end or limit. The result would be higher costs of financing public infrastructure.

Elsewhere (Tweeten 1984, pp. 40, 41) it has been noted that changes in estate tax laws have virtually eliminated the federal estate tax for those who plan with a competent tax consultant. Yet it would seem that deceased persons incur the least possible sacrifice from paying taxes. Furthermore, higher taxes on estates could diminish the perception that able-bodied adult heirs are living off transfers. Higher estate taxes could make larger-than-family-sized farms available to form more family-sized farms on the death of the owner. Gifts including the current market value of in-kind payments in excess of \$2,000 per year per recipient (except for education) could be taxed to recipients as ordinary income.

Numerous other tax reform proposals to increase the well-being of the population could be proposed. One proposal would end double taxation of corporate profits. Since corporations have far higher propensities to invest than individuals, double taxation of corporate profits distorts incentives, slows investment, and retards economic growth. Corporate profit taxes now are very unevenly assessed. A useful option would be to terminate corporate profit and current capital gain taxes and require that undistributed corporate earnings, including real capital gains, be prorated to investors each year to be taxed as ordinary income at appropriate personal tax rates. Personal tax rates could be lower for individuals who leave their earnings with the firm.

The foregoing reforms alone would not provide a balanced full-employment federal budget. Major new tax sources would be required unless large cuts are made in military and other spending.

Some economists advocate higher taxes on energy to account more fully for social costs of pollution, to reduce dependence on precarious energy sources, and to save energy for the future. Higher energy costs would be harmful to many in rural areas, especially irrigation farmers and part-time small farmers who use substantial energy for commuting to work, school, and shopping.

A value-added tax could provide a major new revenue source, obtain revenue from many people who now evade paying income taxes, and interfere less with investment than would an increase in taxes on corporate earnings. A major disadvantage of a value-added tax is that it is ultimately proportional to consumption and is hence regressive. The value-added tax would be more favorable to farmers than higher property taxes would but less favorable than higher income taxes.

Rural Services

As stated above, a strong case can be made for increasing the share of public education and welfare costs funded by the federal government. The federal government is currently providing major funds for food stamps, Medicaid, AFDC, and low-income housing programs. If the wage/earnings supplement were added, federal assistance to the poor might be near levels justified on grounds of economic equity and externality. Federal and state aid to education would need to be considerably higher than it is currently to compensate for spillover of education benefits. Increased aid would be designed partly to add to total funding and partly to reduce local funding of common schools. The result would be to free some local taxes, especially property taxes, to fund other local community services such as county roads and water systems.

The case for the federal government to fund other community services with low interest loans and grants is not strong. For the most part communities are not uniformly poor; community service grants and loans target poor people very imperfectly. A high proportion of subsidies for rural water, housing, electrical, and telephone services goes to those who are not poor and encourages rural sprawl into open areas where community service costs are very high. Such assistance to rural services along with revenue sharing could be phased out. The result would be fewer part-time small farms. If rural communities wish to improve their community parks, streets, etc., they can best decide whether the additional benefits for such purposes justify the costs incurred from local taxes.

In contrast to large cities, rural communities frequently lack the scale sufficient to fund adequate planning and the organizational services required to use their resources efficiently. State extension services must continue to provide help to rural communities in planning and organizing efficient and equitable delivery of services (Nelson, Tweeten, and Doeksen 1984). These extension efforts need a sound research base.

Farm Programs

The most acute current farm problems are financial stress and excess production capacity, the latter defined as production in excess of what the market will absorb at current prices. Both problems can be traced in general to macroeconomic policies. Farmers argue that they have been severely hurt by macroeconomic policies and therefore deserve compensation through commodity programs.

Longer-term farm problems include instability of farm and food prices and quantities, the demise of the family farm, environmental degradation such as soil erosion and mining of nonrenewable aquifers for irrigation, and the poverty now afflicting 20 percent of the farm population. In view of the pressing need for federal budget stringency, general commodity programs administered as in the past cannot treat these problems at acceptable government cost. The key concept for new farm policy initiatives is targeted assistance. Large farms on the average do not need or warrant assistance because they have sufficient efficiency, net worth, and control over markets to earn an adequate income and rate of return on resources without commodity programs. Many small farms have sufficient off-farm income to deal with unstable and low income from farming alone.

The first priority is to target assistance for those in financial crisis who have demonstrated managerial capability and have a reasonable chance for survival without excessive debt write-offs. The second priority is commodity programs targeted especially to mid-sized family farms, which are most at risk of failure. Past commodity programs have not helped preserve family farms (Tweeten 1984, pp. 31-33), but if they are to be preserved, a higher proportion of benefits will need to reach them. This requires emphasis on direct payments and deemphasis of supply control and loan rates above market clearing levels. Supply is difficult to control with any kind of voluntary control program and nearly impossible to control if payments are concentrated on the farms that produce less than half of farm output. However, a modest land retirement program under long-term contracts would be used to shift land that is erosion-prone or irrigated with nonrenewable underground water supplies from crops of haying, grazing, forest, or recreational uses. Requiring each farmer receiving commodity program benefits to follow an approved conservation program would also serve environmental concerns.

The above targeting would make some headway in dealing with most major farm problems, with the notable exceptions of poverty and harmful chemicals. Farm poverty is best dealt with by the human resource development and welfare programs discussed earlier rather than with commodity programs. Use of chemicals that harm water and food supplies must be regulated.

Depressed Areas Program

Many rural development programs initiated in the past quarter century, including the Economic Development Administration, regional commissions, Farmers Home Administration business and industrial loans, and the Comprehensive Employment and Training Administration have either been terminated, sharply curtailed, or have lost their focus. Little indeed is left of the war-on-poverty programs originating with the Great Society of the Johnson Administration. A large number of special programs to subsidize labor mobility were no more than pilot efforts; long abandoned, there is little hope of reviving them. The rural migration turnaround in the 1970s was probably instrumental in halting major initiatives to aid rural areas. Although several of the area and human resource development programs were fairly cost effective, the federal efforts were too small to have major impact on rural poverty and underemployment (Tweeten and Brinkman 1976). Progress made on these fronts has been mainly from conventional schooling and vocational-technical training and by market forces guided by price and wage incentives.

Despite marked progress in ending regional and area differences in income per capita, many rural areas continue to have high incidence of poverty and underemployment. These areas include Indian reservations, Appalachia, the coastal plains of the Carolinas, the Black belt of Alabama and the Mississippi Delta.

The only significant initiative proposed by President Reagan for depressed areas is tax exempt industrial enterprise zones for low income areas of large cities. This program could be extended to depressed rural areas, since the need is as great there as it is in metropolitan areas.

Previous federal rural development programs lacked focus as well as funding. The emphasis was on unemployment, when a strong case could be made that a more worthy criterion for rural areas was underemployment (Gilford et al. 1981, pp. 144, 145). No effort has been made by the federal government to provide improved underemployment statistics. Chances seem remote for providing needed data in the future to focus rural job development programs. A wise strategy for rural political interests is to work for a wage/earnings supplement and other self-targeting programs rather than for a federal industrial development program.

Institutional Framework

Experts reviewing rural development policy have been highly critical of the federal institutional framework. Department of Labor programs have been designed mostly for urban workers; Department of Housing and Urban Development programs primarily for metropolitan residents; and Department of Agriculture programs mostly for farmers. These programs have been criticized not only for ignoring needs of rural people but also for failing to understand the unique nature of rural institutions (Blakely and Bradshaw 1983, p. 74). Blakely and Bradshaw propose that programs for rural areas be removed from the nationwide framework under which many are now administered within each federal department and be separated in a rural section under an assistant secretary within each department. Historically such efforts have been attempted with few positive results. Another potential reform would be to combine all rural housing, work force, and economic development activities into a new Department of Rural Development, but such a measure has little chance for success. The third alternative which I recommend as noted earlier is to design self-targeting programs, such as the wage/earnings supplement, that require minimal administrative discretion.

As stated above, much of the uniqueness of rural communities has diminished over the years. Rural-urban socioeconomic differences have declined. The industrial and employment structure of rural counties is surprisingly similar to that of urban counties (Tweeten, 1983 pp. 176, 177), although extractive industries remain more prominent in rural counties. Capital and commodity markets have become more fully integrated among sectors, regions, and nations—a process speeded by the Depository Institutions Deregulation and Monetary Control Act of 1980. These changes, coupled with improved transportation and communication, weaken the case for separating the administration of economic development programs into rural and urban components.

Summary and Conclusions

This paper began with the premise that new federal policies to improve the well-being of rural people must be viewed within the context of nationwide policies to improve the well-being of people. That is, emphasis must be on programs and policies dealing with rural economic and social problems through gains in economic efficiency and equity without causing offsetting losses in urban areas.

The most pressing current economic problems in agriculture are financial stress caused by high real interest rates and excess capacity caused by the high value of the dollar in international exchange. Both problems have roots in uncontrolled full-employment (structural) federal deficits. High real interest and exchange rates also cause serious problems for the mining, lumbering, and textile industries that are often a major economic base for jobs in rural areas.

Longer-term problems for agriculture include economic instability, poverty, the demise of the family farm, and environmental degradation. Poverty and underemployment are the major continuing long-term problems in rural areas. The unique feature of rural areas (which increasingly cannot be distinguished from urban areas in other attributes) is spatial. The dispersion of population and firms in rural areas gives rise to numerous problems in transportation, communications, and delivery of services; however, most of these problems can be overcome by local planning, organization, and financing if the economic base is strong.

Most of the economic gains in rural and other areas have come from individuals and firms responding to the price and wage incentives of the market. Unfortunately, the government has frequently been a source of market distortions.

The first priority is to create a favorable economic environment for individual and company decisions through sound macroeconomic policy. Immediate federal action is necessary to bring down real interest rates by reducing federal deficits. Such action would benefit rural industries directly and also indirectly through the lower foreign exchange value of the dollar. A lower value of the dollar would expand farm and forest exports and reduce imports competing with mining and textile industries prominent in rural areas. But market and macroeconomic policies alone will not solve problems of poverty and pricing decisions distorted by differences between private and social costs (benefits).

In sector policies, changes are needed in commodity programs for agriculture. If government spending is to be restrained while maintaining a safety net for farm income and preserving family farms, greater targeting of farm programs seems essential. This implies targeting credit assistance to farms in financial crisis and commodity program payments to family farms. Greater reliance on direct payments to small and mid-sized family farmers implies less reliance on supply control and on farm price supports. Loan rates would need to fall to levels clearing markets without production controls or accumulation of excessive commodity stocks. A modest long-term program to remove land prone to erosion or irrigated from nonrenewable underground water from crop production would remove some excess production capacity while preserving natural resources.

Several initiatives to reduce underemployment and poverty in rural areas have been proposed, including a wage/earnings supplement as the major one. This program would apply to rural and urban areas alike but would be of special benefit to rural areas with high underemployment. The program would be financed by tax changes and the termination of other programs.

Suggested options for raising federal revenues include the following: (1) the investment tax credit and rapid depreciation allowance; (2) limiting home mortgage interest deductions; (3) taxing or income-conditioning Social Security payments; (4) eliminating or reducing allowances for interest-free bonds; (5) eliminating corporate taxes, but taxing all corporate earnings and real capital gains as ordinary income prorated each year to individual taxpayers; and (6) raising estate taxes. Federal revenue sharing and subsidized loans and grants for community services would be reduced or terminated. Although the federal government would provide fewer funds for most community services, it would provide more funds for welfare and education. Greater federal funding for community schools would free some local taxes to pay for community services.

Rural industrialization programs to bring jobs to people peaked with creation of the Economic Development Administration in 1965 and the Rural Development Act of 1972. Some job-creating efforts were cost effective but had relatively little impact on depressed rural areas because their funding was low. As funding has declined from even the low earlier levels, the programs have lost focus. Perhaps it is time to terminate these programs.

President Reagan's proposal to create jobs through tax incentives in enterprise zones could be extended to depressed rural areas. But past failures to provide adequate funding or focus to area industrial development programs do not give much basis for optimism about future success. My proposed wage/earnings supplement is an attractive alternative because it would target assistance to marginal workers while relying on the market to locate jobs where costs are lowest, although the supplement has little chance of funding in the immediate future.

Whatever the future direction federal policy takes, rural communities will continue to be challenged to utilize their limited resources more effectively in serving the needs of individuals and businesses. The state extension service continues to play a vital role in helping communities plan and organize more effectively. Its programs need to be strengthened, while, of course, an effective research base must be maintained as essential to a sound extension effort.

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Comments on Session IV

Don F. Hadwiger

The preceding two papers, in suggesting policies for agricultural and rural development, use an insight that has been given major attention at this conference: for a majority of communities within the region, nonfarm jobs contribute mightily to agricultural development. Such jobs distribute income more equitably to farm families, help recycle income, preserve small and middle-sized farms, and can add stability to the farming enterprise. Nonfarm jobs also help preserve the mass of people needed to keep the grocery store, the school, the post office, ultimately even the court house in operation. To create nonfarm jobs, Luther Tweeten offers a federal wage/earnings supplement. Flora and Darling provide formulas for communities themselves to develop nonfarm industries.

The papers thus deal imaginatively with the agenda given them at this conference—to understand and act upon the interdependence between agriculture and the rural community. But other agendas impose upon this relationship—among these, the farm crisis in much of our region, the insolvency of state and national governments, and the pathologies of international trade. While these and other national crises are not really our agenda, they must be confronted because they are ravaging rural communities and agricultural economies.

Luther Tweeten does accept these other agendas and unites them. Tweeten, in his search for new policies, finds a rural America that is culturally not much different from urban America, but is quite differently affected by current economic and political constraints. Federal fiscal policy, which produced a strong dollar, has, as he notes, "damaged export industries—agriculture is a prime example. The financial crisis caused by high real estate rates has especially ravaged mid-sized family farms," he continues, "Land values depressed by high interest rates and massive interest costs have caused widespread farm failures. . . ." Tweeten thinks the problem of the strong dollar should be addressed directly with an increase in the money supply. Thus he—and other modern agricultural policy advisers—achieve empathy with the Greenbackers and Free Silver Populists of the 19th century who were convinced, as William Jennings Bryan put it, farmers were about to be crucified on a cross of gold. Tweeten adds that other rural industries than agriculture—textiles and mining—have also suffered as the high dollar destroyed their competitive advantage. So, although rural America nowadays may be much like urban America, the macroeconomic policies that produced American prosperity have produced severe rural distress, and one reason for seeking to change macroeconomic policy is to create a favorable economic environment for agricultural decision making. Until such an environment can be produced, Tweeten favors governmental support of farm income, targeted for the survival of middle-sized farms.

Tweeten's major agenda proposal—a wage/earnings supplement—is not offered as a program specifically for rural America but rather as a component of an efficient national fiscal policy that is also equitable for rural America. A fiscal policy that balanced the national budget would thereby alleviate many national problems, and the wage/earnings supplement would remedy the problem of unemployment now addressed by deficit spending. A wage/earnings supplement would, in Tweeten's judgment, "especially benefit rural areas characterized by low income and underemployment" and "would better serve the working poor and households with an able-bodied male present—characteristics found disproportionately in rural areas." Luther Tweeten even specifies taxes to finance this program.

None of Tweeten's proposals is likely to be offered as a sweetener in the farm bill. He thinks his earnings supplement is attractive, but "has little chance of funding in the immediate future." Indeed the proposal apparently has no supportive constituency. It might be actively opposed by unions because it sacrifices the minimum wage. Small business people who might be aided by it are weary of payroll interventions. Further, for novel proposals an incubation period of several years is usually needed, during which time support is to be gained and opposition is to be mollified.

What is politically feasible today? Governments have no money, and this national administration is averse to seeking governmental solutions. On the other hand, change may be ushered in by crisis. The deficits in budget and trade have become ever more aggravating. There is the tumor of farm distress that may be compelling once it is perceived to be malignant. One can construct scenarios by which the budget deficit is to be addressed—for example, Congress would propose a constitutional amendment to balance the budget, following which the legislatures would approve and the courts would somehow mandate a balanced budget. In that setting, would not economic rationality be dearer?

Tweeten also acknowledges the need to prove administrative feasibility. But he does not recall the earlier—reassuring—experiments with income supplements here and in other governments.

To summarize, Tweeten, in a masterful way, has met the challenge of suggesting a range of programs to meet the crises of our times, and to tap rural/agricultural interdependencies. There remain serious questions of political and administrative feasibility.

While national and state governments should provide an environment for agricultural and rural development, agricultural communities must organize themselves to develop off-farm employment. Cornelia Flora and David Darling provide suggestions as to how this can be done. Flora and Darling address "the task of capacity building in the agriculturally-based rural community, isolated

from markets, limited by shortages of labor, capital, and management talents," and which for the immediate future must tolerate a devastating decline of the agricultural industry.

Flora and Darling challenge these communities to save themselves. Where earlier planners urged communities to assess their limited resources before setting high goals, Flora and Darling assume that "profound changes can be made by the community." A desirable scenario in this change process might be to create a long-range development committee made up of volunteer leaders, who mobilizes community resources in behalf of home-grown industry. Communities would command their own destiny by reversing some (not all) of the dependency relationships with outside entities, learning to control external resources for their own advantage.

There is no question that this would be a heroic effort. Local leadership is scarce, as are management skills. Economic development is the most difficult area for community organizing. The authors say, "Motivated community leaders must take on a rigorous period of training and linkage to specialists in specific aspects of growth and local financial liability if a self-help model based on local rather than imported income generation is to be successful."

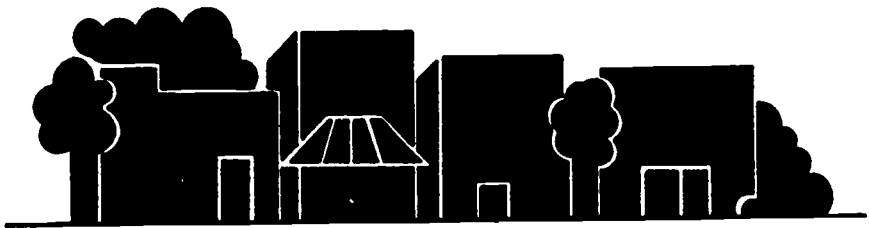
An umbrella organization would mobilize community solidarity, establish linkages with necessary resources, and then use these to increase the pool of resources available in the community. Goals would include not only growth but also institutional development, stability, freedom, and justice. This umbrella group would mobilize the community in support of local industries.

I think Flora and Darling should do more to clarify the limitations of this process. I wonder whether the process they suggest is likely to be confined to community-level action. It immediately occurs to me that the trade centers being proposed in agricultural states would be seen as useful institutions that communities would join in supporting. Indeed this impulse to gain independence through cooperation is quite the same as that of the old Nonpartisan League (NPL) of North Dakota that sought to relieve itself of outside bankers, railroad companies, insurance companies, and others. The NPL moved to a larger-than-community process and ended up owning North Dakota's businesses. I wonder whether Flora and Darling's communities would not soon find themselves seeking an infrastructure of services that they as individual communities could not provide. The authors themselves talk of cooperative funeral services for small communities and credit unions that would take the place of vulnerable small banks.

Crisis leads us to advocate heroic effort, and also, as with Tweeten's wage-earning proposal, to advocate efficacious programs that would not ordinarily be politically feasible. Crisis also leads us to try many things, not just one "solution." This conference has suggested a number of policies, including:

1. Production of new knowledge and technical assistance;
2. Maintenance of rural transportation;
3. Improved telephone service;
4. Natural resource development;
5. Programs to assist people in coping with change; and
6. GI Bill-type programs for retraining people to move into nonfarm employment.

In my opinion the rural resurgence of the 1970s was due in part to the profusion of federal rural development programs, undeniably with a pork barrel flavor. These federal resources made it possible to hope, to plan, to coordinate, and to implement development. These programs coaxed increased effort and resources from state and community levels. The financial and structural crisis in rural America today seems to require another intense federal presence. A many-faceted federal involvement might include a wage/earnings supplement and other measures suggested at this conference. In such a nurturing policy environment, local efforts such as those suggested by Flora and Darling might seem less heroic but more realistic.



Panel: Comments by Administrators

Chapter 13

Research and Extension Needs to Take Advantage of Opportunities for Agricultural and Rural Development

Implications for Research and Extension Policy and Programs—Roy G. Arnold

Overall Content of Conference

Overall, this conference has had an excellent program, with good papers and good discussion. The conference has accomplished the goals of broadening of perspectives and provoking thought about issues. Active interchange of ideas has occurred. I have learned a great deal personally, which I suspect was a hidden objective of my being invited to participate.

Topics adequately covered in the conference included trends and changes in agriculture in rural communities, implications of these trends for the future, and current financial stress in agriculture. In my judgment, however, insufficient attention was given to continuing, underlying strength of agriculture and rural communities; self-employment needs that have been discussed; and the role of nonresident landowners and farm managers, particularly their long-term self interest in the strength of rural communities, and corresponding motivation for continued investment in rural areas.

Implications for Policy and Programs

As background, it is important to note that research and extension programs operate within an institutional setting that is also experiencing severe financial constraints. The "three Rs" in higher education presently mean reduction, redirection, and reallocation. Hence, new or expanded program thrusts are largely the result of redirection of resources and reordering of priorities. Second, many organizations and agencies are involved in community development programs. Interagency cooperation and collaboration opportunities exist and need to be pursued aggressively. Third, each state's situation is unique, with regard to its specific mix of organizations, agencies, and programs. Also, implications for land-grant university programs extend beyond programs in agriculture and natural resources to include business, medicine, and many other program areas.

Given those background observations, I offer the following random thoughts and observations.

We need to clearly define and articulate our roles, as land-grant universities, in rural community development, and our relationships to other actors in this field. We are principally engaged in research and education, as opposed to providing direct services, except for specific service functions that may be stipulated by legislative action in specific states.

Research and extension programs need to be targeted carefully and specifically. We need to do a better job of strategic planning, to assess the specific needs and opportunities in our respective states, and to determine the unique contributions that we can offer uniquely, in response to those needs and opportunities. This includes the need to continually reassess our constituencies. In response to the changing structure of agriculture. With the emergence of a bimodal structure in agriculture, I would suggest that we need a better term than "part-time farmer" to characterize that clientele group. There is a connotation within all organizations that "part-time" may be less important or less committed than full-time. "Part-time farmer" suggests that farming is the sideline activity and may understate the commitment of these individuals to agriculture. Terms such as "dual vocation" or "diversified income" farmers should be considered. In my judgment, if we are serious about addressing the needs of this clientele group.

Generally, there is a need to broaden the perspectives of our faculty and staff. We need to expand the vision of many faculty and staff beyond their immediate disciplines to the "big picture," particularly with regard to the changes that are occurring in agriculture and rural communities. Perhaps through workshops or faculty development leave opportunities this can be accomplished. Although the topic here is research and extension programs, there are strong implications for resident instruction programs, which I note are consistent with many of the "excellence in education" recommendations now being widely discussed.

Also relating to narrowness of perspective, we need to work on attitudes about change. Those of us in land-grant universities need generally to be more accepting and responsive to change. We should be change leaders. We have a role in defining and evaluating alternatives, in offering education programs to help people deal and cope with change, and to develop leadership among our constituents to be proactive in influencing the directions of change. Some of our critics may be correct in suggesting that we have a tendency to plod along solving problems that have gone away.

Consistent throughout the presentations at this conference has been the theme that local leadership is essential. Earlier Title V studies of Nebraska community development strongly highlighted the essential role for local community leadership. We cannot expect to have the staffing to service the demands from individual communities. Dr. Holberg commented in his paper that we frequently misfocus on development of place versus development of people. In a recent long-range planning effort in our state entitled AG 2001, a group of 150 Nebraskans placed their highest priority emphasis on human resource development as the appropriate role for the land-grant university. This includes development of leadership skills.

Many land-grant universities have recently increased their role in providing technical assistance in support of economic development objectives within their respective states. We do have a role to play and contributions to make in this arena. In Nebraska, we recently established a Food Processing Center, which is providing this type of technical assistance to individual processors. The response has far exceeded our expectations when this unit was established. As land-grant universities, we must continue to work at legitimizing this type of work as an acceptable component of our overall mission. Clearly, we cannot allow this to displace our fundamental missions in research and education, but it is an appropriate additional role for our institutions. In the parlance of *In Search of Excellence*, this is yet another way in which we can be "close to the customers."

Many of our traditional programs, in areas of production efficiency, resource conservation, etc., will continue to be of importance in agriculture and rural community development, particularly in the longer term. Many adjustments are being made in the balance of our programs, with greater emphasis in financial management, utilization, marketing, leadership development, etc. However, the traditional programs in production and resource management will continue to be important to the economic viability of agriculture.

In her comments, Dr. Flora used the phrase, "turn crisis into opportunity." A recent personal letter from Robert Theobald contained the statement, "Crisis produces both the threat of breakdown and the potential for positive change." Certainly land-grant institutions are faced at the present time with such potential for positive changes, both internally and externally.

Finally, as a closing observation, we have a tendency to focus too much on what isn't being done and not enough on what is being done and its positive impacts. Basic strengths exist in agriculture and rural communities. Basic strengths exist in the programs that are presently offered by the land-grant universities in research and extension. Opportunities continue to exist in agriculture and rural communities. Although we can't ignore the problems of the present time, let us not lose sight of the opportunities.

A CRD Leader's Perspective and Reaction—Don Swoboda

After two full days of hearing from 27 specialists in community and rural development and four land-grant administrators, I'm not sure what is left to say.

I was asked to give my reaction to the overall content of the conference from the perspective of an Extension CRD program leader (which is one of my current responsibilities). I also have overall program coordination responsibility, which makes me particularly interested in interdisciplinary and interprogram area educational efforts.

Frankly, I perceive that we've spent the last two days talking about problems, educational program research needs, and policies issues that do, in fact, deal with issues that are broader than what we have traditionally defined or thought of as being "Community Development."

A recent *Lincoln Star* news article illustrates the need for a broad approach from our land-grant institutions and other resources as well, to deal with effecting solutions through educational programs.

As Dick Sauer suggested in his opening remarks, we must draw on college disciplines not traditionally worked with within our programs, and I would add we need to be the ones to make the initial contacts.

Several speakers have pointed out that although there is similarity in the types of problems faced in agriculture and rural communities across the region, there is also much diversity in the extent or intensity of the specific problems faced on a state-by-state basis.

Opportunity for nonfarm employment, for example, varies widely among the states. We must, I believe, be creative in our thinking to assist communities to identify potential employment opportunities but also assist farm people to think about identifying and using the talents they have in creating their own opportunities, whether a home-based business in a nonagriculture-related area or some form of directly related agriculture production activity that will reduce the risk and uncertainty they face in managing a farm. I agree with Flora in that it takes both individual entrepreneurs and community awareness.

It was pointed out that in several of our Plains states where farm dependency is the greatest, alternative nonfarm employment opportunities may be considerably more limited. However, for a state like Nebraska, Hiness's data would suggest that "value added" processing and marketing opportunities should provide some comparative advantage.

I believe that this group would agree that not only are agriculture and rural communities interdependent (as the conference title suggests), but in today's society virtually inseparable. Shaffer put it well when he suggested we must go about—"improving the well-being of rural people . . . regardless of which side of the farm gate they live."

Brady Deaton was the first speaker at the conference to really stress the importance of local leadership. Others seemed to imply it but didn't really state it. Extension has traditionally been responsible for providing very strong and positive leadership development programs, through agriculture and natural resource programs, 4-H, home economics, as well as CRD.

The reality that we must be aware of is that in many instances as a result of this financial crisis that we are in, we may lose many of the leaders, too. One extension agent in a Nebraska county indicated that 60 percent of his adult 4-H leaders were in financial trouble, including the chairman of the local extension board and 4-H council. Although this is an isolated case, we must continue to provide assistance and support to the development of community leadership.

As a program leader, I recognize that in most of the North Central states, we operate with very limited resources. To me, this means we must make some decisions on priorities, which sometimes are difficult. I believe that factors we must consider to determine where our efforts should go include the following:

1. **Long Run Versus Short Run.** Although we may have to provide some emergency-type assistance to deal with the immediate or short-run problems, we must concentrate our efforts on programs that will make a difference to agriculture and rural communities in the long run.
2. **Extension Can't Do It Alone.** We must identify and involve all of the actors involved that have resources to bring to bear on the problems; these include state and local government agencies, public and private organizations, and all those in the political arena. We need to cooperate and coordinate, *not* compete and criticize.
3. **Public Policy Implications.** Do we need to provide more information, to assist in the establishment, modification, or changes in our policies affecting agriculture and communities? I applaud Luther Tweeten in being courageous enough to articulate some rather radical policy options. We need to do this. We need to stimulate public thinking, leading to political action. I've heard several people suggest that we need a long-run policy on *food* in this country. I've also heard that we need people to think broader than a "Farm Bill" because the policy affects more people than farmers. Yet I only heard one person acknowledge the fact that the 1977 and 1981 bills were titled "Food and Agriculture," rather than "Farm Bill." Maybe if we used a broader term than "Farm Bill," other people, including policy makers, would begin acknowledging and thinking about a broader perspective also. Sometimes change agents are the hardest to change.

4. Are Our Programs In Perspective? Even though we're concentrating on rural development and agricultural development here, primarily the non-metro areas, we must not ignore the metro areas and the total relationship perspective in terms of society and politics.

I've enjoyed the opportunity to participate in this conference and congratulate all of you for your attendance and participation, the presenters for their fine papers and ideas, and the conference sponsors and steering committee for putting it all together.