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Persistent poverty and natural resource dependence: rural development policy analysis that incorporates income distribution

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Abstract. In this paper we discuss prospects for rural economic development and the use of social accounting matrix (SAM) analysis to identify the distributional characteristics of local markets and development programs in natural resource-dependent regions. The paper begins with a discussion of persistent rural poverty, including causal factors and the problems associated with natural resource dependency. A SAM is used to examine the distributional characteristics associated with local economic development policies targeting agricultural production, agricultural processing, forestry production, forestry processing, and tourism for a small rural region in Wisconsin. The analysis also investigates the distributional impacts associated with simultaneous and variable change between economic sectors and the impediments to development that dependence on a disproportionately large economic sector presents. The results suggest that the distributional impacts do vary by sector. SAM analysis is a means whereby local development policies can incorporate additional information important to addressing questions of lagging rural income growth.

1. Introduction

Recent literature tells a “tale of two cities” in evaluating prospects for future economic well-being in rural areas (Drabenstott and Smith 1996; Smith 1992). In general, rural counties located adjacent to metropolitan areas, those having achieved sufficient agglomeration economies to become regional centers, and those with scenic amenities seem to have the brightest prospects. Conversely, the larger number of rural counties that have been unable to overcome their remoteness or that remain

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overly dependent on natural resource industries have a relatively bleak economic outlook.

In addition to the challenges associated with economic trends and structural deficiencies, rural areas also have to contend with a substantially less favorable policy context. Rural areas long have experienced problems of low income and lagging income growth. With the likely decline of federal funding in income maintenance and local economic development, the prospects for improving the situation of poor persons in rural areas appear dim. The responsibility for local economic well-being increasingly is being returned to states and communities. These levels of government have shown little appetite in recent years for increased funding of public programs. Instead, private markets are seen as the primary mechanism to provide for local well-being.

If problems associated with inadequate income for persons at the low end of the income distribution are to be addressed, more attention must be focused on the distributional characteristics of private markets at the scale of local labor markets and on the distributional consequences of local economic development policies. To date, local policy makers and development practitioners have paid little attention to distribution as an explicit goal of local economic development programs. Aggregate growth has been seen as a sufficient goal for most development programs with assumed beneficial consequences for persons at the low end of the income distribution.¹

This paper discusses prospects for rural economic development in natural resource-dependent regions and the use of regional modeling techniques to identify the distributional characteristics of local markets and development programs. Given the persistence of low income growth (particularly among low income households in resource-dependent regions), it is becoming more important to identify the beneficiaries of economic growth. When the distributional characteristics of individual production sectors are known, it becomes possible to incorporate distributional objectives in local economic development programs.

The paper discusses persistent poverty in rural areas, acknowledging causal factors and the added problems associated with natural resource dependency. It examines development prospects associated with economic sectors typical of many resource-dependent regions, including agriculture, forestry, and a strategy many rural communities hope can emerge to serve as an alternative economic base: tourism. The use of social accounting matrix analysis is introduced as a technique for rural development decision making that can help address problems of low income levels and persistent poverty. Its use is illustrated in an analysis of distributional characteristics of income generated from agriculture, forestry, and tourism in a small rural region. Understanding the distributional characteristics of rural economic sectors makes it possible to incorporate explicit goals related to the distribution of income in local development policy.

¹ There is a body of literature supporting this claim. For example, in reviewing a large number of studies, Bartik (1991, 1994) concludes that growth in metropolitan employment has short- and long-run net benefits for persons in the lowest income quintile.

led to leases and federal income transfers that tend to benefit higher income operators and corporations at the expense of small operators and corporate competitors.

Nonlocal ownership of resource extraction industries also perpetuates poverty in resource-dependent regions. Corporate interests exhibit little concern for local welfare or community stability, favoring shareholder interests instead (Peluso *et al.* 1994). Natural resource production regimes and macroeconomic capital flows also lead to the creation and concentration of poverty (Nord 1994).

Frequent volatile shifts in commodity demand on international markets lead to boom-bust cycles in many resource-dependent regions (Fieleke 1994). Rural residents conditioned by the frequency of market swings, having few skills beyond specialized extraction, and having personal ties to a location are often immobile despite poor economic conditions. International political conditions also tend to exacerbate the volatility of commodity markets.

Finally, the condition of the natural resource also can lead to cycles of temporary or long-term poverty. Depletion of nonrenewable resources (minerals and oil), the rate of renewable resource extraction (fisheries and forestry), and problems of weather and disease (farming, forestry, tourism) can lead to dramatic decreases in local income for dependent regions (Ghelfi and Saupe 1986).

3. Development prospects for selected natural resource-based sectors

Despite the desire for a more diverse economic base, many rural areas remain dependent on natural resource industries. Remoteness and/or the inability to establish a cluster of economic activity sufficient to generate endogenous growth leave these areas with little choice but to work toward the development of these sectors. Understanding more about the development potential of natural resource sectors may help to forestall decline or facilitate agglomeration economies. Thus, we turn to a brief discussion of prospects related to agriculture and forest-based economic development. We also include tourism, a sector many rural communities hope will become a new growth opportunity.

3.1 Agriculture and food processing

Farming-dependent counties are the most common type of rural economic structure (Cook and Mizer 1994). In 1989 556 nonmetropolitan counties (24.4 percent) received 20 percent or more of their earnings from farm production. While farming and food processing are vertically integrated activities, the states most dependent on farming are not generally major food processors (Barkema *et al.* 1990). Farming-dependent counties have the weakest base and most variable employment and earnings performance of all rural counties (Sears *et al.* 1992).

Long-term trends toward the structural transformation of agricultural production are expected to continue. The movement toward larger farming operations is the result of a complex set of factors (Barkema and Drabenstott 1996; Huffman and Evenson 1993; Goe and Kenney 1991; Reimund and Petrusis 1988; Tweeten 1989).

2. Rural poverty: causal factors and problems of resource dependence

Rural areas long have experienced problems of low income levels and lagging income growth. There are numerous factors that cause or exacerbate problems of low income in rural areas. The first relates to the structural transformation of the rural economy in recent decades (Brown and Deavers 1987; O'Hare 1988; Bernat 1992; Fieleke 1994). Rural economies have shifted from heavy dependence on natural resource-based industries to increasing dependence on low skill and low wage manufacturing and service industries. This makes rural areas more vulnerable to international competition, technical change, and fluctuations in business cycles. In addition, nearly all traditional rural industries (agriculture, mining, and manufacturing) experienced relative downturns during the 1980s.

Another reason frequently cited for lagging income growth in rural areas is the character of the work force (Teixeira and Swaim 1991; McGranahan and Gelfi 1991; Killian and Parker 1991). Many rural workers have a deficit of individual skills, training, and work experience. Earnings are lowest and poverty rates highest among those with the least education. The best educated rural youth migrate to urban areas seeking better job opportunities (O'Hare 1988; Teixeira and Mishel 1991; McGranahan 1991). Those who remain are able to support only less productive, low wage jobs (Johnson and Stallmann 1994). In addition, many of these workers have other work-inhibiting demographic and family impediments such as the lack of child care and transportation (Rural Sociological Society 1993).

A third reason for lagging income growth in rural areas is the higher proportion of dependent persons (Adams and Duncan 1992; Ross and Morrissey 1989). Nonmetropolitan counties have higher percentages of the elderly and persons with disabilities and about the same percentage of female-headed households as metropolitan counties. Many of these persons are not self-sufficient.

2.1 Problems of resource dependence

In addition to the general factors fostering lagging income growth in rural areas, other conditions may exacerbate poverty in areas dependent on natural resources as an economic base. Government management, nonlocal corporate ownership, commodity markets, and the nature of the resource itself also lead to poverty and perpetuate it (Krannich and Luloff 1991; Freudenburg 1992; Bunker 1989; Lobao and Schulman 1991; Brown and Warner 1989). These conditions can apply in regions dependent on agriculture, forestry, fisheries, mining, and recreation and tourism as the principal source of economic activity.

Dependency with both government bureaucracy and corporate interests may lead to rural poverty (West 1994; Freudenberg and Gramling 1994; Obermiller 1982). In areas with significant federally owned land holdings, government agencies are powerful forces in dispensing use rights and income transfers. Influential user groups have had disproportionate access to the policy-making process (West 1994). This has

Agricultural technologies, the productivity associated with economies of scale and specialization, and farm capital requirements favor larger farm operations. In addition, federal farm policies and assistance programs, farm financial institutions, and tax policies also support the transition. Larger operations are also better able to adjust to macroeconomic conditions and changing consumer tastes than are smaller operations.

While the transformation of the agricultural production system has improved productivity and international competitiveness, it has also led to severe dislocations for a large number of rural persons (Mazie and Killian 1991). One impact of the changing production structure on rural communities has been an increasing dependence on off-farm income to supplement small farm income (Hoiberg and Lasley 1986; Henry 1986). Even as the need for off-farm employment increases, however, large farm operations are reducing economic linkages to small rural communities. Larger farms internalize many functions to achieve economies of scale and purchase lower cost farm inputs at regional trade centers (Heffernan and Campbell 1986; Lins 1991; Henry 1986; Murdock *et al.* 1989). Finally, large industrial farming tends to be associated with higher levels of poverty, labor exploitation, and economic dependence (U.S. Congress 1986).

Agriculturally dependent regions seem poised to successfully compete in domestic and global markets (Drabenstott 1996). As federal commodity programs are phased out, however, questions arise about the ability of smaller operations to successfully manage risk and survive amid market fluctuations. Despite farm support payments that disproportionately benefit large and wealthier farms, the reduction in the programs will substantially affect many small farms and the communities to which they are tied (Harrington 1988; Murdock *et al.* 1989; Paarlberg 1989).

For some rural areas, expansion in food processing may be feasible as a means to expand local employment (Deaton 1986; Hines *et al.* 1986). In those states with access to major population centers and with a current base of both production and forward-linked processing sectors, there may be opportunities for capturing and increasing the amount of regional value added (Barkema *et al.* 1990). Given the importance of market access and the capital-intensive nature of processing activities, it is unlikely there will be significant growth for more remote rural areas or traditional farm commodities.

3.2 Forestry and forest products

The forest sector consists of several vertically integrated production activities. At the base is timber and fiber production from public and private sources. Industries making direct use of these raw materials include sawmills, solid wood products, and reconstituted wood products such as particleboard, waferboard and paper. In 1984 159 nonmetropolitan counties (about 6.6 percent) were classified as economically specialized in forestry and wood products industries (Weber *et al.* 1988). Prospects in the forest sector are likely to show significant regional variation based on the timber species produced, land ownership, and the processing industries present (Haynes and Adams 1992; Haynes 1990; Alig and Wear 1992).

Depending on supply conditions, many forest products industries will experience differential growth opportunities. The source of supply for softwoods is shifting from the west and Pacific regions to the south. The outlook also varies by regional forest land ownership patterns (Haynes 1990). Private industrial owners have the greatest flexibility to intensify management regimes and alter harvest rates in response to economic conditions and long-term demand. Most expansion in private industrial activity is projected for the south. The nation's public forests in the west likely will see a reduction of harvest rates in response to increasing demands for multiple use management objectives (Roth 1991; Lee 1989).

Several management concerns affect prospects for the forest sector and the rural communities dependent on forest sector activity. Increasing pressures on publicly owned forests in the west have caused severe dislocation in many western forest communities as forest industries decline (Robbins 1989). The problems stem from the draw-down of private timber inventories and the reduction of harvesting in the national forest reserves. The reductions are, in part, a response to increasing demands for the Forest Service to manage public resources in a way that reflects nonmarket values, including species preservation, recreational access, and watershed protection (Wargo 1990; Roth 1991).

A related issue deals with alternative forest management regimes. The projected increase in forestry output is dependent on more intensive management, especially of private sector supplies. Intensive management practices typified by even-aged silviculture are not always compatible with other social values held by nonforest rural populations (Rolston 1990; Clawson 1975).² Similarly, such practices may create externalities for other industries such as outdoor recreation and tourism that directly or indirectly depend on forest aesthetics and biodiversity (Clawson 1975; SchAAP 1989; McKercher 1992). This tension can, and often does, create conflicts between stakeholder groups.

3.3 Recreation and tourism development

As traditional industries decline, many rural areas have embraced tourism development strategies (Flora *et al.* 1991). Most projections have demand for tourism and recreation activities increasing (Cordell *et al.* 1990). As other sources of employment decline, rural communities are seeking alternative economic opportunities (Sem 1989; Heise 1994; Gibson 1993). All 50 states have tourism development programs in place, and 30 of them target rural tourism development (Luloff *et al.* 1994), but rarely is there a concerted effort to evaluate tourism as one of several appropriate development strategies for rural America (Marcouiller 1997).

As a rural development strategy, tourism probably has widespread applicability, but may produce only limited results in most areas (Gibson 1993). Most rural areas do not have the necessary natural, historical, or cultural amenities to serve as a basis for attracting nonlocal visitors. Similarly, most small communities are limited in the

²The term *intensive* is not well defined in the silviculture literature. There are certain uneven aged practices that also could be characterized as intensive.

local business infrastructure necessary to accommodate visitors. The development of new attractions and accommodations is beyond the means of most rural communities.

As a replacement for traditional rural jobs lost in natural resource and manufacturing industries, tourism jobs are poor substitutes (Ashworth 1992; Smith 1989). While some local entrepreneurs may do well, most of the new jobs created are likely to be seasonal and low paying. As a means to improve the living standards of most households or stemming the tide of young adult outmigration, tourism jobs are likely to provide disappointing results. There may be some benefit, however, in providing supplemental income opportunities and employment for low skilled and young local residents (Schneider 1993).

Despite relatively modest prospects, many resource-dependent communities have little choice but to work toward the development of indigenous sectors. Even then, however, rural communities often have options regarding the targeting of development assistance. Where a community has the flexibility to incorporate development goals beyond aggregate growth, the problem becomes choosing the mix of appropriate sectors to enhance long-term economic well-being.

To the extent the distribution of income is recognized as important to the development prospects of rural areas, regional modeling techniques can help inform policy makers about the beneficiaries of local development assistance. Social accounting matrix analysis can identify the distributional consequences arising from strategies related to targeted sectoral assistance and permit the incorporation of distributional objectives in natural resource planning.

4. Regional modeling to assess income distribution

Most are familiar with the basic structure of input-output accounts. Briefly, input-output (I-O) analysis is a system of accounting for the economic flows in a region at a point in time (Miller and Blair 1985). The I-O system is fundamentally concerned with the economic flows between regional industries in the process of production. I-O analysis focuses on production activities and their ability to generate value added, an aggregate measure of income.

An extension of I-O analysis explicitly addresses issues of income distribution. Social accounting matrix (SAM) analysis is a highly detailed and flexible accounting system that emphasizes income flows and uses the household as the salient unit of analysis (Pyatt and Round 1985). Whereas I-O methodologies tend to focus on the interaction of production sectors and the process of economic growth, SAM methods focus on the interaction between economic and social structures for the purpose of understanding how wealth is distributed. SAM analysis provides a comprehensive accounting of income flows and can be used to assess the distributional impacts of changes in production as well as a wider array of policy questions.

A SAM is structured in a fashion similar to an input-output table. Column headings are transposed along the side to create a square matrix totaling receipts along the rows and expenditures down the columns. While SAM construction varies depending on the research needs, it generally includes accounts related to production, consumption, accumulation, and trade (Pyatt 1991). These categories, in turn, may be broken

into a number of sub-accounts. The nature of this disaggregation varies depending on the questions the SAM is designed to answer. SAM models can be constructed to show how the economy works and, in particular, how changes will affect household income.

Social accounting matrices track economic flows throughout the economy in a cyclical framework. Production activities make payments to factors of production that variably accrue to households based on their ownership of factors. Institutions serve as critical intervening variables that organize income for distribution to households. Households, in turn, use their income as consumers, further stimulating regional production and completing the circular flow of income through the region. Leakages and infusions to the cycle are also shown in the form of savings, transfers, trade, capital finance, labor migration, etc. to fully account for the regional flow of income (Keuning and de Ruijter 1988).

A SAM can incorporate organizational structures that determine how income flows through the economic system (Leatherman and Marcouiller 1996). Production sectors vary considerably in their use of factor inputs, including land, capital, and labor. Thus, the mix of industries present in an economy and their land, capital and wage income characteristics serve as one of the important structural determinants of income distribution (Rose, Stevens, and Davis 1988). Institutions refer to the formal and informal organizational and decision-making structures that facilitate economic exchange (Pyatt 1991). Many SAMs specify institutions as consisting of enterprises, households, and government. The SAM accounting system can accommodate alternative specifications reflecting such things as market structure, rules of work and capital accumulation, land tenure, and tax systems consistent with the modeler's ability to track income flows. Both production structure and institutional organization can be used to explain existing distributional patterns.

SAM analysis has several important advantages over input-output analysis in the study of distributional issues: it focuses on the household as the unit of analysis, it considers the full complement of income sources important to distributional patterns, and it can assess the distributional impacts of a wider range of policy factors.

5. A SAM analysis of rural income distribution

To illustrate the utility of social accounting matrix analysis for the study of local income distribution, we present the results of a recent study of alternative local economic development strategies for a small rural region. The Kickapoo River Valley in southwestern Wisconsin encompasses approximately 917 square miles covering parts of four counties. Only two of 16 communities have more than 1,000 residents. About 50 percent of the land area in the Kickapoo River Valley is in agricultural use, and about 44 percent is forested. The area is generally homogeneous in topographic features, land use, settlement type, economic activity, and population demographics. The study area population is approximately 27,500, with 44 percent of the households classified as low income (less than \$20,000) in 1990, 34 percent classified as medium income (\$20,000-\$40,000), and 22 percent as high income (more than \$40,000) households (U.S. Bureau of the Census 1990).

Small scale dairy farming dominates the local economy. Several food processors make up the largest component of the manufacturing sector. While only a small component of regional economic activity, the valley has substantial hardwood timber resources and a few wood products manufacturers. Timber and wood products are seen by many local residents as having untapped economic development potential. Finally, the Kickapoo Valley is located in one of the more scenic areas of Wisconsin. Tourism is also viewed as a potential target of economic development. The study considers the distributional impacts of alternative locally initiated development strategies related to five sectors important in many resource-dependent areas: agricultural production, agricultural processing, forestry production, forestry processing, and tourism development.

The Kickapoo Valley social accounting matrix consists of a set of regional economic accounts that fully account for the flow of regional income for the 1991 base year (Leatherman 1995; Leatherman and Marcouiller 1996). Income flows are charted between productive activities, regional institutions, and household income groups. For this study, the institutional matrix organizes factor income flowing from productive activities into the five economic sectors that were targets of local development policy. A schematic showing the accounting of income flows used for this SAM analysis is shown in Figure 1.

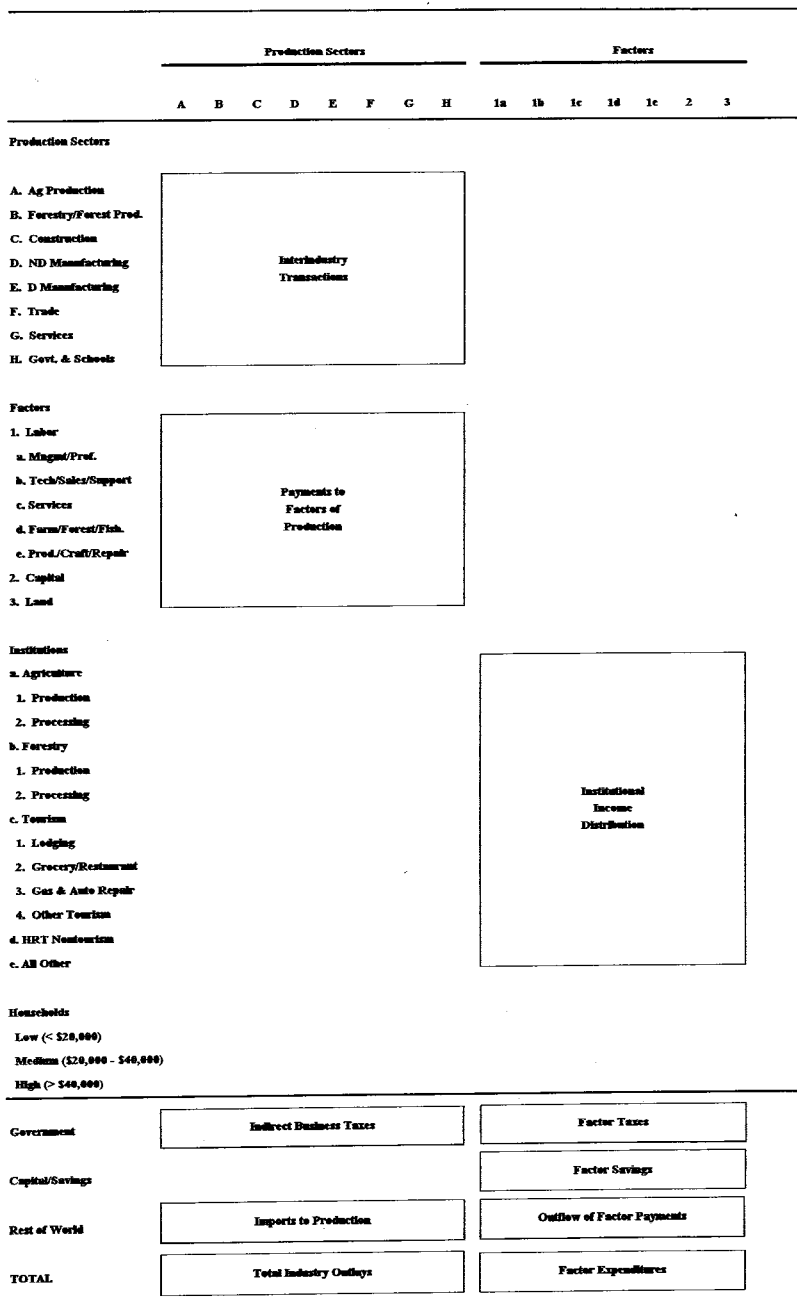
One of the primary data sources for building the Kickapoo Valley SAM was Micro-IMPLAN (Impact analysis for PLANning), version 91-F (Minnesota IMPLAN Group 1993). Information related to interindustry transactions, final demand, regional consumption by household income group, government consumption, investment, rest-of-world demand, commodity supply, and aggregate value added was taken from a hybrid IMPLAN I-O model. Much of the income information was obtained from the Bureau of Economic Analysis Regional Economic Information System (U.S. Department of Commerce 1994) personal income by source data files. Household income distributions came from the 1990 U.S. Census. Other SAM elements were derived based on national distributions and from state data sources.

To assess the distributional impacts of local economic development strategies, a fixed price multiplier analysis examines the impacts of a small change to factor income flowing to the institutional enterprise account. The enterprise account consists of factor (land, labor, capital) income associated with the group of sectors targeted by development assistance and reflecting alternative development strategies. The institutional enterprise account is net of economic infusions (transfers, commuting income) and leakages (taxes, savings), and serves to distribute earned income to household income groups. Effects are noted between income classes and across development strategies.

5.1 Interaction between economic activities and scale of production

Economic development strategies often involve trading one opportunity for another. Nearly any activity can have undesirable and sometimes unintended consequences. Growth in one economic sector may directly or indirectly lead to stagnation

Figure 1. Schematic of the SAM constructed for this study



continued on next page

Figure 1. Schematic of the SAM constructed for this study (cont.)

	Institutions										Households			Govt.	Capital/ Savings	Rest of World	TOTAL
	a1	a2	k1	k2	c1	c2	c3	c4	d	e	Low	Med.	High				
Production Sectors																	
A. Ag Production	Household Regional Demand													Government Regional Demand	Regional Investment	Regional Commodity Exports	Total Commodity Demand
B. Forestry/Forest Prod.																	
C. Construction																	
D. ND Manufacturing																	
E. D Manufacturing																	
F. Trade																	
G. Services																	
H. Govt. & Schools																	
Factors																	
1. Labor															Inflow of Factor Payments	Factor Income	
a. Mgmt/Prof.																	
b. Tech/Sales/Support																	
c. Services																	
d. Farm/Forest/Fish.																	
e. Prod/Craft/Repair																	
2. Capital																	
3. Land																	
Institutions																	
a. Agriculture														Transfers to Institutions		Institutional Income	
1. Production																	
2. Processing																	
b. Forestry																	
1. Production																	
2. Processing																	
c. Tourism																	
1. Lodging																	
2. Grocery/Restaurant																	
3. Gas & Auto Repair																	
4. Other Tourism																	
d. HRY Nauticism																	
e. All Other																	
Households																	
Low (< \$20,000)	Household Income Distribution										Transfers to Households		Unearned Income	Household Income			
Medium (\$20,000 - \$40,000)																	
High (> \$40,000)																	
Government														Household Taxes		Govt. Transfer	Govt. Revenue
Capital/Savings	Institutional Savings										Household Savings					Total Savings	
Rest of World	Institutional Rest of World										Household Imports			Govt. Imports	RoW Imports		Total Revenue
TOTAL	Institutional Expenditures										Household Expenditures			Govt. Expenditures	Total Investment	Total Inflows	

or decline in other sectors. It can occur directly in the conscious decision to target public resources to one sector while withholding resources from others. It can occur indirectly when a sector exhibits negative externalities. Thus, this study investigates distributional impacts in the context of variable performance across development sectors. Variable economic performance between sectors is investigated through the application of several scenarios simultaneously modeling alternative rates of change in factor income.

The relative size of the economic sector is another important consideration in the creation of public policies having distributional impacts. While it may be theoretically possible to influence income distribution, the relative difference in the size of production sectors can dramatically affect the outcome. For example, a policy seeking to diversify the economic base and target economic benefit by stimulating a faster growth rate in a relatively small regional sector may be overwhelmed by slower growth or decline in a much larger sector with an undesirable distributional pattern. Thus, the effect of relative size differences between production sectors also is considered. To investigate the influence of sector size on distributional impacts, the exogenous stimuli are standardized.³ This standardization is accomplished by selecting an institutional sector as a base, determining a rate of change, and proportionately adjusting rates of change in other sectors.

5.2 Analysis results

The distributional characteristics of development sectors are determined by sequential application of a 1 percent change in factor income flowing from production sectors to the enterprise institution. The distributional impacts are observed in the household income distribution matrix.

The analysis shows that high income households received between 57 percent and 63 percent of earned income from changes in factor income associated with different production sectors (Figure 2). Medium income households received between 32 percent to 41 percent of earned income, and low income households received about 2

³Specification of an exogenous change can take many forms. For this study, the standardized exogenous impact for any institution (E_n) is calculated as:

$$\Delta E_n = X_b[r(Z)]$$

where X represents institutional outlays (minus institutional transfers), r is some rate of change, b is any institution chosen as the base among n institutions, and Z is the ratio of the institutional outlay for the base to the institutional outlay for any other institution (X_b/X_n).

Equalizing the size of the impact in this fashion allows us to look at the relative distributional impacts among sectors. Inflating the size of the impact, however, retains the fundamental structure of interindustry relations. In a large sector such as agriculture in this case, many interindustry linkages have been established. Inflating a small sector such as forestry only makes larger the relatively sparse linkages that currently exist. The alternative method of evaluating size differences would be to compare SAMs constructed for different rural regions and consisting of variable economic structures. This was beyond the scope of this research.

percent to 6 percent of earned income. These distributional patterns are attributed to the variable ownership of productive factors by household income classes.

The differences between development strategies are relatively small. Within the high income class, agricultural processing distributed the largest proportion of any development strategy at 63 percent, followed by tourism at 61 percent. The middle income class received its largest relative share from the agricultural and timber production activities, 41 percent from both. The low income class received its largest relative share of impact from tourism at 6 percent, and its smallest share from production activities.

Alternative scenarios incorporating variable rates of change in factor income are used to explore distributional impacts. The scenarios present a range of development possibilities and are not intended as predictions for the Kickapoo Valley. Rather, the scenarios represent development trade-offs that reflect a hypothetical matrix of land use compatibilities. The five scenarios model variable rates of factor income change and include:

- Agricultural production and processing increases while other institutions show declining income;
- Forestry production and processing increases with declines in other institutions;
- Tourism increases with declines in other institutions;
- Increases in forestry and tourism with declines in agriculture; and
- Increases in all institutional sectors.

The five scenarios and the assumed rates of institutional income change are summarized in Table 1.

A standard fixed price multiplier analysis is used to assess distributional impacts. The analysis first considers the impacts using the actual size of institutional sectors in the Kickapoo Valley and then under conditions of equalizing the relative size of the impact. The vectors of factor income change are calculated as a percentage of total factor income minus institutional transfers. The impacts shown in Figure 3 are actual dollars.

Overall, the effects of the agricultural production institution dominate all scenarios. The scale of agricultural production overwhelms even robust growth assumptions in other regional institutions. The first three scenarios in Table 1 show the importance of agriculture to middle and high income classes. Scenario 3, however, which models tourism growth in the context of other sector decline, shows the low income class benefiting slightly while other income classes decline. Growth in tourism also substantially reduces the negative impact of agricultural decline for the high income group. These relationships come into clearer focus in scenarios 4 and 5 where both low and high income groups receive modest benefits under conditions of tourism growth. The tourism sector tends to use factor resources at either end of the distribution, i.e., either low skill jobs taken by low income workers or higher salaried managerial positions and high income business owners who control profits. Middle income households are represented more heavily in the production and processing sectors.

Figure 2. Proportional income distribution impacts to household income groups associated with a 1 percent change in factor income reflecting alternative local development strategies in Kickapoo Valley

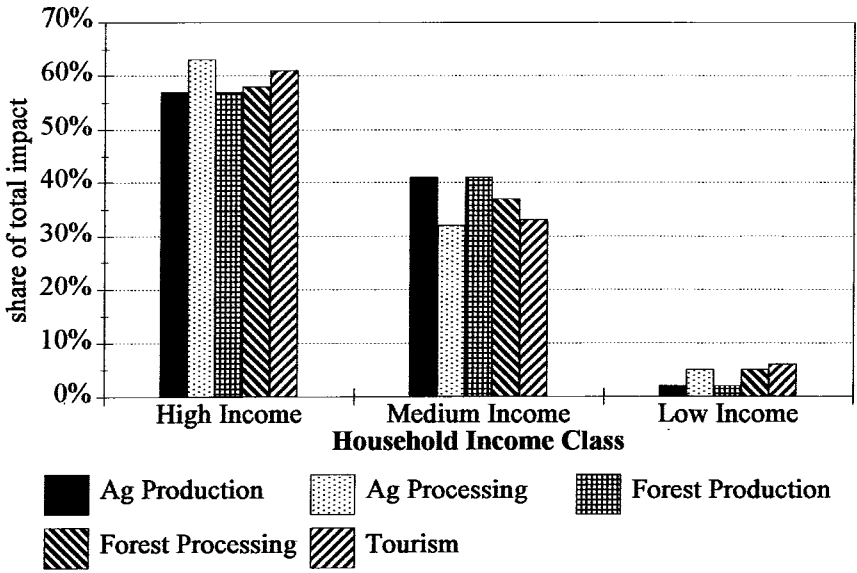
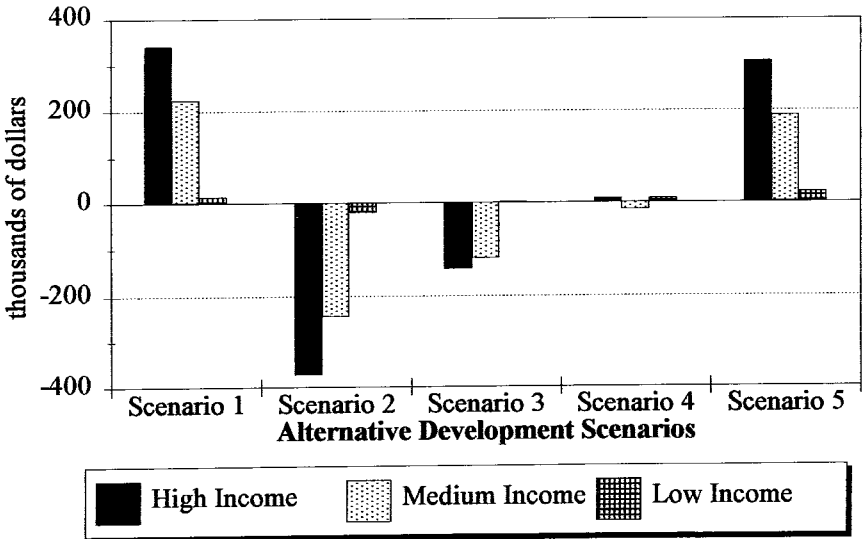


Figure 3. Size of productive activities reflected in actual income distribution impacts to income groups associated with alternative development scenarios in the Kickapoo Valley



Scenario 1 assumes ag. sector increase, other sector decline; Scenario 2 assumes forest sector increase, other sector decline; Scenario 3 assumes tourism sector increase, other sector decline; Scenario 4 assumes forest and tourism sector increase, ag. sector decline; Scenario 5 assumes all sectors increase.

Table 1. Alternative development scenarios of assumed annual percentage change in factor income¹

Production sector	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Agricultural production	+1 percent	-1 percent	-1 percent	-0.5 percent	+0.5 percent
Agricultural processing	+3 percent	-1 percent	-1 percent	-0.5 percent	+0.5 percent
Forestry production	-3 percent	+4 percent	-2 percent	+2 percent	+2 percent
Forestry processing	-1 percent	+2 percent	-1 percent	+1 percent	+1 percent
Tourism	-2 percent	-2 percent	+4 percent	+4 percent	+4 percent

¹ Used to determine both actual and standardized base shocks

Actual base is the existing size of institutional sectors in the Kickapoo Valley

Standardized base equalizes the relative size of shocks to factor income to development sectors

In the Kickapoo Valley the effects of variably sized sectors are clearly seen. In an aggregate sense, changes in the largest sector tend to drive overall economic performance. When considering the disaggregate impacts, only relatively small differences occur either across development scenarios or between income classes. A similar effect would likely be seen in other rural economies dependent on a single sector, e.g., timber, mining, or energy. Under conditions of economic dominance by single sectors, distributional patterns are unlikely to change significantly.

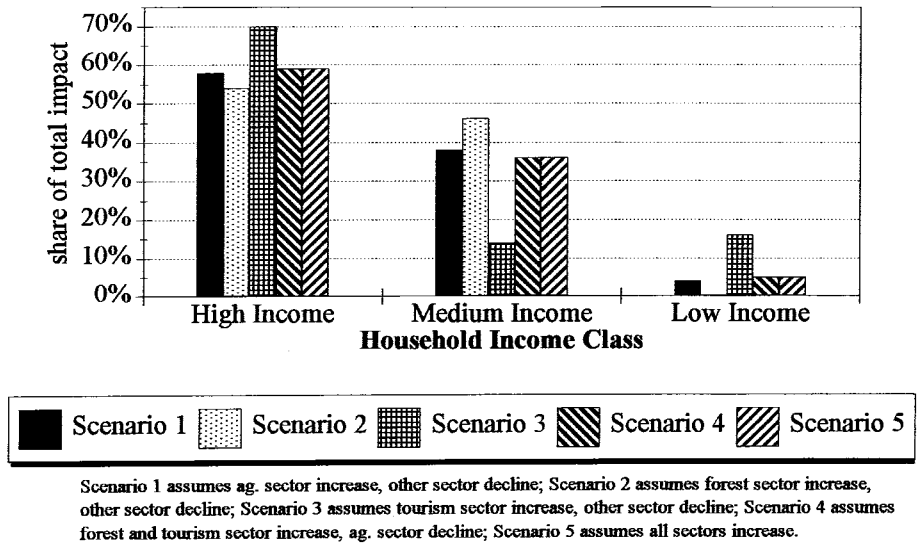
To reduce influence of the size of production sectors on distributional impacts, the exogenous stimuli are standardized by adjusting the relative size of the impact. The same scenario assumptions apply, and a multiplier analysis is used to assess the distributional impacts. Results exhibit proportional changes in Figure 4 after arbitrarily choosing the agricultural processing institution as the base.⁴ The relationships identified under conditions of size inequality generally apply in the standardized scenarios. In Figure 4 a substantial difference is found in scenario 3, where tourism is assumed to increase while other institutions decline. Under these conditions the distribution of impact shifts from the middle income group to the low and high income groups. This tends to emphasize how the middle income class is affected by the production and processing activities and the relatively larger stake low and high income classes have in tourism. This suggests that tourism creates a *hollowing out* of the income distribution.

6. Local policy and income distribution

The ability of local policy to influence distributional patterns is implied to the extent that local action can facilitate variable growth rates of targeted production sectors. In this regard, the SAM shows the differences that exist in strategies promoting the growth of economic sectors generally important to rural regions. In the Kickapoo Valley high and low income households receive their largest relative impacts from changes in processing activities and tourism. Middle income households are most heavily impacted through the raw material production sectors.

⁴ Observing proportional shifts in impact between sectors suggests the "theoretical" potential to variably influence distributional patterns if sectors are more equal in size.

Figure 4. Shift in distribution impact to household income groups associated with alternative development scenarios using a standardized exogenous change to reflect an equalized size of production sectors in Kickapoo Valley



The degree to which local policy can influence distributional patterns is limited. Whereas the differences between income classes are stark, the differences between development strategies are generally modest. An examination of the balanced SAM shows only 3.5 percent of total regional earned income flowed to low income households, suggesting that strategies of targeted sectoral assistance intended to improve prospects for low income households may have limited success.

This does not imply the distributional differences between development strategies are unimportant, however. Relatively modest differences in the distributional percentages between household income groups can make a difference in the rate at which local economic conditions improve or worsen for a given income group. This may be particularly true in light of changes in state and federal income transfer policies. The differences observed here represent averages within the existing economic structure. New projects with targeted benefits may deviate significantly from sectoral averages.

The Kickapoo Valley condition illustrates some of the challenges faced by rural areas dependent on a single economic sector. The dominant sector tends to drive overall economic performance. It becomes difficult to achieve positive net economic performance if the largest sector performs poorly, regardless of how well other sectors perform. Given the relative importance of the region's largest sector, it is understandable there may be inertia or resistance to economic change. This leaves many rural areas in the difficult position of having to use limited local resources to promote the

existing economic base despite potentially declining performance, while also trying to promote new opportunity through economic diversification.

Information related to income distribution can not reduce income disparities or local poverty. Concern related to distributional impacts, however, encourages reexamination of assumptions related to local economic development policy and more careful consideration of the beneficiaries of development assistance. Bringing distributional issues to the policy debate allows the community to make rational choices about its economic future.

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