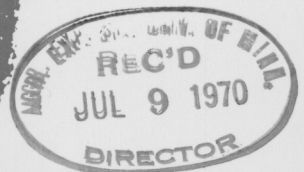
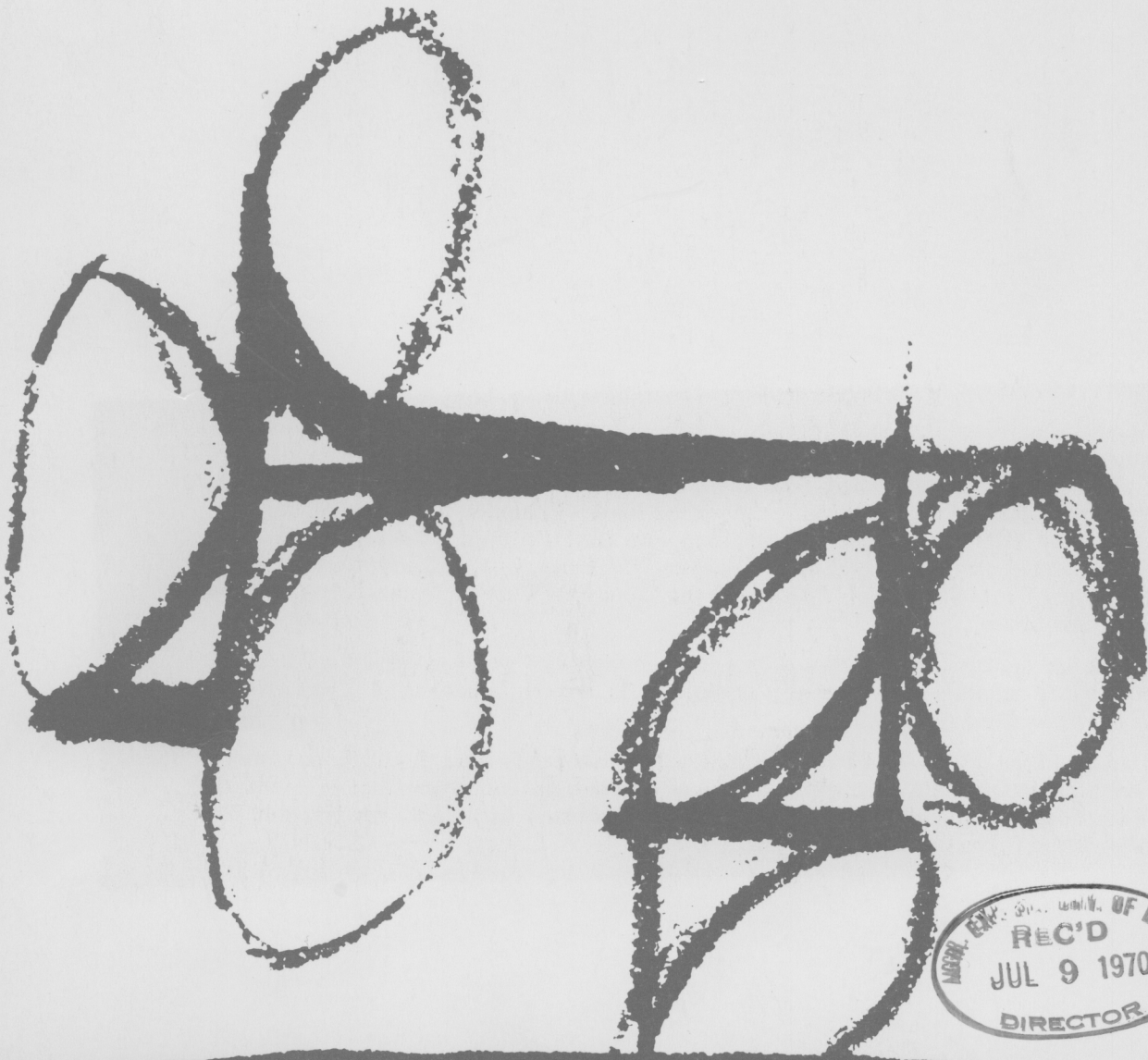


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Forestry in Itasca County's Economy an input-output analysis

Jay M. Hughes



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SUMMARY

The dominant characteristic of Itasca County and, indeed, most areas in northeastern Minnesota is change. Population has declined over the past decade in an apparent response to declining employment opportunities for old and young alike. Employment also has shifted from such basic industries as mining and agriculture to manufacturing and services.

County planners, including businessmen and public officials, need improved tools for measuring the consequences of change in the economy and society if they are to control and respond to these changes effectively. One such tool is an input-output framework that describes the interdependence of activities within the county and the rest of the world. A 39 by 39 sector input-output model of the Itasca County economy of 1966 was constructed, and multipliers useful for estimating shortrun impacts of possible changes were developed from it.

In this analysis, forestry-related sectors such as timber production, saw-milling, and timber operators were given special consideration, since such established activities apparently have room to grow in Itasca County and thereby may represent some opportunities for development. Of added interest is the fact that forestry-related activities in the county have high local community impact multipliers, largely because they result in high local respending of income ratios.

Three basic classes of change are described and examples are developed to illustrate the use of the Itasca County input-output results in measuring the effects of change. The examples include a simple change in sales level as illustrated by timber stumpage sales changes, a change in industry structure with reference to the Itasca County resort sector, and the addition of a new business or sector to the local economy illustrated by the construction of a new chip-and-saw mill in the county. Several other kinds of examples also are developed to help explain the uses and limitations of input-output analysis. All of the cases are drawn in varying degrees from real-life concerns in northeastern Minnesota.

Finally, by means of additional illustrations, guides for using the input-output results are provided. The illustrations point out that high multipliers are not in themselves clear signals for local development. Sales potential also must be evaluated to make effective use of input-output analysis. By illustrating the consequences of land use alternatives, two additional guides are underscored: First, relative uncertainties about alternatives must be considered, and second, income distribution effects as well as level of effect must be taken into account.

FORESTRY IN ITASCA COUNTY: An Input-Output Analysis

Itasca County, Minnesota is resource rich. The western tip of the Mesabi Range iron reserves extends into the county and has yielded over 520 million tons of ore shipments since 1909 (12). Three major watersheds converge in the county: the Mississippi, the St. Lawrence, and Hudson Bay. The county ranks second only to Otter Tail in number of lakes, with 945, and is fourth in the state in terms of lake area (11). The lakes and hundreds of miles of streams and rivers provide habitat for untold numbers of fish and migratory waterfowl as well as sites for hundreds of resort and summer homes. The county's excellent hunting was reflected in a hunter success ratio of nearly 47 percent in 1966 and a harvest of nearly 12,000 deer.¹ In short, Itasca County's outdoor resources provide an amenity package unmatched by many other areas in Minnesota.

The timber resources of the county and economic aspects of their use have been selected for special emphasis in this report. There are nearly 1.5 million acres of commercial forest² in the county, accounting for approximately 83 percent of its land area and making it the most forested county in the state (13). The most recent inventory of the county's timber showed nearly 13.8 million cords of growing stock, containing approximately 2.2 billion board feet of sawtimber. Even though this renewable resource has yielded wood for many products for generations and now provides the raw material for a major sector in the county's economic base, there is room for expanded use. It has been estimated that the forests of Itasca County could yield 300,000 cords of wood more each year than actually were harvested in 1961 (13). This possibility reflects the predominance of relatively young stands of timber that are growing at rates substantially greater than the rates of timber harvest and therefore replacing the timber faster than it is cut. Large acreages and volumes of aspen timber in both pulpwood and sawtimber sizes represent the greatest physical opportunity for expanded timber harvest.

This study, which employs an input-output framework, provides a basis for estimating some of the economic consequences or impacts of changes in the level of activity associated with the timber resources of Itasca County. The overall structure of the Itasca County economy in 1966 is developed. Some timber-related sectors of the economy are given special consideration, and their

interlocking relationships with other sectors of the county economy and the rest of the world are shown. These relationships are then discussed as bases for estimating economic impact.

General Characteristics of The Itasca County Economy

Itasca County has a rich variety of economic activity, including primitive agriculture and industry in the forms of wild rice harvest and the handcrafting of birch-bark canoes, a well-developed service industry catering to tourists, and a highly developed factory industry of tanneries and paper mills. To provide a setting for subsequent discussion, some additional characteristics of the economy are described below.³

Population

The population of Itasca County increased from 33,000 to 38,000 over the period 1940-60. However, population has declined to around 35,000 since then, with projections for the future showing a further decline to the pre-World War II level (6).

Less than 20 percent of the county population is classified as urban, and this portion is concentrated in Grand Rapids, the county's major trading center. Although the rural population of the county has increased somewhat over the past few decades, rural farm population has declined drastically. Most of the households located outside the urbanized area depend upon nonfarm activities for their livelihood.

Employment

County employment hovered around slightly less than 1 percent of total state employment over the 1940-60 period, reflecting trends in total employment in Minnesota. The number of employed ranged from 8,974 in 1940 to 10,845 in 1950 and declined slightly to 10,737 in 1960. Generally, Itasca County probably reflects the slight downturn in total employment forecast for the entire northeastern region of Minnesota over the next decade or so.

¹ From records of the Division of Game, Minnesota Department of Conservation, St. Paul.

² Commercial forestland is land that is presently or potentially capable of producing crops of wood in adequate amounts and quality for use by the wood products industries.

³ Unless otherwise indicated, data in this brief section have been taken from the series *Minnesota Economic Data, Counties and Regions*, prepared from various sources by the Department of Agricultural Economics, the Agricultural Experiment Station, and the Agricultural Extension Service, University of Minnesota, various dates to present, beginning in October 1966.

Agriculture. The apparent downward trend in employment is especially marked in agriculture. Not only has total agricultural employment in Itasca County declined (from 2,433 in 1940 to only 675 in 1960), but it has declined at a much greater rate than agricultural employment for the state as a whole. The decline reduced the county's relative share of the state's agricultural employment from 0.8 percent in 1940 to 0.4 percent in 1960. In 1960, agricultural employment accounted for only a little over 6 percent of all county employment.

Nonagriculture. Conversely, nonagricultural employment has increased both relatively and absolutely in Itasca County over the past few decades. In 1960, the nonagricultural employment of 10,062 accounted for nearly 94 percent of total employment. Distribution of nonagricultural employment by general sector in 1960 was:

	Percent
Manufacturing	11.35
Wholesale and retail trade	17.81
Construction	5.24
Services	58.65
Transportation, communications, and public utilities	6.90

A detailed breakdown of covered employment⁴ by kind of business for the period 1964-67 is shown in table 1, which provides a broad picture of recent nonagricultural employment patterns. Mining clearly is the single most important job source for the people of Itasca County. In 1967, mining's covered employment figure of 1,383 was about 28 percent of all covered employment in the county. Over the preceding 3 years, however, this industry's share was much higher, ranging from 34 to 44 percent of all covered employment. The peak employment year for mining was 1921, when over 5,000 men worked in the industry. Peak production, however, occurred in the war years of the forties and early fifties, when ore shipments ranged from 10 to over 18 million tons per year (12). The extent to which declining employment and production levels in this industry continue will be affected by the ability of the industry to shift to lower grade ores and to taconite processing, which in turn will be affected by the national markets for such ores and the products derived from them.

Forestry as a source of employment is reflected in part in table 1 by logging and sawmilling covered employment. These activities registered a 15 percent decline in covered employment over the 1964-67 period. However, while total employment in mining, for example, is nearly equivalent to covered employment in mining, forestry-related employment is disguised in several of the other categories, such as state and federal government and industry not elsewhere classified (n.e.c.). Federal and state forestry agencies account for a large share of federal and state employment in the county, and industry n.e.c. includes a pulp and paper mill. Furthermore, many

Table 1. Nonagricultural covered employment by kind of business, Itasca County, 1964-67*

Kind of business	1964	1965	1966	1967
Logging and sawmilling	349	342	318	297
Mining	1,812	2,467	2,188	1,383
Food processing	89	71	64	90
Industry n.e.c.†	703	757	831	887
Construction contracting	179	553	1,496	857
Lumber and building materials	95	110	126	128
Automobile sales, services, and supplies, including gasoline	208	223	244	246
Grocery sales	153	160	185	199
Dry goods, furniture, and appliance sales	37	38	41	51
Food and beverage service and sales	174	192	209	178
Recreation n.e.c.†	41	42	58	51
Other retail n.e.c.†	49	51	60	60
Wholesale and other sales n.e.c.†	142	127	133	132
Professional services	87	99	102	129
Finance, real estate, and insurance	99	102	103	95
Electric utilities	65	66	68	72
Communications	75	78	84	91
Transportation and warehousing	16	24	32	35
State government	19	29	51	41
Federal government	26	49	98	106
Total	4,418	5,580	6,491	5,033

* Data provided by Minnesota Department of Employment Security.
† n.e.c. means not elsewhere classified.

workers in forestry-related activities are not covered by unemployment compensation laws within their forestry-related activity and therefore are not reported in table 1 categories. These workers include many of the over 600 individuals in the county who cut wood to sell to timber processors, but who work at this activity for only a short period during the year. Many of these timber cutters also have jobs elsewhere (e.g., in the mines) that are covered by unemployment compensation laws. For these reasons, it is estimated that forestry-related activities as a group rank at least a solid third in Itasca County as an employment source, following mining and contract construction. In fact, contract construction and forestry-related activities apparently may change positions from year-to-year because of the great variability of the contract construction business. In some respects, forestry appears to have the potential to take employment leadership in the county, especially if mining-related activities do not increase.

Wholesale and Retail Trade

By virtue of its location, Grand Rapids serves as a trading center for people living south and west of Itasca County as much as it does for people living within it. Furthermore, out-of-county towns and cities such as Bemidji, Hibbing, and especially Duluth, serve as major trading areas for many Itasca County residents. In other words, the county is by no means independent of adjacent areas.

⁴ Covered employment is that reported by all businesses subject to state and federal unemployment compensation laws. In Minnesota, these are: all firms in townships with a population of 10,000 or more and all firms in townships with less than 10,000 population that employ four or more persons for 20 weeks or more during a year.

Table 2. Pattern of retail sales by class of establishment, Itasca County, 1948 and 1963*

Establishment class	Year		Change, 1948 to 1963
	1948	1963	
	thousand dollars		percent
Apparel	1,177	1,953	+ 65.93
Auto dealers	5,462	6,441	+ 17.92
Drug and proprietary	561	1,082	+ 92.86
Eating and drinking	1,984	2,400	+ 20.97
Foods	7,846	11,838	+ 50.88
Furniture	432	810	+ 87.50
Gasoline stations	1,890	5,056	+167.51
General merchandise	1,884	3,412	+ 81.10
Lumber, building materials, hardware, and farm equipment	3,785	3,199	- 15.48
Other	1,609	3,842	+138.78
Total	26,630	40,033	+ 50.33

* Adapted from U.S. Census of Business.

Table 2 shows the pattern of retail sales in Itasca County in 1948 and 1963. The food group is the clearcut leader in retail sales, followed by auto sales, gasoline, and general merchandising. Of some significance is the fact that while the county ranks only 16th in population, it ranks 10th among all Minnesota counties in gasoline sales and 11th in food sales. These sales sectors are particularly sensitive to purchases of transient visitors and vacationers and reflect in part the county's ties to other areas via recreation travel.

Another measure designed to reflect the above kinds of relationships is equivalent population served (EPS). This measure provides an index of the degree to which local sales exceed the apparent needs of local residents and is calculated as follows:

$$EPS = \frac{\text{Retail sales of goods or service X in county Y}}{\text{Per capita retail sales of goods or service X for state as a whole}}$$

This measure is related to economic base analysis, and sales in excess of the apparent local or county needs might be termed basic or export sales. The 1963 EPS's and apparent excess sales for gasoline and food in Itasca County were:

	1963 EPS	Apparent excess population served
Gasoline	49,569	14,050
Food	43,047	7,438

Wholesale trade in Itasca County reflects county dependence on such areas as Duluth and the Twin Cities.

General Manufacturing

Selected manufacturing data for Itasca County are shown in table 3. Changes from 1939 to 1963 verged on the startling in some respects. Number of establishments nearly tripled and value added by manufacturing in-

creased sevenfold. While total employment increased from 653 to 1,050, employment per establishment declined. This is an interesting trend, inasmuch as a major share of manufacturing employment is accounted for by one establishment, the Blandin Paper Company. The remaining 90 or so establishments are very small.

Agriculture

In 1964, Itasca County had 1,041 farm units, according to the U.S. Census of Agriculture. This was about one-third the number of farms in the county in 1939, although average farm size almost doubled over this period, from 85.9 to 160.3 acres. Farmland accounts for a little less than 10 percent of the total land area of the county.

Total value of all farm products in Itasca County in 1964 was estimated at \$2.4 million, which was more than double the value in 1939, but accounted for only 0.18 percent of the 1964 state total. About two-thirds, or \$1,758,000 of these farm sales were livestock and livestock products. Various crops such as potatoes and hay made up the remainder of farm products. Average sales per farm were \$2,316 in 1964.

There were 767 full owners of these 1,041 farms in 1964; however, there were nearly as many farm operators (746) who also worked off their farms. In total, there were 974 farm households that derived over \$3.3 million income from nonfarm sources in Itasca County in 1964. Nearly \$2.8 million was in wage and salary payments from various activities, especially work in the mines of Itasca and adjacent counties.

Nonagricultural Wages

Another index of the relative importance of kinds of business in a local economy is wages paid. Table 4 shows that the mining industry is consistently the leading source of wage payments for the county, followed by other industry n.e.c., which again is dominated by a single firm, the Blandin Paper Company. New highway construction and the construction of a taconite processing plant ac-

Table 3. General manufacturing data, Itasca County, 1939-63*

Item	Year		Change, 1939 to 1963
	1939	1963	
Number of establishments	32	91	+184.4
Value added (thousand dollars)	1,324	10,437	+688.3
Number of employees	653	1,050	+ 60.8
Employment per establishment	20.4	11.5	- 43.6
Number of production workers	524	865	+ 39.4
Production workers per establishment	16.4	9.5	- 42.1
Value added per establishment (thousand dollars)	41.8	114.7	+174.4
Value added per employee (thousand dollars)	2.0	9.9	+395.0
Value added per production worker (thousand dollars)	2.5	11.9	+376.0

* Source: Minnesota Economic Data, Counties and Regions, No. 12, "Manufacturing," June 1968.

counted for the substantial jump in wages paid in the construction industry in recent years. Logging and sawmilling have declined in importance as sources of wage payments. Again, however, as with covered employment, forestry-related activities are strongly represented in state and federal wage payments in the county.

The Itasca County Input-Output Framework

The General Model

Regional input-output studies are now legion. Bourque and Hansen recently reported on 86 studies completed or underway since 1952, and their inventory was admittedly incomplete (2). This extensive experience suggests that the general approach of interindustry relations or input-output analysis is well-developed and largely well-accepted as a means of measuring interstructural relationships of a less-than-national economy. Differences among studies are mainly differences in data gathering methods and business aggregations. These in turn reflect differences in study purposes.

Many excellent references on input-output analysis are available (3, 4, 5, 8, 9, 10). Therefore, only the basic format and terminology of input-output results are discussed here. Table 5, which uses Itasca County data, is called a transaction matrix and shows, reading down a column, the dollar values of purchases made by that grouping of industry, business, or service establishments and firms that make up a sector. The kinds of firms grouped together in a sector are at least somewhat similar in terms of activity function within the economy being studied. Each sector purchases goods and services from other sectors within its local economy, as well as from outside sectors to enable it to sell its own goods and services. In table 5, sector 1, which includes in this case timber growing, timber harvesting, and sawmilling, pur-

Table 4. Nonagricultural covered wages by kinds of business, Itasca County, 1964-67*

Kind of business	1964	1965	1966	1967
thousand dollars				
Logging and sawmilling	1,114	1,049	1,025	1,048
Mining	11,966	17,703	16,334	9,866
Food processing	384	321	300	409
Industry n.e.c.†	4,387	4,527	5,185	7,392
Construction contracting	894	3,790	12,939	7,282
Lumber and building materials	400	429	511	520
Automotive sales, services, and supplies, including gasoline	930	1,009	1,155	1,237
Grocery sales	589	624	683	699
Dry goods, furniture, and appliance sales	181	168	213	240
Food and beverage service and sales	308	369	424	406
Recreation n.e.c.†	98	87	139	102
Other retail n.e.c.†	201	212	243	259
Wholesale and other sales n.e.c.†	428	390	415	417
Professional services	457	664	509	589
Finance, real estate, and insurance	479	530	589	605
Electric utilities	412	432	481	418
Communications	374	414	454	496
Transportation and warehousing	71	100	148	158
State government	99	160	324	276
Federal government	154	293	591	646
Total	25,926	33,271	42,712	33,065

* Data provided by Minnesota Department of Employment Security.
† n.e.c. means not elsewhere classified.

chased \$7,364,000 of goods and services outside the county. Sector 9 includes all sectors outside the local economy. Note also that sector 1 makes purchases from itself in this case, reflecting intrasectoral transactions that result from including interrelated businesses in the same sector; e.g., log producers and log processors.

Sector 7, the households sector, represents wages, salaries, profits, and rents paid to individual householders for their services as laborers, managers, and investors in various activities. In this study, therefore, local house-

Table 5. Simplified transaction matrix for Itasca County, 1966

Producing sector number	Sector purchasing								All internal	All external	Total
	Forest industries, excluding pulp and paper manufacture (1)	Mining, pulp and paper manufacture, printing, and other industry (2)	Service industries and non-profit organizations (3)	Construction contracting, utilities, and light industry (4)	Retail and wholesale sales (5)	Local government and public schools (6)	Households (7)	Overflow/depletion (8)			
thousand dollars											
1	1,146	2,020	0	259	195	1	78	68	3,767	4,976	8,743
2	20	195	257	434	175	70	14	1,676	2,841	56,631	59,472
3	1,235	1,575	2,344	1,159	1,711	1,713	15,387	207	25,331	10,621	35,952
4	326	137	2,763	1,532	1,261	1,352	5,856	72	13,299	6,773	20,072
5	1,027	444	6,499	1,775	973	981	30,783	1,102	43,584	9,964	53,548
6	203	1,810	709	729	373	9,281	4,861	0	17,966	14,524	32,490
7	3,372	10,048	13,560	7,589	5,292	11,587	193	0	51,641	29,410	81,051
8	35	18	6	33	0	914	2,841	0	3,847	0	3,847
Total internal	7,364	16,247	26,138	13,510	9,980	25,899	60,013	3,125	162,276	0	162,276
Total external	1,379	43,225	9,814	6,562	43,568	6,591	21,038	722	0	132,899	132,899
Total	8,743	59,472	35,952	20,072	53,548	32,490	81,051	3,847	162,276	132,899	295,175

holds are treated as a local or endogenous producing sector rather than as an external or exogenous consuming sector. This treatment reflects more clearly the role households play as producers as well as consumers when changes occur in the size and makeup of a local economy.

Sector 8, overflow/depletion, is a balancing sector reflecting the current cash flows required by several sectors to make their annual incomes match annual expenditures. In a sense, these are investments from external sources in local business.

Row entries in table 5 represent sales by the row heading sector to internal and external sectors. For example, sector 1 sold \$3,767,000 worth of its products to other sectors (including itself) inside Itasca County and \$4,976,000 worth outside the county. Note that the column total for sector 1, \$8,743,000, is equal to the row total for sector 1. In fact, the column and row totals for every sector (and note that there are an equal number of rows and columns in this model, creating a square matrix) are equal and, therefore, the sums of row and column totals are equal. The reason is that current annual cash expenditures shown must be balanced by a like amount of cash receipts either from sales, accrued receipts, savings, or investments by others. Unspent receipts (or sales in excess of expenses) are converted into savings or investments elsewhere.

Table 6 contains the technical coefficients based on the dollar flows of table 5. Note that the coefficients in each column add up to 1. These coefficients are calculated by dividing any entry in a column by the total sales for the column heading sector. For example, sector 1 purchased \$3,372,000 worth of household services, while making total sales of \$8,743,000. The technical coefficient at the intersection of column sector 1 and row sector 7 is therefore $\$3,372,000 \div \$8,743,000$, or 0.386. Therefore, we assume that for every \$1 of sales by sector 1, sector 1 purchases nearly 39 cents of sector 7 services. The tech-

nical coefficients thus show the pattern of respending of receipts by each sector, or the first round of impact associated with activity in the local economy.

The direct impact of sales by a local sector sets off a chain reaction or series of impacts throughout the local economy. A first round is the initial respending of sales dollars and is measured by the technical coefficients. Each sector receiving first round respending dollars must, in turn, respense these dollars according to its own respending pattern, as shown by its own set of technical coefficients. The respending process is repeated again and again as long as any of the original sales dollars are left in the local economy. The sum of all local respending of the sales dollar is the direct-plus-indirect or inverse coefficient. Table 7 shows the direct-plus-indirect coefficients and multipliers for this illustrative internal sector Itasca County model. The sum of the direct-plus-indirect coefficients for a given column is known as the local community multiplier for that column. Thus, for every \$1 of sales by sector 1, \$3.12 of total sales (including the \$1 initial sales) occurs within the local economy. Note that sector 7 receives 74 cents of income for every \$1 of sales by sector 1, directly and indirectly. However, according to the technical coefficients of table 6, sector 7 receives only 39 cents for the same \$1 of sales. Thus, because of all other activity in the local economy resulting from sector 1 activities to make \$1 in sales, and because of the necessary purchases of sector 7 services to carry out other associated activities, sector 7 receives indirectly (with respect to sector 1 sales) an additional 35 cents.

Generally, as might be surmised from the foregoing discussion, the greater the proportion of sales dollars respent within the local economy, the greater is the direct-plus-indirect coefficient for a sector. If, therefore, an economy were completely closed; i.e., no goods, services, or exchange units such as money could enter or leave, and were self-sufficient, the community multipliers

Table 6. Simplified technical coefficient matrix for Itasca County, 1966

Producing sector number	Sector purchasing										
	Forest industries, excluding pulp and paper manufacture (1)	Mining, pulp and paper manufacture, printing, and other industry (2)	Service industries and non-profit organizations (3)	Construction contracting, utilities, and light industry (4)	Retail and wholesale sales (5)	Local government and public schools (6)	Households (7)	Overflow/depletion (8)	All internal	All external	Total
1	0.131	0.034	0.000	0.012	0.004	0.000	0.001	0.018	0.023	0.037	0.030
2	0.002	0.003	0.007	0.022	0.003	0.002	0.000	0.436	0.018	0.426	0.201
3	0.141	0.026	0.065	0.058	0.032	0.053	0.190	0.054	0.156	0.080	0.122
4	0.037	0.002	0.077	0.076	0.024	0.042	0.072	0.019	0.082	0.051	0.068
5	0.117	0.007	0.181	0.088	0.018	0.030	0.380	0.286	0.269	0.075	0.181
6	0.023	0.030	0.020	0.036	0.007	0.286	0.060	0.000	0.111	0.109	0.110
7	0.386	0.169	0.377	0.378	0.099	0.357	0.002	0.000	0.318	0.221	0.275
8	0.004	0.000	0.000	0.002	0.000	0.028	0.035	0.000	0.024	0.000	0.013
Total internal	0.842	0.273	0.727	0.673	0.186	0.797	0.740	0.812	1.000	0.000	.....
Total external	0.158	0.727	0.273	0.327	0.814	0.203	0.260	0.188	.....	1.000	.....
Total	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.....	.....	1.000

Table 7. Simplified direct-plus-indirect coefficient matrix for Itasca County, 1966

Producing sector number	Sector purchasing							
	Forest industries, excluding pulp and paper manufacture (1)	Mining, pulp and paper manufacture, printing, and other industry (2)	Service industries and non-profit organizations (3)	Construction contracting, utilities, and light industry (4)	Retail and wholesale sales (5)	Local government and public schools (6)	Households (7)	Overflow/depletion (8)
1	1.158	0.041	0.007	0.022	0.006	0.008	0.008	0.041
2	0.028	1.011	0.025	0.041	0.009	0.040	0.029	0.446
3	0.363	0.106	1.232	0.227	0.080	0.265	0.303	0.146
4	0.155	0.043	0.169	1.168	0.050	0.159	0.148	0.067
5	0.521	0.152	0.494	0.405	1.109	0.417	0.586	0.427
6	0.124	0.075	0.101	0.125	0.031	1.484	0.131	0.051
7	0.744	0.285	0.622	0.629	0.174	0.742	1.286	0.232
8	0.036	0.013	0.025	0.028	0.007	0.068	0.049	1.010
Total	3.126	1.726	2.676	2.643	1.465	3.182	2.540	2.420

would be infinitely large. This relationship will be discussed later.

The Itasca County Input-Output Model and Methods

The Itasca County input-output model and study methods closely parallel those employed by Gamble and Raphael in Clinton County, Pennsylvania (4). Interestingly, the two counties are very similar in some respects, such as total level of economic activity, certain kinds of economic activity such as mining and pulp and paper manufacture, and spatial separation from major market and population centers. Consequently, some of the coefficients resulting from the two studies are quite similar.

Complete lists of businesses, industries, and household and governmental units within the county were compiled from various sources. Thirty-nine sectors, 35 of which were within county producing sectors or endogenous, eventually were delineated for analysis in a square matrix. Data for the base year of 1966 were obtained mainly by a questionnaire survey of a sample of establishments (as opposed to firms)⁵ within each business sector and a sample of households. Nearly 800 interviews, about evenly divided between households and all other sectors provided most of the data. The questionnaires appear in appendix B. Secondary data as well as estimated sales totals from sample data were used as control totals for constructing and balancing the transaction matrix.

The 39 sectors and their component kinds of business are listed in appendix A. The first three sectors—timber production, timber operators, and sawmills—required special emphasis in data gathering, since these three activities often were not separated from each other or other activities in the accounts of establishments sampled. However, because the intent of the study was to give

special consideration to such forestry-related sectors, mutually exclusive accounts for these activities were developed with the assistance of respondents. Other multiple enterprise establishments were classified according to the activity that yielded the largest annual sales.

Some disclosure problems did arise. Consequently, a variety of kinds of establishments were lumped together in the other industry n.e.c. sector. Included here were mining, pulp and paper manufacture, and printing and publishing.

As in the Clinton County study, local households were included as an endogenous producing sector rather than as a separate sector in final demand. Unlike the Clinton County study, however, the separate categories of household income; i.e., labor, rent, transfer, and proprietary, were not broken out. Also, as in the Clinton County study, an overflow row and a depletion column were included as balancing accounts to make the current money flows of the economy balance. These accounts reflect external investment in the local economy in the case of sector deficits and local origin investments in the case of sector surpluses.

The Forestry Focus

In a period of transition from dependence upon mining as an economic base activity to an increasing reliance on other resource and locational attributes, Itasca County offers economic opportunities in forestry. Its timber and associated amenity packages of water and woodlands offer some alternative possibilities for future development. Furthermore, these resources are readily accessible by means of good highway systems and represent both destination and enroute opportunities for the footloose recreationist.

⁵ There are many multiple establishment firms such as oil companies, beverage distributors, insurance companies, and sundry stores operating in Itasca County. Generally, the establishment unit rather than the firm as a whole is the operating unit and the appropriate sample unit to represent its kind of activity within a sector.

Itasca is not only Minnesota's third largest county, it also is the most forested county in the state. Over 83 percent of its land area is occupied by commercial forests (13). It has had a timber industry for many years, but opportunity for expansion does exist. In 1961, it was estimated that an additional annual harvest of 300,000 cords of wood was possible, based upon actual harvest rates and the harvest rate required to utilize forest growth and maintain vigorous forest stands.

Another characteristic of Itasca County is that the institutional framework for forestry-related activities is extremely varied, providing an opportunity for analysis not generally available elsewhere. The forest resource is owned and administered by federal, state, and county governmental agencies, as well as by large forest industry landowners and small landowners. Furthermore, more than one segment of the wood products industry depends upon the timber from its forests: Sawlogs are cut for lumber manufacture; pulpwood is cut to supply the local pulp mill, as well as mills in adjacent counties; and other products, including poles, posts, piling, and some veneer logs, are harvested.

Finally, even though the county has depended heavily upon mining in the past, it supports a wide range of other economic activities. Forestry-related sectors therefore interact with a variety of other sectors in a relatively small area. Furthermore, the county's ties with adjacent areas are well developed, which provides opportunity for measuring its sensitivity to changes in economic activity elsewhere.

General Input-Output Results

Appendix C contains the complete 39 sector set of basic input-output matrices. Portions of them also are included here as tables 8-10.

Dollar Value of Sales and Expenditures: Transaction Matrix

Table 8 shows the column or expenditure transaction data for timber production, timber operators, sawmills, other industry n.e.c., and households. Total sales generated by the economy internally and externally also are shown. The table is self-explanatory, with producer's sector sales read across a row and purchasing sector expenditures read down a column. In Itasca County, sector 7 (other industry n.e.c.) clearly is the most important internal sector source of income for households. Mining and the paper mill in Grand Rapids figure prominently. Also, because many people who live in Itasca County work in mines just outside the county, mining payrolls play an important role in accounting for the large payments to households (sector 34) by external sector 39 (all other external). Overall, activities in Itasca County in 1966 generated \$162 million in sales internally and \$133 million externally, for a total of \$295 million.

The timber production (in the sense of growing and maintaining an inventory of standing timber) sector's

sales of \$680,000 (mainly stumpage) were about evenly divided between purchasers inside and outside the county. Outside county sales reflect the dependence on local timber resources of many timber operators who live just outside the county. Furthermore, direct stumpage purchases made by log using industries within the county are very slight. In terms of expenditures by sector 1, most are made locally to the household sector in the form of wages and salaries, as might be expected.

Timber operator intrasector sales of \$450,000 are explained by sales of logs to other timber operators and middlemen who in turn sell to log processors. Intrasector sales were just matched by log sales to the sawmill sector. By far the most important market for cut wood within the county is direct sale to the pulp mill at Grand Rapids, which amounted to almost \$2 million in 1966. Even greater are sales (\$3.1 million in 1966) to log buyers and processors outside the county. Out-of-county purchasers include three pulp mills. Timber operator expenditures, like those of timber growers, are concentrated largely within the local economy and somewhat less so in the household sector.

Sector 7 (other industry n.e.c.) represents the large, capital-intensive industries of the county. Sales are made predominantly outside the county, and external expenditures are almost three times those within the local economy. Hence, the multiplier effect of sector 7 will be low compared with timber growing and timber operators. As a general rule, the greater the proportion of total expenditures made locally, the greater is the multiplier effect. Nevertheless, because sector 7 industries are so large compared with other industries in the county, local impacts also are large. This is reflected in the fact that sector 7 yields the largest amount of household income.

Finally, a household consumption function is represented by sector 34. The consumption function shows how residents of Itasca County spent their incomes in 1966. A minor amount of unincorporated business activity is reflected here, although most expenditures were for personal consumption. Food and drug purchases were the leading expenditure items, followed at a considerable distance by automobile sales and supplies; finance, real estate, and insurance sales; and dry goods, appliances, and other household goods. Locally purchased food, shelter, clothing, and transportation items accounted for about 40 percent of the average household budget. Residents also spent additional amounts for these items outside the county.

Direct Impacts: Technical Coefficient Matrix

Table 9 gives the technical coefficients for the same sectors shown in table 5. Again, these numbers are additive down a column but not across a row and are interpreted both as percentages in decimal form and as the input expenditure needed to make a dollar's worth of product or service. Because total expenditures and income for any sector are equal, the column coefficients add up to 1.

Table 8. Partial transaction matrix, Itasca County, 1966

Producing sector number*	Sector purchasing					Total internal	Total external	Total
	Timber production (1)	Timber operators (2)	Sawmills (3)	Other industry n.e.c.† (7)	Households (34)			
	thousand dollars							
1	0	246	0	89	0	335	345	680
2	0	450	450	1,921	0	2,821	3,153	5,974
3	0	0	0	10	78	611	1,478	2,089
4	0	0	0	0	0	253	4,136	4,389
5	0	0	0	0	403	1,080	630	1,710
6	1	0	0	0	194	660	744	1,404
7	1	1	18	195	14	2,841	56,631	59,472
8	5	9	48	61	1,530	4,500	362	4,862
9	0	417	8	1,405	216	3,063	503	3,566
10	3	20	16	56	1,357	2,629	595	3,224
11	4	598	164	76	6,074	8,463	1,412	9,875
12	2	263	111	12	2,766	3,788	1,935	5,723
13	4	177	45	4	1,071	2,300	367	2,667
14	0	6	3	80	15,773	17,442	2,231	19,673
15	1	4	25	73	5,131	5,763	2,199	7,962
16	0	0	0	0	2,623	2,635	1,538	4,173
17	1	6	6	112	267	739	143	882
18	1	3	0	17	2,233	2,835	850	3,685
19	1	1	10	13	598	1,181	113	1,294
20	0	258	143	63	5,248	9,398	1,819	11,217
21	3	11	0	0	0	68	809	877
22	2	0	11	10	1,624	2,310	421	2,731
23	2	4	18	62	1,034	2,196	113	2,309
24	3	158	9	47	2,181	8,548	3,384	11,932
25	0	0	0	0	125	217	1,571	1,788
26	0	0	0	0	1,075	1,150	1,319	2,469
27	0	0	0	0	132	140	208	348
28	0	1	2	65	503	996	164	1,160
29	0	0	0	0	122	7,694	2,572	10,266
30	0	0	0	4	1,454	3,495	452	3,947
31	146	20	37	1,801	3,153	6,612	9,808	16,420
32	0	0	0	0	0	4	332	336
33	0	0	0	5	0	21	1,152	1,173
34	431	2,335	606	10,048	193	51,641	29,410	81,051
35	0	35	0	18	2,841	3,847	0	3,847
Total internal	611	5,023	1,736	16,247	60,013	.....	.....	.....
36	0	0	0	1,319	769	.....	.....	.....
37	10	42	25	1,561	1,987	.....	.....	.....
38	59	73	60	3,049	5,960	.....	.....	.....
39	0	836	274	37,296	12,322	.....	.....	.....
Total external	69	951	359	43,225	21,038	.....	.....	.....
Total	680	5,974	2,089	59,472	81,051	162,276	132,899	295,175

* See appendix A for sector description.

† n.e.c. means not elsewhere classified.

Technical coefficients provide a convenient way to express direct impact relationships of the transaction matrix. Timber production (sector 1) again shows as labor intensive, with local households receiving 63 percent of every dollar of sales. Timber operators and sawmills spend 39 and 29 percent, respectively, of every dollar of income in the local household sector, whereas other industry n.e.c. spends 17 cents out of every dollar for local household services.

The relationships between inside and outside county expenditures also are clearly shown by the technical coefficients. For example, other industry n.e.c. spends 73 cents out of every dollar for goods and services outside

of Itasca County. On the other hand, the timber production sector only spends 10 cents out of every dollar outside the county.

The distinction between inside and outside county expenditures shown by the technical coefficients is somewhat misleading. Although sector 1, for example, can purchase most of its inputs from within Itasca County and is therefore not input dependent upon the rest of the world, it is quite dependent upon the rest of the world for sales. As shown in table 8, over half of sector 1's sales are outside the county. Furthermore, sector 7 is neither input nor sales dependent upon Itasca County. Nevertheless, the industries of that sector are in Itasca

Table 9. Technical coefficients for selected sectors, Itasca County, 1966

Producing sector number*	Sector purchasing							Total
	Timber production (1)	Timber operators (2)	Sawmills (3)	Other industry n.e.c.† (7)	Households (34)	Total internal	Total external	
1	0.0	0.04118	0.0	0.00150	0.0	0.00206	0.00260	0.00230
2	0.0	0.07533	0.21541	0.03230	0.0	0.01738	0.02372	0.02024
3	0.0	0.0	0.0	0.00017	0.00096	0.00377	0.01112	0.00708
4	0.0	0.0	0.0	0.0	0.0	0.00156	0.03112	0.01487
5	0.0	0.0	0.0	0.0	0.00497	0.00666	0.00474	0.00579
6	0.00147	0.0	0.0	0.0	0.00239	0.00407	0.00560	0.00476
7	0.00147	0.00017	0.00862	0.00328	0.00017	0.01751	0.42612	0.20148
8	0.00735	0.00151	0.02298	0.00103	0.01888	0.02773	0.00272	0.01647
9	0.0	0.06980	0.00383	0.02362	0.00266	0.01888	0.00378	0.01208
10	0.00441	0.00335	0.00766	0.00094	0.01674	0.01620	0.00448	0.01092
11	0.00588	0.10010	0.07851	0.00128	0.07494	0.05215	0.01062	0.03345
12	0.00294	0.04402	0.05314	0.00020	0.03413	0.02334	0.01456	0.01939
13	0.00588	0.02963	0.02154	0.00007	0.01321	0.01417	0.00276	0.00904
14	0.0	0.00100	0.00144	0.00135	0.19461	0.10748	0.01679	0.06665
15	0.00147	0.00067	0.01197	0.00123	0.06331	0.03551	0.01655	0.02697
16	0.0	0.0	0.0	0.0	0.03236	0.01624	0.01157	0.01414
17	0.00147	0.00100	0.00287	0.00188	0.00329	0.00455	0.00108	0.00299
18	0.00147	0.00050	0.0	0.00029	0.02755	0.01747	0.00640	0.01248
19	0.00147	0.00017	0.00479	0.00022	0.00738	0.00728	0.00085	0.00438
20	0.0	0.04319	0.06845	0.00106	0.06475	0.05791	0.01369	0.03800
21	0.00441	0.00184	0.0	0.0	0.0	0.00042	0.00609	0.00297
22	0.00294	0.0	0.00527	0.00017	0.02004	0.01424	0.00317	0.00925
23	0.00294	0.00067	0.00862	0.00104	0.01276	0.01353	0.00085	0.00782
24	0.00441	0.02645	0.00431	0.00079	0.02691	0.05268	0.02546	0.04042
25	0.0	0.0	0.0	0.0	0.00154	0.00134	0.01182	0.00606
26	0.0	0.0	0.0	0.0	0.01326	0.00709	0.00992	0.00836
27	0.0	0.0	0.0	0.0	0.00163	0.00086	0.00157	0.00118
28	0.0	0.00017	0.00096	0.00109	0.00621	0.00614	0.00123	0.00393
29	0.0	0.0	0.0	0.0	0.00151	0.04741	0.01935	0.03478
30	0.0	0.0	0.0	0.00007	0.01794	0.02154	0.00340	0.01337
31	0.21471	0.00335	0.01771	0.03028	0.03890	0.04075	0.07380	0.05563
32	0.0	0.0	0.0	0.0	0.0	0.00002	0.00250	0.00114
33	0.0	0.0	0.0	0.00008	0.0	0.00013	0.00967	0.00397
34	0.63382	0.39086	0.29009	0.16895	0.00238	0.31823	0.22130	0.27459
35	0.0	0.00586	0.0	0.00030	0.03505	0.02371	0.0	0.01303
Total internal	0.89853	0.84081	0.82815	0.27319	0.74044	.....	.....	.....
36	0.0	0.0	0.0	0.02218	0.00949	.....	.....	.....
37	0.01471	0.00703	0.01197	0.02625	0.02452	.....	.....	.....
38	0.08676	0.01222	0.02872	0.05127	0.07353	.....	.....	.....
39	0.0	0.13994	0.13116	0.62712	0.15203	.....	.....	.....
Total external	0.10147	0.15919	0.17185	0.72681	0.25956	.....	.....	.....
Total	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

* See appendix A for sector description.
 † n.e.c. means not elsewhere classified.

County partly because the critical resources, ore, timber, and water, are there and are made economically viable by means of good transportation links to the rest of the world.

Multiplier Impacts: Direct-Plus-Indirect Coefficient Matrix

The direct-plus-indirect coefficients of table 10 are the most useful results of an input-output study. They measure the combined direct and indirect effects upon a local economy of sales by a sector; that is, they measure not only the total amount of sales by a given sector, but also all of the associated and indirect business activity occasioned by the sales. As pointed out above, by adding up the coefficients within any column, the total local

community multiplier for a dollar's worth of sales by the column heading sector is obtained.

Thus, for every dollar of sales by the timber production sector in Itasca County in 1966, a total of \$3.45 of local business activity occurred. This \$3.45 includes the original \$1 of sales. Consequently, \$2.45 of additional sales were made by other sectors within the county economy. In table 9, the direct effect or impact on Itasca County of \$1 of sales by timber production is shown to be only 90 cents of direct local responding by sector 1 plus the \$1 of sales by sector 1. The indirect effect or impact would thus be the local community multiplier of \$3.45 less the direct sales effect of \$1 and less the direct responding of the 90 cents by sector 1. This amounts to \$1.55. However, it is customary to refer to the indirect

effect as the local community multiplier less the \$1 of sales by the sector of interest. In the case of Itasca County's timber production sector, this would be \$2.45.

The individual coefficients for each sector within a column also show the same indirect or multiplier effect. For example, households are shown in table 10 to have received about \$1 as a result of \$1 of sales by timber production. However, table 9 shows that households received directly from timber production only 63 cents for the average \$1 of sales in 1966. Thus, the indirect effect upon households amounted to 37 cents. This occurred as a result of household sales to other sectors such as gasoline and service stations, which had to purchase household services; i.e., employ people, in order to make the sales to timber production and to other sectors that support \$1 of sales by timber production.

A brief example will clarify the mechanics of the multiplier effect measured by the direct-plus-indirect coefficients. Suppose a family from Chicago spent a 2-week

vacation at one of Itasca County's numerous resorts. And suppose that the family's spending pattern for that week was:

Housekeeping cabin rental	\$150
Grocery and sundry purchases	80
Boat rental from resort	12
Lures and bait purchased from resort	20
Minor clothing purchases in nearby town	30
Gas and oil for automobile	24
Fishing licenses	36
Total	\$352

Of this total, \$182 was paid directly to the resort operator. The resort operator in turn responds this money, including payments to employees and, ultimately and hopefully, also to himself as a household receiving payment for the sale of his managerial services. Using the coefficients of appendix table 2, the average pattern of respending of this \$182 by the average resort owner in Itasca County in 1966 would have been:

Table 10. Direct-plus-indirect coefficients, selected sectors, Itasca County, 1966

Producing sector number*	Timber production (1)	Timber operators (2)	Sawmills (3)	Other industry n.e.c.† (7)	Households (34)
1	1.00014	0.04463	0.00972	0.00298	0.00013
2	0.00231	1.08306	0.23505	0.03568	0.00228
3	0.00579	0.00390	1.00503	0.00168	0.00575
4	0.0	0.0	0.0	0.0	0.0
5	0.01204	0.00811	0.00784	0.00336	0.01414
6	0.00814	0.00412	0.00549	0.00168	0.00655
7	0.02760	0.01966	0.02620	1.01024	0.02681
8	0.05493	0.03195	0.05530	0.01346	0.04683
9	0.01272	0.08462	0.02926	0.02926	0.01072
10	0.03158	0.02300	0.02940	0.00848	0.03095
11	0.09420	0.17432	0.16673	0.02946	0.10896
12	0.04282	0.07710	0.09185	0.01305	0.04914
13	0.02707	0.05210	0.04927	0.00710	0.02457
14	0.21272	0.15189	0.14392	0.06043	0.26656
15	0.06970	0.04883	0.05810	0.02018	0.08495
16	0.03265	0.02321	0.02198	0.00912	0.04175
17	0.00804	0.00603	0.00818	0.00371	0.00742
18	0.03597	0.02363	0.02245	0.00949	0.03929
19	0.01389	0.00939	0.01389	0.00368	0.01467
20	0.09851	0.11657	0.14904	0.02937	0.11169
21	0.00482	0.00237	0.00065	0.00017	0.00030
22	0.02850	0.01832	0.02321	0.00723	0.03090
23	0.02516	0.01796	0.02603	0.00726	0.02618
24	0.07880	0.10712	0.09616	0.02262	0.08522
25	0.00268	0.00192	0.00172	0.00073	0.00315
26	0.01381	0.00965	0.00915	0.00382	0.01731
27	0.00164	0.00117	0.00110	0.00046	0.00210
28	0.01009	0.00800	0.00920	0.00388	0.01173
29	0.12381	0.02477	0.02780	0.02132	0.03031
30	0.04789	0.02070	0.02136	0.01059	0.03381
31	0.26568	0.05144	0.05816	0.04540	0.06159
32	0.00004	0.00001	0.00002	0.00001	0.00002
33	0.00023	0.00007	0.00008	0.00013	0.00010
34	1.00610	0.71542	0.67745	0.28101	1.28681
35	0.04699	0.03417	0.02821	0.01246	0.04876
Total	3.44709	2.99919	3.10898	1.70950	2.53146

* See appendix A for sector description.
† n.e.c. means not elsewhere classified.

Inside Itasca County	
Printing, publishing, and other industry	\$ 3.05
Construction contracting	10.69
Lumber, building materials, and hardware	10.79
Auto and equipment sales	4.07
Gasoline and service	5.19
Auto and machinery repair	1.22
Grocery, drug, and sundry	10.99
Dry goods, appliances, and furniture	8.14
Other retail n.e.c.†	1.32
Professional services	1.12
Skilled trade and services	3.46
Finance, real estate, and insurance	18.12
Electric utilities	7.12
Communications	5.39
Wholesale and distributing	20.97
Recreation and entertainment	3.36
Nonprofit organizations	1.22
County government	10.79
Wages, salaries, rents, and profits	17.91
All other inside	0.20
Total inside	\$145.12*
Outside Itasca County	
Wages, salaries, rents, and profits	\$ 4.17
State government	8.45
Federal government	7.43
All other outside	16.79
Total outside	\$ 36.84*

* Totals do not add up to \$182 due to rounding during multiplication by technical coefficients.
† n.e.c. means not elsewhere classified.

As shown above, about 80 percent (\$145.12) of the \$182 received by the resort from the Chicago vacationers was respent in Itasca County by the resort operator. Thus, at this round of spending, \$182 plus \$145.12 or \$327.12 of

new business had occurred in Itasca County as a result of the Chicago family's spending at the resort alone. Each of the recipients of the resort's expenditures also has a pattern of respending the money both within and outside the county. Successive rounds of respending continue until all of the original \$182 has been respent outside the county. The interdependency coefficient sums up all of the local respending plus the initial income received by the given sector, such as resorts. In the case of the resort sector, the total interdependency coefficient for Itasca County in 1966 was 2.81. Thus, the initial expenditure of \$182 resulted in an additional \$329.42 of sales by Itasca County firms and households ($\$182.00 \times 1.81 = \329.42).

Additional impacts on the Itasca County economy of the vacationing Chicago family could be determined in a similar manner by multiplying the expenditures made by the visitors in each of the other sectors, such as grocery, drug, and sundry, by the appropriate interdependency coefficients. The total impact in this case is shown in table 11.

Therefore, using the general coefficients for each of the relevant Itasca County sectors, an expenditure of \$352 by the vacationers would have yielded a total of \$822.18 of business activity or sales within Itasca County in 1966. An effective multiplier of about 2.34 resulted from the expenditure pattern of this hypothetical Chicago family. It must be kept in mind, of course, that the direct-plus-indirect coefficients used in this example are weighted averages for their respective sectors. The coefficient for each sector reflects a variety of establishments, varying in size, technology, and even kind, even though the units within a sector have been grouped together because of a presumed general similarity of role in the economy being studied.

The exact impact of any given expenditure will therefore depend upon the specific item-by-item chain of respending generated by the expenditure. However, even though the impact measures obtained by using these weighted average community multipliers are only approximations, they nevertheless provide a heretofore unavailable estimate of relative impact of alternative expenditure patterns.

Similar examples dealing with wood products could have been developed. A resort example was used because this is a type of forest-associated activity of considerable interest in the county. A specific wood products industry case is examined in a later section of this report.

As noted previously, the direct-plus-indirect coefficient or local multiplier effect generally varies inversely with the proportion of sales receipts respent outside the local economy by the receiving sector. That is, as the percentage of a sector's receipts that are immediately respent by that sector outside the local area increases, the local community multiplier effect of that sector decreases. This general relationship can be verified by observing in appendix table 3 the direct-plus-indirect coefficients for sector 1 (timber production), the highest at 3.45, and for sector 14 (grocery, drug, and sundry sales), the lowest at 1.33. Note also the technical coefficients in appendix

Table 11. Total impact of expenditures during hypothetical 2-week visit by out-of-state family to an Itasca County resort in 1966

Sectors in which expenditures are made	Amount of expenditure	Direct-plus-indirect coefficient	Itasca County impact*
Grocery, drug, and sundry	\$ 80.00	1.33	\$106.40
Dry goods, appliances, and furniture	30.00	1.62	48.60
Gasoline and service stations . .	24.00	2.44	58.56
State government	36.00	2.70	97.20
Resorts	182.00	2.81	511.42
Total	\$352.00	...	\$822.18

* Includes initial expenditure.

table 2 for these two sectors. Sector 1 data show that 90 percent of its sales receipts are respent in the local economy. This is the greatest proportion of sales receipts respent locally by any sector. At the same time, sector 14 respent only 13 percent of its receipts locally. This is the lowest local respending ratio of any sector.

Of course, using only local respending coefficients does not provide an infallible basis for ranking sectors according to their relative multiplier effect. Sector 8 (construction and contracting), for example, respent 88 percent of its sales receipts locally. It ranked third behind timber growing and professional services in this respect. However, its direct-plus-indirect coefficient of 3.15 ranked seventh, following several other sectors whose local respending ratios were a few points lower. Nevertheless, the general relationship between local respending ratios and community multipliers is a direct one. The implication for promotional activities in behalf of local economic development is that those industries with high local respending ratios; i.e., industries that respent a high proportion of total receipts locally, should be encouraged because their local community multiplier effect will tend to be relatively high. However, this guide must be employed carefully in specific instances and will be discussed in more detail below.

Employment Impacts

Input-output analysis can be used to estimate employment impacts and multipliers in the same way that the sales multipliers above were derived. However, complete employment data on a man-year basis for the sectors used in this study generally were not available. So employment multipliers are not developed in this report. Subsequent analyses will be directed at this area.

Some Forestry-Related Impacts

There are several kinds of changes and impacts that can be examined within the input-output framework developed for Itasca County. Three will be discussed to illustrate the use of these results:

1. A change (increase or decrease) in the sales level of a given sector.

2. A structural change; i.e., a change in the number of establishments by size, class, and/or kind, within a sector.
3. The addition of an entirely new kind of business to the economy.

The examples used to illustrate the kinds of changes and impacts that can be evaluated do not reflect the entire range of possibilities that can be considered for Itasca County, even though they do relate to current possibilities and changes in the county. More importantly, these cases provide a concrete setting useful for illustrating some important principles in applying the results of input-output analysis.

A major point in applying the kind of input-output framework developed for Itasca County is that any changes that are to be evaluated, including land ownership or investment changes, must be converted into their expected results in dollars of annual sales. Furthermore, realistic evaluations require that both resource and market constraints on changes throughout the interrelated economic chain of activities be kept in view. For example, even though timber production had the highest local community multiplier in this study, land for timber growing in Itasca County does have some limit and the markets for Itasca County timber are not infinitely large. Fortunately, the input-output framework itself provides a constant reminder of the necessary interrelationships.

Level of Sale Changes: Timber Stumpage Sales

In Itasca County, as in some other areas of north-eastern Minnesota, there is an apparent physical surplus of timber in certain species, especially aspen. As noted above, it has been estimated that in 1961 300,000 cord equivalents of wood could have been removed from Itasca County's forests in addition to the amount actually harvested. This volume, enough for over 400 tons per day of chemical pulping if it were economically worthwhile to use it, has been sizeable enough to stir speculation about new and expanded industry to convert this wasted resource into jobs and income and to provide incentive for more intensive management of the county's forests. In 1961, this surplus annual volume also included 47 million board feet of saw-timber-sized trees, mainly aspen; but it included some jack pine, balsam fir, and a mixture of hardwoods other than aspen.

At this point, however, the question is not the exact level of timber available for cutting annually, but rather the impact of changes in the level of timber sales.⁶ Changes in the level of sales, measured in dollar terms, can reflect three basic kinds of changes:

1. An increase or decrease in volume of timber sold, prices remaining unchanged.

2. An increase or decrease in timber prices, volume sold remaining unchanged.
3. A change in the mix of timber; i.e., the proportions of sawtimber and pulpwood in the total timber volume sold or the proportions of the total made up of each species, prices remaining unchanged.

All of these kinds of changes may, and very likely will, occur simultaneously and in response to several other changes that may be only partially reflected in the input-output framework, but that nevertheless will influence the values included in the analysis. For example, the price of pulpwood delivered to a mill may remain constant over a fairly large range of annual pulpwood purchases by the mill. However, pulpwood stumpage purchases and harvesting may increase within this fixed price range as a result of adoption of new and/or cost-reducing harvesting techniques, which would increase the annual dollar value of timber sales. New technology adoption in turn would mean a change in the expense pattern for timber harvesters, and this change would be reflected in subsequent changes throughout the input-output framework. Another example, and perhaps a more usual one, would be a change in the volume and price of timber purchased and sold in response to a change in the mill prices offered for logs and bolts. The impact of these kinds of changes, by sector and for the economy as a whole, can be approximated for Itasca County with the results of input-output analysis.⁷ An example is given below.

Assume that an additional 50,000 cords of pulpwood stumpage per year were to be sold from Itasca County's forests in response to expanded wood needs of the pulp-mill in Grand Rapids. This amount would be in addition to other wood requirements, which the mill presumably would obtain from other counties in its wood procurement zone. It might be assumed further that the average package of timber making up this increased cut is composed of the following volumes of different species at the indicated prices:

Aspen	30,000 cords @ \$1.00
Jack pine	5,000 cords @ \$2.00
White and red pine	5,000 cords @ \$1.60
Spruce	5,000 cords @ \$4.50
Mixed hardwoods	5,000 cords @ \$1.00

The total annual stumpage sales value of this package is \$75,500. Finally, assume that the stumpage sellers; i.e., the Chippewa National Forest, the George Washington State Forest, and other public and private owners, supply the stumpage in the same proportions as they did in 1966, the data base year for the Itasca County input-output analysis.⁸

⁶ In this paper, timber sales refer to sales of standing timber or stumpage only and not to cut log sales.

⁷ Emphasis must be given to the word approximated, inasmuch as the physical proportions; e.g., the number of people hired as offbearers in a sawmill, may change in response to market changes in lesser or greater degree than the change in sales value. However, unless the changes are of great magnitude and involve entirely new production methods, the input-output coefficients can be used to approximate the short-run impact of change.

⁸ This final assumption is made because the responding of receipts pattern of each of these classes of stumpage sellers is somewhat different. Consequently, their individual impact effect is different. The coefficients in the input-output tables are, accordingly, weighted averages for the combined ownership classes. Individual ownership class coefficients could be developed if there were need to do so in future evaluations.

The direct impacts of respending this \$75,500 increase in stumpage sales in Itasca County would be distributed approximately as follows:

Inside Itasca County	
Stone, clay, glass, and cement	\$ 111
Other industry n.e.c.*	111
Construction and contracting	555
Lumber, building materials, and hardware	333
Auto, truck, and machinery sales	444
Gasoline and service stations	222
Auto and machinery repair	444
Dry goods, appliances, furniture, etc. n.e.c.*	111
Other retail n.e.c.*	111
Professional services	111
Skilled trades and services	111
Hotel, motel, and commercial rental	333
Electric utilities	222
Communications	222
Wholesale and distributing	333
County government	16,210
Households	47,853
Total inside	\$67,837
Outside Itasca County	\$ 7,663
Total	\$75,500

* n.e.c. means not elsewhere classified.

It is clear that the principal direct beneficiaries of increased timber sales in Itasca County would be the county residents themselves. In this case, about 90 percent of the respending of income by timber growers and sellers goes directly to local people, businesses, and government. Households, in fact, receive 63 percent and are benefited additionally by county receipts that are redistributed largely inside the county, mainly to school districts and households.

In view of the high proportion of local respending of total receipts by timber growers and sellers, it is not surprising that the local community multiplier effect also should be high. Again, as shown in table 10 and appendix table 3, the direct-plus-indirect effect of \$1 worth of sales by the timber production sector is \$3.45. Thus, for every \$1 of stumpage sales made by local timber growers and sellers, an additional \$2.45 of sales activity occurs within Itasca County. This means that an increase of \$75,500 in Itasca County timber sales would yield approximately \$185,000 of additional sales by other Itasca County sectors, including households. The total impact compared with direct impact alone is shown in table 12.

Notice in table 12 that the sum of the indirect sales impact column is only \$116,916, rather than the \$185,000

figure obtained above using the multiplier of 2.45. This is because the remaining \$68,000 of additional sales impact is accounted for by the direct local respending of the timber production sector and is included in the direct sales impact column. Thus, it is clear that local impact effects have two major parts: the local respending of receipts by the sector of interest and the subsequent rounds of local respending of these receipts by the recipients.

Of course, this specific level-of-sale impact usually would not occur by itself. It most likely would be only one of several impacts that would occur as a result of some other change such as the assumed increase in wood needs by the pulpmill. Stumpage sales would be largely equivalent to purchases by the timber operator sector, which in turn are the result of pulpwood purchases by the pulpmill. So the impacts of timber operator sales increases also would need to be approximated in a manner similar to that used above for timber production. For example, if sales to the local pulpmill by the local timber operator sector increased by 50,000 cords a year at an average price of \$15 a cord, or a total value of \$750,000, the additional direct-plus-indirect impact upon the Itasca County economy associated with the increase in sales by the timber operator sector and associated input sector sales such as those for timber production would be almost 2¼ million dollars.⁹ Furthermore, all other local sectors that make sales to the pulpmill would have their own impact effects upon the local economy that could in turn be approximated with the input-output framework.

Finally, another aspect, production input or resource constraints, should be considered. The above impact evaluation, involving as it does only some 50,000 additional cords of wood annually, does not appear to require additional timber volumes in excess of those available each year from Itasca County's forests. However, employment and other input requirements; e.g., power and water, for all of the increased sales activity stimulated by this change would require careful scrutiny.¹⁰ Would there be, for example, enough workers available locally to cut the needed timber, or would a premium wage be necessary to attract them from other counties or other jobs? This question is especially relevant in Itasca County and other northeastern Minnesota areas because timber operators often are multiple job holders and mining especially competes with forestry for labor.¹¹

A related issue concerns the impacts of new investments in timber growing or stumpage production. These impacts, too, can be approximated with the Itasca County input-output coefficients. Two stages would be required. The first would deal with the initial investment pattern; i.e., the amount of money spent, presumably in a given year, in each internal sector to initiate timber growing.

⁹ Of course, such impacts would not be added totally to those already estimated for timber production, since presumably the timber operator sales impact also will reflect the increased sales of timber production and associated impacts.

¹⁰ Battison and Jansma (1) have developed factor-intensity coefficients to relate factor requirements to sales changes. These coefficients in turn provide a means for imposing a linear programming model upon a local economy for determining optimum economic development programs.

¹¹ A supplementary sample survey of timber operators in Itasca County in 1966 showed that 19 percent of the operators worked in the mines, 15 percent farmed, and 13 percent worked in other phases of the wood products industry. A variety of other occupations also was indicated. Thus, logging tends to be a part-time seasonal job for many operators, principally the small operator producing 500 cords of wood or less per year.

Table 12. Direct and indirect effects of a hypothetical increase of \$75,500 of timber sales in Itasca County

Local sector	Direct sales impact	Indirect sales impact	Direct-plus-indirect sales impact
		dollars	
Timber production	75,500	11	75,511
Timber operators	0	174	174
Sawmills	0	437	437
Agriculture	0	0	0
Food processing	0	909	909
Stone, clay, glass, and cement	111	503	614
Other industry n.e.c.*	111	1,973	2,084
Construction contracting	555	3,592	4,147
Transportation and warehousing	0	960	960
Lumber, building materials, and hardware	333	2,051	2,384
Auto, truck, and machinery sales and supplies	444	6,668	7,112
Gasoline and service stations	222	3,011	3,233
Auto and machinery repair	444	1,600	2,044
Grocery, drug and sundry sales	0	16,060	16,060
Dry goods, appliances, furniture, etc. n.e.c.*	111	5,151	5,262
Food and beverage sales	0	2,465	2,465
Other retail n.e.c.*	111	496	607
Professional services	111	2,605	2,716
Skilled and semi-skilled trades and services	111	938	1,049
Finance, real estate, and insurance	0	7,438	7,438
Hotel, motel, and commercial rental	333	31	364
Electric utilities	222	1,930	2,152
Communications	222	1,678	1,900
Wholesale and distributing	333	5,616	5,949
Resorts	0	202	202
Recreation and entertainment	0	1,043	1,043
Education	0	124	124
Nonprofit organizations	0	762	762
Public schools	0	9,348	9,348
Local government	0	3,616	3,616
County government	16,210	3,849	20,059
State government (local)	0	3	3
Federal government (local)	0	17	17
Households	47,853	28,107	75,960
Overflow	0	3,548	3,548
Total	143,337	116,916	260,253

* n.e.c. means not elsewhere classified.

These amounts multiplied by the local community multiplier for each sector receiving such expenditures would yield an estimate of the initial investment impact. The second stage would require estimating the present and future annual timber sales effects of the investment. Having estimated the sales attributable to the investment, the impact approximations, which would be subject to judgments about changes in the local economy and its coefficients over time, would proceed in the manner outlined above.

Structural Changes: Resorts

The high incidence of resorts in Itasca County is fostered by its outstanding forests and waters. Its many lakes and rivers vary in character and usually are surrounded by forests. Although the water itself may be the primary environmental attraction for resort guests, the surrounding forests are an important element in the setting. Moreover, the existence of resorts in particular locations often influences the kind of management given to

adjacent forests. For these reasons and because resorts represent an important element in the county's economic life, a separate resort sector was developed in this study.

Although the historical record of the resort industry of Itasca County is not well-documented, it seems clear that the county's industry structure is changing. Many of its resorts were established in the twenties and thirties, when transportation to the fishing lakes of the area from the Twin Cities and Chicago was more rigorous than today. Resort guests were more affluent and remained longer than today's typical visitor. Boom times for resorts in Itasca County apparently reached a peak immediately after World War II. Some resorters reported during interviews that more than 400 resorts were operating in the county during the late forties. Records of the Minnesota Department of Health show, however, that since 1959 the number of resorts in Itasca County has fluctuated from around 250 to a few over 300. Enumerations for this study revealed that 267 resorts were operating in the county in 1966. Since the peak periods, the major change in the resort industry apparently has been a de-

cline in the number of small resorts (half a dozen cabins or so), often by sale of individual cabins to private parties or to a larger neighboring resort. This change has concentrated the resort business in larger resorts, although the general trend does not appear to be associated with the establishment of large, entirely new ones.

Appendix table 3 shows that the resorts sector has a relatively high local community multiplier of 2.81, ranking 12th in this respect among the internal sectors of this study. Again, this position is associated with a relatively high local respending of receipts percentage. For every dollar of income received by the Itasca County resort sector, another \$1.81 of local sales occurs within the county. An example showing how the various impacts of resort visitors can be traced throughout the economy has been given in a preceding section.

As noted before, each sector of the basic input-output framework for this study is a collection of different businesses, each of which has its own respending of income pattern, its own sources of income, and, hence, its own impact or local community multiplier effect. The single multiplier for a sector is therefore a weighted average for the sector as a whole. The resort sector multiplier discussed above and included in the appendix tables also reflects this weighted average effect of combining or aggregating all resorts. In Itasca County in 1966, this meant averaging data for resorts ranging in size and character from a primitive two-cabin type to one of the largest resorts in Minnesota, which has a large lodge, dining facilities, out cabins, golf course, and ski facility.

To examine more closely the possible impacts of this apparently changing industry, the sector was disaggregated by splitting it into six parts based on gross income. These income classes, with their respective respending of receipts patterns and community impact multipliers, are shown in table 13.

The disaggregated results shown in table 13 provide only a rough indication of relationships, since the sample for the resort sector was not taken with regard for income classes as separate populations or strata. Nevertheless, the results are suggestive and confirm certain expectations. For one thing, as resort size increases, the proportion of expenditures made by the resort within the local area tends to decline. As a consequence, the local community multiplier also decreases as resort size increases. The large resorts have such facilities as dining rooms, skiing areas, gift shops, and elaborate marinas. Furthermore, some of them have made extensive modernization investments in recent years. These circumstances have resulted in the proportionally greater ties of the large resorts to businesses outside the county.

Generally speaking, the resort sector of Itasca County is not a high profit sector. In 1966 the sector as a whole lost money in the sense that it had a depletion (or external investment) of some \$92,000. That is, current account receipts in 1966 were less than current account expenditures for the year by this amount. Many resorts,

especially in the small gross income classes, are owned and operated by people who reside elsewhere and have other occupations in the off-season. Household savings and income from other employment often are plowed into the resort operation. Renovation and expansion financing by the larger resorts is often accomplished with capital from outside county sources. Since most resorts operate as unincorporated businesses, net income is reflected in the input-output framework largely as household income. Those gross income classes in table 13 that show no payment to households operated at a loss as a class in 1966.

The relative impact effects of a structural change in the county's resort industry are generally clear. If resort business were to increase, and if the increase were concentrated in the large resorts, the multiplier effect probably would be less than that assumed by use of the overall resort multiplier of 2.81. However, this does not necessarily mean that small resorts are to be preferred to large resorts as a means of enhancing the county's economic well-being. It simply means that for every dollar of income received by small resorts, more dollars of business are generated within the county than would be the case if that dollar went to a large resort. On the other hand, a large resort may attract many more dollars of initial income than a small resort and thereby result in a greater total income effect. Therefore, those responsible for encouraging the development of the resort industry in Itasca County should consider the total economic impact in addition to the marginal impact generated by a dollar of resort income. Other aspects of resort development also must be assessed to determine the relative desirability of large and small resorts. Some of these aspects are the amount and kinds of funding available, the relative supply of resort sites, and the nature of the desired resort amenity package; e.g., a few large multiple activity resorts concentrating guests in a few locations or many small rustic resorts dispersed throughout the county. The public service systems; i.e., roads and other transportation, water and sewage, medical facilities, fire control systems, etc. needed to service these alternative resort patterns also must be considered.

New Business Addition: Chip-and-Saw Mill

The above discussion has been mainly in terms of certain changes within the county economic structure that existed in 1966. However, local economic development groups often are concerned with other interesting and perhaps more dramatic questions. Such questions concern the possibilities associated with new, and usually larger, kinds of industry. The impacts of new industry also can be approximated using the input-output framework, with, of course, certain resource and market constraints on size and kind of new industry evaluated.

One new business evaluated here is a chip-and-saw mill constructed in Itasca County in 1969.¹² Although the

¹² Acknowledgement is gratefully given to Jack Rajala of the Rajala Mill Company at Bigfork, Minnesota for permission to use the data supplied by his company.

Table 13. Expenditure patterns and multipliers for disaggregated resort sector, Itasca County, 1966

Sector number	Sector name	Expenditure pattern (technical coefficients) by resort income class						Direct-plus-indirect effect (direct-plus-indirect coefficients) by resort income class							
		25 Single sector aggregate	26 \$0-\$2,000	27 \$2,000-\$6,000	28 \$6,000-\$10,000	29 \$10,000-\$20,000	30 \$20,000-\$30,000	30 \$30,000-\$500,000	25 Single sector aggregate	26 \$0-\$2,000	27 \$2,000-\$6,000	28 \$6,000-\$10,000	29 \$10,000-\$20,000		30 \$20,000-\$30,000
1	Timber production	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2	Timber operators	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.004	0.005	0.003	0.004	0.003	2
3	Sawmills	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.012	0.015	0.009	0.011	0.008	3
4	Agriculture	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
5	Food processing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.007	0.009	0.009	0.007	0.009	5
6	Stone, clay, glass, and cement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.008	0.013	0.007	0.009	0.006	6
7	Other industry n.e.c.*	0.017	0.028	0.016	0.009	0.020	0.018	0.012	0.032	0.048	0.037	0.027	0.037	0.030	7
8	Construction and contracting	0.059	0.051	0.131	0.042	0.073	0.048	0.025	0.094	0.100	0.176	0.081	0.115	0.073	8
9	Transportation and warehousing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.014	0.013	0.012	0.014	0.014	9
10	Lumber, building materials, and hardware	0.059	0.088	0.082	0.059	0.079	0.054	0.018	0.081	0.114	0.114	0.083	0.104	0.071	10
11	Automobile and truck sales, machinery, and equipment supplies	0.022	0.019	0.000	0.059	0.047	0.000	0.000	0.073	0.078	0.069	0.121	0.099	0.035	11
12	Gasoline and service stations	0.028	0.060	0.041	0.021	0.026	0.030	0.012	0.051	0.087	0.072	0.048	0.050	0.047	12
13	Automotive and machinery repair, supplies, and salvage	0.007	0.014	0.008	0.006	0.006	0.003	0.003	0.021	0.034	0.028	0.022	0.021	0.017	13
14	Grocery, drug, and sundry sales	0.060	0.019	0.045	0.071	0.052	0.188	0.033	0.158	0.128	0.180	0.197	0.147	0.250	14
15	Dry goods, appliances, furniture, and other household goods n.e.c.*	0.045	0.037	0.029	0.038	0.067	0.133	0.012	0.077	0.074	0.074	0.080	0.100	0.155	15
16	Food and beverage service	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.016	0.020	0.019	0.014	0.009	16
17	Other retail n.e.c.*	0.007	0.005	0.004	0.006	0.006	0.030	0.003	0.012	0.010	0.010	0.011	0.011	0.034	17
18	Professional services	0.006	0.009	0.000	0.003	0.012	0.006	0.005	0.023	0.030	0.024	0.029	0.018	0.022	18
19	Skilled and semi-skilled trades and services	0.019	0.009	0.033	0.015	0.029	0.012	0.007	0.028	0.034	0.044	0.025	0.039	0.018	19
20	Finance, real estate, and insurance	0.100	0.181	0.061	0.068	0.137	0.061	0.073	0.164	0.259	0.146	0.144	0.207	0.111	20
21	Hotel, motel, and commercial rental	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	21
22	Electric utilities	0.039	0.107	0.049	0.027	0.044	0.012	0.015	0.054	0.125	0.069	0.044	0.059	0.023	22
23	Communications	0.030	0.042	0.024	0.027	0.038	0.012	0.023	0.046	0.062	0.045	0.046	0.056	0.026	23
24	Wholesale and distributing	0.115	0.102	0.094	0.089	0.169	0.218	0.062	0.173	0.184	0.175	0.152	0.228	0.264	24
25	Resorts: \$0-\$2,000 gross income	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000	0.000	0.000	0.000	0.000	25
26	Resorts: \$2,000-\$6,000 gross income	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	1.000	0.000	0.000	0.000	26
27	Resorts: \$6,000-\$10,000 gross income	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	27
28	Resorts: \$10,000-\$20,000 gross income	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	28
29	Resorts: \$20,000-\$30,000 gross income	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	29
30	Resorts: \$30,000-\$500,000 gross income	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.001	0.001	0.001	0.001	0.000	30
31	Recreation and entertainment	0.018	0.019	0.008	0.038	0.020	0.030	0.003	0.025	0.026	0.017	0.047	0.026	0.034	31
32	Education	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.000	32
33	Nonprofit organizations	0.007	0.009	0.004	0.009	0.014	0.000	0.002	0.014	0.019	0.013	0.019	0.023	0.006	33
34	Public schools	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.083	0.060	0.052	0.042	0.020	34
35	Local government	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.025	0.043	0.034	0.031	0.025	0.013	35
36	County government	0.059	0.140	0.086	0.074	0.055	0.018	0.013	0.091	0.179	0.128	0.112	0.090	0.043	36
37	State government (local unit)	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	37
38	Federal government (local unit)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	38
39	Households	0.098	0.000	0.209	0.226	0.014	0.000	0.267	0.449	0.495	0.632	0.587	0.429	0.285	39
40	Overflow	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.027	0.030	0.027	0.020	0.013	40
	Total internal	0.795	0.953	0.924	0.893	0.908	0.876	0.588	2.807	3.302	3.253	3.042	3.018	2.635	
41	Households, external	0.023	0.005	0.000	0.000	0.000	0.000	0.067							41
42	State government, external	0.046	0.000	0.016	0.027	0.000	0.012	0.108							42
43	Federal government, external	0.041	0.023	0.029	0.044	0.058	0.012	0.040							43
44	All other external	0.092	0.019	0.029	0.036	0.023	0.097	0.197							44
	Total external	0.202	0.047	0.074	0.107	0.081	0.121	0.412							
	Total	0.997	1.000	0.998	1.000	0.989	0.997	1.000							

* n.e.c. means not elsewhere classified.

Table 14. Estimated coefficients and impacts for a chip-and-saw mill in Itasca County, construction and operation stages

Sector number	Sector name	Construction stage			Operation stage		
		Expenditure pattern	Direct-plus-indirect multiplier	Increase in money flow, thousand dollars	Expenditure pattern	Direct-plus-indirect multiplier	Increase in annual money flow, thousand dollars
1	Timber production	0.0000	0.0002	0	0.0743	0.0860	92
2	Timber operators	0.0000	0.0032	2	0.2597	0.2834	306
3	Sawmills	0.0000	0.0085	5	0.0000	0.0043	5
4	Agriculture	0.0000	0.0000	0	0.0000	0.0000	0
5	Food processing	0.0000	0.0034	2	0.0000	0.0071	8
6	Stone, clay, glass, and cement	0.0085	0.0202	12	0.0000	0.0036	4
7	Other industry n.e.c.*	0.0000	0.0350	21	0.0000	0.0439	47
8	Construction and contracting	0.1424	0.1546	91	0.0000	0.0286	31
9	Transportation and warehousing	0.0000	0.0040	2	0.2579	0.2861	308
10	Lumber, building materials, and hardware	0.0000	0.0178	10	0.0000	0.0176	19
11	Auto and truck sales and machinery and equipment supplies	0.0712	0.1031	61	0.0000	0.0828	89
12	Gas and service stations	0.0000	0.0142	8	0.0000	0.0389	42
13	Auto and machinery repair, supplies, and salvage	0.0000	0.0074	4	0.0250	0.0487	52
14	Grocery, drug, and sundry sales	0.0000	0.0728	43	0.0000	0.1383	149
15	Dry goods, appliances, furniture, etc. n.e.c.*	0.0000	0.0189	11	0.0000	0.0398	43
16	Food and beverage service	0.0000	0.0090	5	0.0000	0.0188	20
17	Other retail n.e.c.*	0.0000	0.0026	2	0.0019	0.0063	7
18	Professional services	0.0000	0.0089	5	0.0028	0.0224	24
19	Skilled and semi-skilled trades and services	0.0000	0.0056	3	0.0000	0.0098	11
20	Finance, real estate, and insurance	0.0000	0.0349	21	0.0223	0.0943	102
21	Hotel and motel commercial rental	0.0000	0.0091	0	0.0000	0.0011	1
22	Electric utilities	0.0000	0.0079	5	0.0325	0.0484	52
23	Communications	0.0000	0.0084	5	0.0019	-0.0181	19
24	Wholesale and distributing	0.0000	0.0295	17	0.0251	0.0871	94
25	Resorts	0.0000	0.0022	1	0.0000	0.0031	3
26	Recreation and entertainment	0.0000	0.0038	2	0.0000	0.0079	9
27	Education	0.0000	0.0004	0	0.0000	0.0009	1
28	Nonprofit organizations	0.0000	0.0031	2	0.0000	0.0065	7
29	Public schools	0.0000	0.0086	5	0.0000	0.0357	38
30	Local government	0.0000	0.0080	5	0.0000	0.0244	36
31	County government	0.0000	0.0177	10	0.0213	0.0756	82
32	State government (local unit)	0.0000	0.0000	0	0.0000	0.0000	0
33	Federal government (local unit)	0.0000	0.0000	0	0.0000	0.0001	0
34	Households	0.0932	0.2762	163	0.1150	0.5798	625
35	Chip-and-saw mill	0.0000	1.0000	0	0.0000	1.0000	0
36	Overflow column, depletion row	0.0627	0.0734	43	0.0650	0.0910	98
	Total internal	0.3780	1.9633	566	0.9044	3.2404	2,414
37	Households, external	0.0000	.....	.....	0.0000	.....	.....
38	State government, external	0.0000	.....	.....	0.0186	.....	.....
39	Federal government, external	0.0000	.....	.....	0.0612	.....	.....
40	All other external	0.6220	.....	.....	0.0158	.....	.....
	Total external	0.6220	.....	.....	0.0956	.....	.....
	Total	1.0000	.....	.....	1.0000	.....	.....

* n.e.c. means not elsewhere classified.

mill is basically a sawmill for producing boards and thus is closely allied to the already existing sawmill sector, it uses a different technology than used in the typical sawmill. Briefly, the mill chips those portions of the log that otherwise would be considered waste during lumber processing. Most of the waste is converted into chips for pulp and paper manufacture and for other products utilizing chipped wood particles.

The basic procedure for approximating the impact of a new business that would both buy from and sell to other sectors of the local economy consists of creating a new sector in the old input-output framework. In this case, estimated annual expenditures by the new mill to each of the existing sectors, both within and outside the

county, were obtained from the mill owners. These figures provided the basis for constructing a new transaction matrix; i.e., showing the annual dollar value of intersectoral purchases and sales. In addition, estimates were obtained for expected annual sales by the mill and the shares of sales made within and outside the county. All coefficients were then recalculated, since the addition of a new internal sector changes both the direct and indirect relationships among sectors to some degree.

The above process was carried out two times, once for the mill construction stage and again for expected operation conditions. Estimated construction costs for the mill were \$590,000. As shown in table 14, however, only 38 percent or approximately \$223,000 of this investment

would be spent in Itasca County. Local contract construction firm services and local labor were the principal items of local purchase during the construction stage. Most equipment and much of the material for the new mill was purchased outside the county. As a result, the local impact effect of the construction stage was relatively small compared to the operation stage.

The impact effects of the construction stage can be traced in some detail using the coefficients of table 14. Again, the initial spending of the \$590,000 investment within Itasca County amounted to only about \$223,000. However, the increase in local money flows associated with this \$223,000 was about \$566,000. The effective multiplier for this local spending was thus about 2.54 ($\$566,000 \div \$223,000$). Note that the total increase in local sales can be approximated by multiplying the initial \$590,000 investment by the local multiplier minus one ($1.9633 - 1$, or $.9633$).¹³

Evaluation of the operation stage was based upon the mill owner's estimates of "de-bugged" operation. Annual sales were projected to be over \$1 million. The coefficients in table 14 show that about 90 percent of the receipts are to be respent within Itasca County. As a consequence, a relatively high local community multiplier of 3.24 is obtained. Thus, for an average \$1 of sales (including chips and lumber) by the mill, an additional \$2.34 of business activity takes place within the county. If, therefore, the mill has annual sales of \$1 million, an additional \$2,340,000 worth of county business might be anticipated.¹⁴

Table 14 indicates that even though many sectors such as grocery, drug, and sundry sales do not receive any direct respending of receipts from the new mill, they do benefit indirectly. That sector, for example, would realize an indirect benefit of approximately \$149,000 of increased sales.

Related Activities

The three kinds of changes discussed above are the obvious kinds of changes that might be evaluated using an input-output framework. However, a variety of other activities less directly related to sales changes also can be evaluated and frequently are of interest to local planners.

As an example, suppose a new bridge across a river were required to accommodate the increased loads and frequency of traffic occasioned by log hauling to the new mill. A series of impact effects associated with the bridge could be approximated with the input-output framework. The bridge construction stage itself would offer an opportunity, just as the construction stage for the new mill did. However, instead of creating a new internal sector, the impact of bridge construction can be handled like the hypothetical example of spending by the vacationing family from Chicago. Assume that it would cost \$100,000

Table 15. Approximate direct-plus-indirect impact effects of internal expenditures for hypothetical bridge construction in Itasca County

Sector	Direct-plus-indirect multiplier*	Expenditure amount	Total effect
Sawmills	3.11	10,000	31,100
Stone, clay, glass, and cement ..	2.76	15,000	41,400
Lumber, building materials, and hardware	1.77	10,000	17,700
Automobile and truck supplies and repair	1.47	5,000	7,350
Wholesale and distributing	1.46	5,000	7,300
Transportation	1.79	5,000	8,950
Households	2.53	40,000	101,200
Total		90,000	215,000

* From appendix table 3.

to tear out the old bridge and build a new one. Assume further that the expenditure pattern for the job is:

Inside Itasca County	
Sawmills	\$ 10,000
Stone, clay, glass, and cement	15,000
Lumber, building materials, and hardware	10,000
Automotive and truck supplies	5,000
Wholesale and distributing	5,000
Transportation	5,000
Households (including wages, salaries, profit)	40,000
Total internal	\$ 90,000
Outside Itasca County	\$ 10,000
Total	\$100,000

To approximate the impact effect of these expenditures, each expenditure is multiplied by the local community multiplier (the direct-plus-indirect coefficient) for the sector within which it is spent. Thus, the total local effect of the \$10,000 expenditure in the sawmill sector would be $\$10,000 \times 3.11$, or \$31,100. Table 15 shows the approximate impact of the bridge construction program. The effective direct-plus-indirect multiplier is 2.15 ($\$215,000 \div \$100,000$). Even though only \$90,000 were spent locally during construction, an additional \$125,000 of local business activity could be anticipated.

Investments in timber growing also can be evaluated within the input-output framework. The basic expenditures for such activities as site preparation, planting, and thinning all have direct-plus-indirect effects that can be approximated using the multipliers associated with the sectors in which such expenditures are made.

Presumably, such activities eventually must pay their way within the context of other evaluation frameworks, such as equating present worth of future harvests with

¹³ The actual estimated amount is \$568,335, using the calculated inverse coefficient of 1.96328. However, rounding the increase in each sector to the nearest thousand dollars resulted in an underestimate of \$2,335.

¹⁴ As shown in table 14, the increase in annual money flows in the Itasca County economy during the mill operation stage is based on the owner's estimated annual sales of approximately \$1,077,000 rather than on \$1 million.

current management and production costs. However, the input-output framework provides for at least shortrun supplemental evaluations of the indirect effects of these activities and thereby provides a basis for drawing broader inferences about the economic benefits of timber-growing activities within local economies.

The issues of public vs. private and one kind of public vs. another kind of public ownership of forest land occasionally create complex problems for land use planners. An input-output framework such as that prepared for Itasca County can be used to shed additional light on some of the consequences of the alternatives. Suppose, for example, that a particular tract of forest land currently yields 10,000 cords of pulpwood stumpage a year in industrial ownership. Assume that the local economic impact of the sale of the 10,000 cords can be approximated using the timber production sector multiplier of 3.45 in appendix table 3, and that the annual sales value of the timber is \$20,000. Assume further that the tract is worth \$350,000 to the industrial owner as a timber-producing asset. Finally, assume that because of restricted economic supply of pulpwood, the 10,000 cord yield represents 5 percent of local pulp and paper production that would be foregone if it were unavailable to local industry, and that this would amount to \$1.5 million.

Suppose that the federal government proposed to purchase the land as part of a national park wherein no commercial logging would be permitted. Development plans and visitor projections for the proposed park show that one portal facility and a small visitor information center will be located in the county. Visitation estimates for the park over the first 10 years are:

Year	Park visitors
1	40,000
2	60,000
3	50,000
4	55,000
5	60,500
6	66,550
7	73,200
8	80,500
9	88,600
10	97,400

It is estimated that 50 percent of the projected visitation will occur within the county and that half of it would not have occurred without the park. In the first 3 years, the park is still in the construction and development stage. Average expenditures within the county per visitor per year are estimated at \$15. Thus, during the 5th year, estimated total visitor expenditures in the county would be $\$907,500 \times .50$, or \$453,750. However, only half, \$226,875, would be attributable to the park, since it has been assumed that normal increases in similar expenditures by tourists would have accounted for half as much without

Table 16. Some economic impacts of a hypothetical change from private to national park ownership of a hypothetical tract of timberland

Year	Annual effects foregone	Annual effects gained	Net change annually
thousand dollars			
1	2,700	469	-2,231
2	2,700	472	-2,228
3	2,700	394	-2,306
4	2,700	433	-2,267
5	2,700	476	-2,224
6	2,700	524	-2,176
7	2,700	576	-2,124
8	2,700	634	-2,066
9	2,700	698	-2,002
10	2,700	767	-1,933
Cumulative total	27,000	5,443	-21,557

the park. Park construction is planned for the 1st year and will cost an estimated \$70,000. Seventy percent will be expenditures in the county. Annual operation costs are estimated at \$20,000, 90 percent of which will be spent in the county.¹⁵

Table 16 contains a comparison of the two alternatives, based on the above assumptions and data for the first 10-year period. A local community multiplier of 1.80 has been assumed for pulp and paper manufacture. The construction and contracting local community multiplier of 3.15 has been applied to the construction expenditure for the park. Finally, a local community multiplier of 2.10 has been assumed for visitor expenditures.

The result of this illustrative case is a net loss to the county of some \$21,557,000 over the 10-year period. Note that the assumed pulp and paper multiplier accounts for all impacts associated with this activity, including taxes on the land, stumpage sales, and household income. Consequently, these items do not have to be considered separately, although they could be by using the individual sector multipliers applied to their appropriate portion of the pulp and paper sales decrease.

The purchase price of the industrial forest land also will have an impact somewhere. However, in order for it to have an impact on the local economy, it must be at least partially expended within the county. An input-output accounting of the sale of the land by the company would show an income or sales item of \$350,000 (if this were the price). The multiplier effect at this point would be 1. If this amount is subsequently respent by the company within the county, the multiplier effect would rise according to the amount and pattern of its disbursement.

The above case assumed a 5 percent reduction in production and sales of the local pulp and paper producer, a rather severe assumption in view of the general availability of wood elsewhere. If it is assumed that there would be no reduction in production and sales because the 10,000 cords could be obtained at comparable prices

¹⁵ A clear distinction must be maintained between those expenditures capturable by the area to which the input-output analysis applies and those that occur elsewhere. As a result, such analyses are necessarily more concerned with the distribution effects or impacts; i.e., the extent to which a specific area or group is affected by change, than with the growth or decline effects or impacts stemming from the change. Thus, while the evaluation in this case may show that the county benefits or loses by a given amount of business activity as a result of the new park, it does not show in similar detail what all of the impacts are elsewhere and the extent to which the project has had a plus or minus effect as a whole.

Table 17. Approximate direct-plus-indirect impact effects upon Itasca County economy of an additional \$500,000 investment in timber growing

Sector of investment	Investment amount	Sector multiplier	Direct-plus-indirect effect
..... thousand dollars.....			
Stone, clay, glass, and cement	3	2.76	8
Other industry n.e.c.*	3	1.71	5
Construction and contracting	15	3.15	47
Lumber, building materials, and hardware	9	1.77	16
Auto and truck sales and machinery and equipment supplies	12	1.47	18
Gas and service stations	6	2.44	15
Auto and machinery repair, supplies, and salvage	12	1.76	21
Dry goods, appliances, furniture, etc. n.e.c.*	3	1.62	5
Other retail n.e.c.*	3	1.93	6
Professional services	3	3.22	10
Skilled and semi-skilled trades and services	3	3.19	10
Hotel, motel, and commercial rental	9	3.18	29
Electric utilities	6	1.98	12
Communications	6	2.89	17
Wholesale and distributing	9	1.46	13
Households	314	2.53	794
County government, local	20	3.40	68
Federal government, external	64	...	...
Total	500	...	1,094

* n.e.c. means not elsewhere classified.

elsewhere, presumably outside the county, then the foregone timber stumpage sales alone would be the major item of concern. The sales would amount to approximately \$69,000 a year in direct-plus-indirect sales in the county, which is substantially less than the apparent gain from park visitor expenditures.

The arithmetic of impact estimation does not handle very satisfactorily the matter of resource constraints and employability. For example, it implies that the labor displaced from logging and work in the mill would be employable by those sectors of the economy servicing the enhanced tourist business. It implies further that disemployed resources would not create any additional cost burdens on the economy, and that other resources presently not used or available locally but needed to support increased activities in certain sectors are available. Furthermore, the conjectural nature of the basic projections; e.g., the costs and sales of the new chip-and-saw mill and the visitation and expenditure rates for park visitors, to which input-output coefficients are applied, must be fully understood and appreciated. Finally, the basic input-output coefficients themselves may be expected to change as new production methods and business practices are adapted. Such matters need to be examined carefully by local development groups to avoid misinterpretation of the signals given by input-output analysis.

Some Additional Guides for Assessing Itasca County Development Possibilities

The purpose of this discussion has not been to show how Itasca County should be developed, but to show how to assess some of the shortrun economic impacts of changes as the county is developed. Prescriptions for change and development are possible and might be based

upon some optimizing model such as linear programming, which Battison and Jansma (1) have proposed. However, necessary knowledge about resource constraints in Itasca County is not yet available for effective adaptation of such an approach. Instead, a brief discussion of some general guides for assessing development possibilities is presented.

Multiplier Effect: Not a Clear Signal

The timber production sector emits a strong signal for special emphasis because it has the highest community impact multiplier in Itasca County. However, the multiplier is a result of economic activity, not a cause. The multiplier effect really is a response of the local economy to activities elsewhere, and these other activities must be forecast in order to forecast local economic impact. Market sales forecasts are basic for applying the results of this input-output study. In other words, investments in the production of goods and services bear little fruit unless those goods and services can be sold.

Suppose, for example, that an additional \$500,000 were available for investment in timber growing in Itasca County and that the direct-plus-indirect coefficients of the input-output tables provide general guides for approximating the impacts of this investment. Table 17 shows a possible distribution of this investment and the resulting direct-plus-indirect effects upon the county economy. The effective multiplier of this investment pattern is approximately 2. A glance at appendix table 3 suggests that such a multiplier is at about the right magnitude when timber sales are not included as an impact effect.

Again, however, if the timber produced by these investments is not sold, the investment impact will not be sustained. Therefore, for the full direct-plus-indirect ef-

fect of the timber production sector to be realized and maintained, timber markets must be developed. The multipliers shown in appendix table 3 are to be applied to product sales for each sector in order to be consistent with the kind of input-output framework developed for Itasca County.

The key question thus becomes: What are the prospects for increased sales of timber from Itasca County forests? The mere existence of an apparently surplus timber resource does not shed much light on the prospects for increased timber sales. In fact, the existence of such a surplus may indicate a lack of solid prospects for increased sales. On the other hand, some opportunities may exist for additional investments in timber management to make the resource more marketable. These opportunities as well as market opportunities must be explored more fully before questions about increased timber sale prospects can be answered.

In any case, the existence of a high multiplier for a sector is not in itself a clear signal of significant opportunities for economic development. It does, nevertheless, provide a relative indicator of local impacts, given the sales potential and resource availability to make use of it. Furthermore, the large multiplier for the timber production sector points up the relative sensitivity of the county economy to changes in the level of timber sales from county forests. Consequently, it also suggests that county planners should encourage added opportunities for timber sales, with due regard for resource characteristics.

On the average, sawmilling in Itasca County has a community multiplier of 3.11. The new chip-and-saw mill apparently will have a somewhat higher multiplier. Pulp and paper manufacturing, although not shown separately in the appendix tables, has a comparatively low multiplier of approximately 1.80. This situation should not suggest, however, that sawmills be preferred to pulp and paper mills. Obviously, one new pulp and paper mill representing an investment of \$50 million or so, sales of several million dollars annually, and employment in the hundreds would have more total impact on the county economy than a million dollar sawmill. If the resources and markets for sustaining increased pulp and paper manufacturing are available, planners should encourage such developments, for the increments to such an industry tend to be large.

In any case, the principal consideration in evaluating new industry opportunities within this input-output framework is sales potential. Suppose there were an additional 250,000 cords of timber available annually, in economic amounts, from Itasca County forests. Suppose further that the wood can be made available as sawtimber for the sawmilling industry, as pulpwood for the pulp and paper industry, or as some combination. The question is: What form of wood products industry should be encouraged to generate the largest business impact upon the county?

Assume that any new pulp and paper venture in the county would require all of the 250,000 cords of timber annually. Assume further that this would represent ap-

proximately \$30 million of annual paper sales by a new mill, which would then mean \$54 million of local direct-plus-indirect effect upon the county economy, given a multiplier of 1.80.

Suppose the additional timber supply were channeled completely into new sawmilling capacity and that markets would absorb production with no effect upon price. The sales result of this increased production would be approximately \$8 million annually. Assuming a multiplier of 3.20 for this industry, a total direct-plus-indirect effect of only \$25,600,000 is obtained. In this case, county planners obviously would hope for new pulp and paper production in the county.

Suppose, however, that timber markets outside the county were to expand and that county planners could influence the distribution of timber to alternative markets. Directing all additional timber to the pulp and paper industry outside the county would yield additional annual timber sales of approximately \$600,000. Using the timber production multiplier of 3.45, this would yield a total direct-plus-indirect effect of \$2,070,000. On the other hand, because of the higher unit values for sawtimber, new timber sales valued at perhaps \$1,250,000 annually would be generated if the additional wood were sold as sawtimber. This possibility would result in a total direct-plus-indirect effect of approximately \$4,312,500. In short, a new industry with a high multiplier but low sales potential may not represent as good a choice for local economic development as one with a low multiplier but high sales potential.

Land Use Changes

A perennial question facing most county planners is the impact upon the local economy if land uses change. New zoning regulations may encourage one form of land use and discourage others, and each use may have its own unique multiplier or direct-plus-indirect effect. Application of alternative tax rates may influence land use. Technological changes and the relative profitabilities of alternative enterprises also affect land use patterns.

Assume that an out-of-state cattleman is impressed with the high grass production capabilities of Minnesota pastureland. He wants to develop a 20,000 acre tract of summer rangeland for a beef cattle operation. At present, the tract is county owned, about half covered with productive forests, and yields an annual county timber sale income of \$22,000. The county appraises the land at \$22 an acre, making the prospective price for the tract \$440,000. The question facing the county commissioners is: Would the county be worse or better off, in terms of business activity, if it sells the land to the cattleman and gives up the \$22,000 per year of timber sale income with its attendant multiplier effects?

Assuming that the county government multiplier of 3.40 is appropriate in this case, the land purchase would result in an immediate direct-plus-indirect effect of \$1,496,000. Clearing and seeding 10,000 acres of forest land is estimated to cost \$450,000 and to have its own

Table 18. Annual respending of receipts pattern and direct-plus-indirect effects of hypothetical beef cattle operation

Sector of expenditure	Expenditure pattern	Amount of respending	Direct-plus-indirect coefficient	Direct-plus-indirect effect
Timber production	.01	\$ 2,500	3.45	\$ 8,625
Timber operators	.01	2,500	3.00	7,500
Sawmills	.01	2,500	3.11	7,775
Agriculture	.01	2,500	2.77	6,925
Stone, clay, glass, and cement	.01	2,500	2.76	6,900
Transportation and warehousing	.02	5,000	1.79	8,950
Lumber, building materials, and hardware	.01	2,500	1.77	4,425
Gas and service stations	.01	2,500	2.44	6,100
Grocery, drug, and sundry sales	.01	2,500	1.33	3,325
Electric utilities	.01	2,500	1.98	4,950
Communications	.01	2,500	2.89	7,225
Wholesale and distributing	.03	7,500	1.46	10,950
County government	.01	2,500	3.40	8,500
Households	.01	2,500	2.53	6,325
Total internal	.17	\$ 42,500	...	\$98,475
Households, external	.10	25,000		
State government, external	.06	15,000		
Federal government, external	.12	30,000		
All other external	.55	137,500		
Total external	.83	\$207,500		
Total	1.00	\$250,000		

impact multiplier of 2.80 (based upon projected expenditure patterns), for a total direct-plus-indirect effect of \$1,260,000. Other initial range improvements including fencing, roads, shelter and stock pen construction, seeding, and initial fertilization cost an added \$100,000 and have a multiplier of 2, yielding direct-plus-indirect effects of \$200,000.

Assume that these lands can carry 1,000 head of beef cattle for 3 months each year. Annual sales are expected to average \$250 per animal for a total of \$250,000. The assumed respending of receipts pattern and local direct-plus-indirect effects are shown in table 18. In this case, steers are shipped from various purchase points for one season's grazing and then reshipped to feedlots for finishing. All sales are made outside the county. As noted in table 18, only 17 percent of total sales receipts are respent in the county. A direct-plus-indirect multiplier applicable to total sales would be approximately .394 ($\$250,000 \times .394 = \$98,500$). This includes the direct respending of the sales income in the county as well as the indirect effects associated with each sector within which the respending occurs.

On the basis of these data, an annual direct-plus-indirect effect upon the county economy of \$98,500 would be expected as a result of the beef cattle operation. This figure compares with \$75,900 of annual direct-plus-indirect effects from timber sales from the county-owned land. The apparent net benefit associated with the beef cattle operation on this basis alone is \$22,600 per year.

Additional benefits also would accrue to the county as a result of initial purchase costs and range improvements.

Although this illustration clearly points to the beef cattle operation rather than to county ownership for timber production, two points must be emphasized. First is the degree of certainty that the new enterprise will be viable and as likely to maintain sales levels and benefits as the existing enterprise. In this case, initial development benefits alone are equivalent to approximately 39 years of county timber sales benefits. But, once the forests are destroyed to develop grasslands, 50-60 years might be required to restore them to a continuous harvest basis. Furthermore, additional investments in forest re-establishment would be required, with returns delayed until the re-established forest matures. A costly and lengthy hiatus in economic activity could occur if the beef cattle operation were not successful.

A second consideration is income redistribution. As an example, households in the county would receive approximately \$22,134 directly and indirectly as a result of \$22,000 in timber sales. As a result of the hypothetical beef cattle operation, they would receive directly and indirectly only \$6,325 annually.¹⁶ However, other sectors such as transportation and warehousing would benefit a great deal more than they would under the county land use alternative. Thus, not only can the absolute level of business activity be changed as a result of land use changes, but the relative amounts of economic benefit for various economic sectors also can be changed.

¹⁶ Of course, households also would receive some income from the initial development and purchase expenditures. However, such one time effects most likely would not offset the loss of over \$15,000 annually.

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Appendix A—Itasca County Input-Output Study, 1966 Sectoral Delineation, 39 x 39 Sector Model

Sector number	Sector name	Sector number	Sector name
1	Timber production: county, state, and federal agencies and industrial forests.	18	Professional services: 4 chiropractors, 3 hospitals, 10 attorneys, 6 funeral homes and ambulance services, 13 doctors and clinics, 17 dentists, 3 optometrists, 2 rest homes, 4 accountants, 1 chemical laboratory, and 1 dental laboratory.
2	Timber operators: 657 loggers.	19	Skilled and semi-skilled trades and services: 14 barber shops, 15 beauty shops, 17 cleaners and laundromats, 10 TV repair shops, 6 shoe repair shops, 3 photo studios, 4 carpenter shops, 1 well driller, 2 radiator repair shops, 1 gunsmith, 1 car wash, 2 steam baths, 1 child care service, 1 tree service, 1 jukebox sales and service, and 1 upholstery shop.
3	Sawmills: 29 sawmills.	20	Finance, real estate, and insurance: 11 real estate establishments, 4 loan companies, 12 insurance companies, 10 banks, 1 credit rating bureau, and 1 collection agency.
4	Agriculture: used secondary information, 1964 U.S. Census of Agriculture and 1966 Annual Report, farm management program of northeastern Minnesota (approximately 1,000 farms).	21	Hotel, motel, and commercial rental: 42 apartment buildings, 6 trailer courts, and 18 motels and hotels.
5	Food processing: 5 dairies, 2 bakeries, 1 wild rice processor, 1 soft drink bottler, 1 wholesale meat processor, and 1 miscellaneous foods processor.	22	Electric utilities: 7 power distributors.
6	Stone, clay, glass, and cement: 1 monument company, 2 sand and gravel processors, and 3 cement companies.	23	Communications: 4 radio and TV stations and 5 telephone companies.
7	Other industry n.e.c.*: 1 instrument (banjo) maker, 2 cabinet makers, 1 chair manufacturer, 1 water ski manufacturer, 3 agricultural supplies processors, 5 mines, 1 paper mill, 3 other manufacturers, and 5 printing and publishing establishments.	24	Wholesale and distributing: 26 bulk gas and oil distributors and jobbers, 5 wholesale beverage distributors, 2 wholesale lumber supply and building materials companies, 4 bottle gas sales, and 1 cold storage plant.
8	Construction and contracting: 8 road construction and related activities establishments, 7 plumbing and heating contractors, 3 home construction and related repairing establishments, 2 electric contractors, and 1 power line repair company.	25	Resorts: 267 resorts.
9	Transportation and warehousing: 3 warehouses, 8 trucking companies, 1 railroad, 1 airport, 1 cab company, 1 bus depot, and 1 parcel delivery service.	26	Recreation and entertainment: 6 sporting goods stores, 5 theatres, 7 bait stores, 4 bowling alleys, 6 amusement centers, and 4 retail sales of boats, motors, and bikes.
10	Lumber, building materials, and hardware: 14 hardware stores, 15 lumber yards, and 3 paint stores.	27	Education: Iowa State University forestry summer camp, Itasca Junior College, and the North Central School and Experiment Station.
11	Automobile and truck sales and machinery and equipment supplies: 1 farm machinery dealer, 10 new car sales establishments, 1 truck sales establishment, and 2 used car dealers.	28	Nonprofit organizations: 62 churches, 39 fraternal groups, and 4 summer camps.
12	Gasoline and service stations: 71 gasoline and service stations.	29	Public schools: 4 school districts.
13	Automotive and machinery repair, supplies, and salvage: 2 tire companies, 19 auto parts and repair shops, 4 body shops, 4 machining and welding establishments, and 5 junk yards.	30	Local governments: 17 villages and 41 townships.
14	Grocery, drug, and sundry sales: 47 grocery stores, 8 drug stores, and 1 sundry sales establishment.	31	County government
15	Dry goods, appliances, furniture, and other household goods n.e.c.*: 2 shoe stores, 8 furniture stores, 5 electrical appliance stores, 19 clothing stores, and 13 general stores.	32	State government
16	Food and beverage service: 39 taverns, 14 liquor stores, and 64 restaurants.	33	Federal government
17	Other retail n.e.c.*: 6 jewelry shops, 3 office supplies and equipment stores, 1 chain saw sales, 10 novelty stores, 3 florists, 1 musical instruments sales, 2 mobile home sales, and 2 commercial ice sales.	34	Households: A few more than 10,000 households in 1966.
		35	Overflow = row/depletion = column
		36	Households, external
		37	State government, external
		38	Federal government, external
		39	All other external

* n.e.c. means not elsewhere classified.

5. Approximate 1966 expenditures for new capital equipment, including company cars and trucks.

a) From within Itasca County?

<u>General classification or kind of equipment</u>	<u>Total expenditures</u>
_____	_____
_____	_____
_____	_____
_____	_____

b) From outside Itasca County?

<u>General kind of equipment</u>	<u>Total expenditure</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

6. What was your approximate 1966 depreciation in plant and equipment?

7. What was the approximate value of your 1966 change in inventory?

gain _____ loss _____

8. What are your primary sources of capital funds?

a) Internal funding (from within the company) _____

b) From banks within Itasca County _____

c) From public or private agencies within Itasca County other than
banks _____

d) From other sources within Itasca County _____

e) From sources outside of Itasca County _____

9. What was your total value added by manufacturing for 1966? _____
10. a) What were your approximate payments to the Federal Government in 1966 for both employer's and employee's share of social security?
_____.
- b) What were your approximate payments to the Federal Government in 1966 for employee's income taxes withheld? _____
- c) What were your approximate payments of all other kinds to the Federal Government in 1966 (exclusive of the payments in A and B above)? This would include corporate taxes, business taxes, excise taxes, etc. _____
- d) What were your approximate net payments of all kinds during 1966 to the State Government and its agencies? Include unemployment compensation, excise taxes, etc. _____
- e) What were your approximate total payments of all kinds during 1966 to the County and local Government including school districts?

11. What were your approximate outlays in 1966 for raw materials, contract work, and component parts?

a) From within Itasca County

General kind of input	volume or quantity	approximate total cost

b) From outside Itasca County

General kind of input	Volume or quantity	Approximate total cost

12. What were your approximate outlays in 1966 for the following?
(Please do not show any expenditure more than once)

	<u>local</u>	<u>outside</u>	<u>total</u>
a) Costs of general supplies not entering final product	_____	_____	_____
b) Costs of maintenance and repair of plant and equipment (except motor vehicles)	_____	_____	_____
c) Rental payments	_____	_____	_____
d) Electric power and light	_____	_____	_____
e) Heat & Fuel--coal, oil, gas (underline those used)	_____	_____	_____
f) Telephone and telegraph	_____	_____	_____
g) Water & sewage	_____	_____	_____
h) Insurance (premium payments only--including hospitalization for employees)	_____	_____	_____
i) Finance (interest payments only)	_____	_____	_____
j) Transportation			
1. rail	_____	_____	_____
2. truck (Common & contract carrier)	_____	_____	_____
3. Other	_____	_____	_____
k) Personal Services (accountants, auditing, legal, medical, etc.)	_____	_____	_____
l) Maintenance and operating costs of cars, trucks, and other vehicles (except labor) including allowances for business use of personal care	_____	_____	_____
m) General office expenses (except labor)	_____	_____	_____
n) Sales expenses including advertising (except labor)	_____	_____	_____
o) Contributions to nonprofit organizations	_____	_____	_____

local outside total

p) Retirement or pension fund payments (employer's share only) _____

q) Miscellaneous _____

13. What was your approximate total production from this plant during 1966 (in tons, M b.f., or other appropriate physical units)?

Description	Units

14. (Head Office only) What were your total dividend payments in 1966, if any? _____ About how much of this was paid: locally? _____ outside? _____

15. What was your approximate 1966 total gross income from your Itasca County operation only? _____

16. What proportion of the total gross income originating at your Itasca County operation would you estimate came from inside and outside the county and what principal kinds of economic activities would you say the purchasers were engaged in (if final consumer, please state "consumer"). For branch plants not making direct sales, please place in the column marked "approximate value" an estimate instead of the proportion of your total production from this plant going to the activities or business you list:

a) Itasca County
Activity or business _____ Approximate value _____

b) Outside Itasca County
Activity or Business _____ Approximate value _____

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

FOR AUTHORIZED PERSONNEL ONLY

University of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Construction
Contracting

General Business Class: _____

Location: _____

Interviewer: _____

1. What proportion of this business is locally owned (owners residing in Itasca County)? _____

2. What was your average employment during 1966?

<u>Number of Employees</u>		<u>Total</u>
<u>part-time</u>	<u>full-time</u>	<u>Payroll</u>

Itasca County residents _____

Non-Itasca County residents _____

3. Major type of contract or construction work performed? _____

4. What were your approximate capital expenditures for new buildings, including land, and additions or remodeling of existing buildings used in connection with your business during 1966 _____

_____ About how much of this was purchased outside of Itasca County? _____

5. What were your approximate 1966 expenditures for new capital equipment, including cars, trucks, and other automotive or power equipment?

	<u>Kind of Equipment</u>	<u>Total Cost</u>
(a) From within Itasca County	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____

(b) From outside Itasca County _____

6. What was your approximate depreciation in plant and equipment during 1966?

7. What was the approximate value of your change in inventory during 1966?

Gain _____ Loss _____

8. What are your primary sources of capital funds?

(a) Internal funding (from within the company) _____

(b) From banks within Itasca County _____

(c) From public or private agencies with Itasca County other than banks _____

(d) From other sources within Itasca County _____

(e) From sources outside of Itasca County _____

9. (a) What were your approximate payments to the Federal Government in 1966 for both employer's and employee's share of social security?

9. (continued)

(b) What were your approximate payments to the Federal Government in 1966 for employee's income taxes withheld?

(c) What were your approximate payments of all other kinds to the Federal Government in 1966 (exclusive of the payments in (a) and (b) above? This would include corporate taxes, business taxes, excise taxes, etc.

(d) What were your approximate net payments of all kinds during 1966 to the State Government and its agencies? Include unemployment compensation, sales taxes, excise taxes, etc.

(e) What were your approximate total payments of all kinds during 1966 to the County and local Government including school districts?

10. What were your approximate outlays in 1966 for the following items? (Please do not show any expenditures more than once)

	<u>Local</u>	<u>Outside</u>	<u>Total</u>
(a) Cost of materials used by your firm in all of its construction and contracting jobs, including cost of materials purchased for retailing	_____	_____	_____
(b) Costs of materials and general supplies used in the operation of the business but not for resale	_____	_____	_____
(c) Costs of maintenance and repair of plant and equipment (except motor vehicles)	_____	_____	_____
(d) Rental costs	_____	_____	_____
(e) Electricity	_____	_____	_____
(f) Heat & Fuel -- coal, fuel oil, gas (underline)	_____	_____	_____
(g) Telephone and Telegraph	_____	_____	_____
(h) Water and Sewage	_____	_____	_____
(i) Insurance (premium payments only)-- including employer's share of hospitalization for employees	_____	_____	_____

14. (continued)

(c) Construction of hunting cabins, summer vacation homes or remodeling of existing ones for non-Itasca County residents

(d) Construction of new manufacturing or industrial buildings

(e) Remodeling or renovation of manufacturing or industrial buildings

(f) Construction of new stores or store buildings _____

(g) Remodeling or renovation of existing stores or store buildings _____

(h) Construction or remodeling for non-profit organizations _____

(i) Governmental accounts (including school) _____

(j) Farmers _____

(k) Utilities _____

(l) Others (specify) _____

5. What were your primary sources of capital funds in 1966?
- a. Internal funding (from within your company)? _____
 - b. From (other) banks within Itasca County? _____
 - c. From public or private agencies within Itasca County other than banks? _____
 - d. From other sources within Itasca County? _____
 - e. From sources outside of Itasca County? _____
6. What were your 1966 payments to government for the following:
- a. Federal government--employer and employee shares of social security? _____
 - b. Federal government--employee's income taxes withheld? _____
 - c. Federal government--all other excluding (a) and (b) above, including corporate taxes, business taxes, etc. _____
 - d. State government--net payments of all kinds including unemployment compensation, taxes, etc. _____
 - e. County government--total payments of all kinds? _____
 - f. Local government--total payments of all kinds? _____
7. What were your 1966 expenditures for the following:

Item	Location of Expenditure		Total
	Inside Itasca County	Outside Itasca County	
	-----Dollars-----		
a. Costs of materials and general supplies			
b. Maintenance and repair of plant and equipment			
c. Rental or lease			
d. Electricity			
e. Heat/fuel: coal, oil, gas (underline)			
f. Telephone/telegraph			
g. Other utilities			

Item	Location of Expenditure		Total
	Inside Itasca County	Outside Itasca County	
	- - - - - Dollars - - - - -		
h. Insurance (premium payments only, including hospitalization for employees)			
i. Finance (interest only)			
j. Professional services (accountants, lawyers, etc.)			
k. Skilled trade and repair service			
l. Other office expense (excluding labor)			
m. Maintenance and operation of vehicles (excluding labor)			
n. Advertising: Local newspaper Local radio and T.V. Other			
o. Contributions to non-profit organizations			
p. Retirement or pension fund payments (employer's share only)			
q. Miscellaneous			

8. (Banks only) How much did you earn in 1966 in "service charges" on demand deposits? _____
9. How much interest on government bonds of all types did you earn in 1966? _____
10. Approximately how much interest on mortgages held for your own account and on mortgages which you service for other lenders did you earn in 1966? _____
 What proportion of this would you estimate came from residents of Itasca County? _____
 What proportion of this latter amount would you estimate came from: a) industrial and manufacturing establishments _____;
 b) business and commercial establishments _____;
 c) Governmental bodies _____;
 d) private individuals _____.

11. During 1966 approximately how much interest did you receive on all other kinds of loans held for your account and on loans which you service for other lenders? _____ What proportion of this would you estimate came from residents of Itasca County? _____ Of this latter amount what proportion would you estimate came from:
- a) Industrial and manufacturing establishments _____
 - b) Business and commercial establishments _____
 - c) Governmental bodies _____
 - d) Private individuals _____
12. Approximately what were your total interest payments during 1966 to holders of time deposits? _____ About what proportion of this would you estimate was paid to residents of Itasca County? _____ Of this amount, about what proportion would you estimate was paid to the following:
- a) Industrial and manufacturing establishments _____
 - b) Business and commercial establishments _____
 - c) Governmental bodies _____
 - d) Non-profit organizations _____
 - e) Private individuals _____
 - f) Others (specify) _____
13. Do you manage any trusts for beneficiaries living in Itasca County? _____ If so, about how much was earned by all of them during 1966? _____
14. What were the approximate total premium payments on all kinds of insurance paid by your clients to you or your firm during 1966? _____ Of this amount, about what proportion came from clients outside of Itasca County? _____
15. Approximately how much did you receive in 1966 in commissions, rentals, and other fees (exclusive of insurance) from clients residing outside of Itasca County? _____

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

For Authorized Personnel Only

University of Minnesota
 School of Forestry
 St. Paul, Minnesota 55101

Households
 1. Town & Village _____
 2. Non-farm Rural
 Permanent _____

Location: _____

Interviewer: _____

1. About how much does your household spend per week for food and groceries?
 _____ Total for year _____ About what
 proportion of this is spent outside Itasca County _____.

2. Could you give an approximation of your 1966 household expenditures for
 the following:

Item	In Itasca County Local	Outside Itasca County Outside	Total
(a) Clothing and apparel _____			
(b) Medical care and drugs _____			
(c) Laundry, repair services, etc. _____			
(d) Education _____			
(e) Premiums for all forms of insurance _____			
(f) Entertainment and recreation (including bar and restaurant) _____			
(g) Electricity _____			
(h) Telephone and telegraph _____			

Item	In Itasca County Local	Outside Itasca County Outside	Total
(i) Heating costs (coal, fuel oil, gas--underline _____			
(j) Water and sewage _____			
(k) Contributions to nonprofit organizations _____			
(l) County and Local taxes _____			
(m) State and Federal taxes _____			
(n) Hired domestic help _____			
(o) Total automobile expenses (if not known go to 3) _____			
3. About how many miles per year do you drive your car? _____ What proportion of your gas, oil and car repairs do you purchase outside of Itasca County? _____			
4. Did you contribute in 1966 to anyone else's support who lives outside of Itasca County? _____ About how much did this amount to? _____.			
5. Did you or anyone else in your household purchase an automobile in 1966? _____ About how much was paid for it, in- cluding the trade-in allowance if any? _____ Was this purchased outside of Itasca County? _____.			
6. Did you buy any furniture or household appliances in 1966? _____ About how much did these cost? _____ What proportion was purchased outside the county? _____.			
7. Do you own or rent your home? _____ (For those renting-- How much rent do you pay? _____, per month. Does the owner live in Itasca County? _____.			
8. (For home owners)--Do you have a mortgage on this home? _____ About how much did your payments amount to in 1966 excluding taxes and insurance premiums? _____ (or, per month). Did you pay this mortgage here in Itasca County? _____.			

2. If farming is your main occupation:

a. How much of your 1966 farming income did you receive from the sale of:

Product Class	Amount Received		
	Total	Inside County	Outside County
1. Dairy products			
2. Livestock			
3. Vegetables			
4. Hay and grain feeds			
5. Wool, furs and hides			
6. Forest products			
7. Other (specify)			

b. If not included in (a) above, how much did you earn in 1966 from farming for others?

In Itasca County _____

Outside Itasca County _____

c. Did you lease or rent land from others for farming or grazing in 1966? Yes _____ No _____

Inside Itasca County _____

Outside Itasca County _____

- d. Did you lease or rent land to others for farming or grazing in 1966?
 Yes _____ No _____. If you did, how much did
 you receive in payment? \$ _____.
- e. Did you lease or rent land and/or cabins to others in 1966 for hunting,
 fishing or other recreation activities? Yes _____ No _____.
 If you did, how much did you receive in payment? \$ _____.
- f. In addition to (e) above, did you charge for fishing or hunting on
 your land in 1966? Yes _____ No _____. How
 much did you receive in payment? \$ _____.
- g. Did you hire labor or help in 1966? Yes _____ No _____.

Labor Residence	Number	Wages Paid
--------------------	--------	---------------

In Itasca County

Outside of
Itasca County

- h. What were your 1966 expenses associated with your farming?

Item	Expenses		Total
	In Itasca County	Outside Itasca County	
	- - - - - Dollars - - - - -		
1. Feed, seed, fertilizer, lime, plants.	_____	_____	_____
2. Hand tools	_____	_____	_____
3. Machinery repair and parts	_____	_____	_____
4. Handling costs	_____	_____	_____
5. Gas and oil	_____	_____	_____
6. Electricity (farm only)	_____	_____	_____
7. Custom work	_____	_____	_____
8. Veterinarian, breeding	_____	_____	_____
9. Others	_____	_____	_____

Obtain at least an estimate of the total of the above expenses and its
distribution between Itasca County and Outside-Itasca-County places.

- i. Did you buy land in 1966? Yes _____ No _____. If so, how much did you actually pay out in 1966 for the land? \$ _____. Did you purchase from or pay to a resident of Itasca County? Yes _____ No _____.
- j. Did you buy any farm equipment (including tractors, dairy and barn equipment) in 1966? Yes _____ No _____. If so, how much did you actually pay out for this equipment in 1966? \$ _____. How much was purchased within Itasca County? (\$ or %) _____.
- k. Did you buy livestock in 1966 for feeding or finishing out and resale during 1966? Yes _____ No _____. How much did you pay out for this livestock in 1966? \$ _____. How much has purchased within Itasca County? (\$ or %) _____.
- l. Did you buy any livestock in 1966 that you intend to keep for more than a year (including wool and fur beavers)? Yes _____ No _____. How much did you pay out in 1966? \$ _____. How much was purchased in 1966? (\$ or %) _____.
- m. Did you sell any land, livestock held for more than 6 months, equipment, or buildings in 1966? Yes _____ No _____. What was your gain \$ _____ or loss \$ _____ from such sales as reported on your income tax return?
- n. What was your 1966 depreciation in buildings, equipment and livestock as reported on your income tax return? \$ _____.
- o. Did you build any new buildings or repair or remodel any farm buildings (excluding your house) in 1966? Yes _____ No _____. How much did you spend on this in 1966? \$ _____. How much was purchased outside Itasca County? (\$ or %) _____.

p. What other items of farming expenditure and income for 1966 did you have that are not accounted for above? Please specify below:

Item	Inside Itasca County	Outside Itasca County	Total
------	-------------------------	--------------------------	-------

- - - - - Dollars - - - - -

Income:

Expenditure

3. About how much does your household spend per week for food and groceries?
_____ Total for year _____ About what
proportion of this is spent outside Itasca County _____.

4. Could you give an approximation of your 1966 household expenditures for
the following:

Item	In Itasca County Local	Outside Itasca County Outside	Total
(a) Clothing and apparel _____			
(b) Medical care and drugs _____			
(c) Laundry, repair services, etc. _____			
(d) Education _____			
(e) Premiums for all forms of insurance _____			
(f) Entertainment and recreation (including bar, restaurant, and vacations) _____			
(g) Electricity _____			
(h) Telephone and telegraph _____			
(i) Heating costs (coal, fuel oil, gas -- underline) _____			
(j) Water and sewage _____			
(k) Contributions to nonprofit organizations _____			
(l) County and Local taxes _____			
(m) Federal and State taxes _____			
(n) Hired domestic help _____			
(o) Total automobile expenses (if not known go to 5) _____			

5. About how many miles per year do you drive your car? _____
What proportion of your gas, oil and car repairs do you purchase outside
of Itasca County? _____

7. Did you contribute in 1966 to anyone else's support who lives outside of Itasca County? _____ About how much did this amount to? _____.
8. Did you or anyone else in your household purchase an automobile in 1966? _____. About how much was paid for it, including the trade-in allowance if any? _____. Was this purchased outside of Itasca County? _____.
9. Did you buy any furniture or household appliances in 1966? _____ About how much did these cost? _____ What proportion was purchased outside the county? _____.
10. Do you own or rent your home? _____ (For those renting) -- How much rent do you pay? _____ per month. Does the owner live in Itasca County? _____.
11. (For home owners) -- Do you have a mortgage on this home? _____ About how much did your payments amount to in 1966 excluding taxes and insurance premiums? _____ (or, per month). Did you pay this mortgage here in Itasca County? _____.
12. Do you own any other real estate? _____ Kind of property _____ Location: Inside County _____ Outside County _____. About how much, if any, rent or other income did you receive in 1966 from this property _____ About how much of this went to pay for the expenses of maintaining the property? _____.
13. Do you have a mortgage on this other property? _____ About how much did your payments amount to in 1966? _____ Did you pay this here in Itasca County? _____.
14. Did any of you make any payments on loans (besides mortgages) during 1966? _____ Approximately how much was paid? _____ Was this paid outside the county? _____.
15. Approximately what was the cost, if any, of any major improvements, renovations, or additions to your home during 1966? _____ About how much of this was purchased outside of the county? _____.
16. Did any of you receive any gifts, awards, or win any prizes last year? _____ About how much did you receive? _____ How much of this came from outside the county? _____.
17. Did any of you receive any money last year from sources such as: trust funds; interest from savings accounts; dividends and/or interest from stocks, bonds, and mutual funds? _____. How much did this amount to in 1966? _____. What part of this came from inside Itasca County? _____.
18. To make sure we haven't missed anything, do you have any business interests outside of Itasca County that we haven't discussed? Yes _____ No _____ About how much was earned from this last year? _____.

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

For Authorized Personnel Only

University of Minnesota
 School of Forestry
 St. Paul, Minnesota 55101

Mining

Company: _____

Location: _____

The following questions pertain only to your company's Itasca County operations in 1966.

1. What was the 1966 average employment at your Itasca County operations?

	number of employees		total
	part-time	full-time	\$ payroll
Itasca County residents			
Non-Itasca County residents			

2. What were your approximate 1966 expenditures for new buildings or additions, including land and remodeling of existing buildings? _____
 Approximately how much of this was purchased outside Itasca County? _____

3. Approximate 1966 expenditures for new capital equipment, including company cars and trucks.

a) Purchased within Itasca County?

General classification or kind of equipment	Total expenditures

b) Purchased outside Itasca County but for use by the Itasca County operations?

General kind of equipment	Total expenditure

4. What was the approximate 1966 depreciation in plant and equipment for your Itasca County operations? _____

5. What was the approximate value of your 1966 change in inventory (ore and/or ore concentrate stock-piled for shipment) for your Itasca County operations?

gain _____ loss _____

6. a) What were your approximate payments to the Federal Government in 1966 for both employer's and employee's share of social security? _____

b) What were your approximate payments to the Federal Government in 1966 for employee's income taxes withheld? _____

c) What were your approximate payments of all other kinds to the Federal Government in 1966 (exclusive of the payments in A and B above)? This would include corporate taxes, business taxes, excise taxes, etc. _____

d) What were your approximate net payments of all kinds during 1966 to the State Government and its agencies? Include unemployment compensation, excise taxes, etc. _____

e) What were your approximate total payments of all kinds during 1966 to the County and local Government including school districts? _____

7. What were your approximate outlays in 1966 for raw materials, mineral leases, contract work, and component parts?

a) From within Itasca County

General kind of input	volume or quantity	approximate total cost

b) From outside Itasca County

General kind of input	Volume or quantity	Approximate total cost

8. What were your approximate outlays in 1966 for the following?
(Please do not show any expenditure more than once)

	local	outside	total
a) Costs of general supplies not entering final product _____			
b) Costs of maintenance and repair of plant and equipment (except motor vehicles) _____			
c) Rental payments _____			
d) Electric power and light _____			
e) Heat & Fuel--coal, oil, gas (Underline those used) _____			
f) Telephone and telegraph _____			
g) Water & sewage _____			

8. (Continued)

	local	outside	total
h) Insurance (premium payments only- including hospitalization for employees) _____			
i) Finance(interest payments only) _____			
j) Transportation: 1. rail _____			
2. truck (Common & contract carrier) _____			
3. Other _____			
k) Professional Services (accountants, auditing, legal, medical, etc.) _____			
l) Maintenance and operating costs of cars, trucks, and other vehicles (except labor) including allowances for business use of personal car _____			
m) General office expenses (except labor) _____			
n) Sales expenses including advertising (except labor) _____			
o) Contributions to nonprofit organizations _____			
p) Retirement or pension fund payments (employer's share only) _____			
q) Miscellaneous _____			

9. What was your approximate total production from Itasca County operations during 1966 (in tons, M b.f., or other appropriate physical units)?

Description	Units

10. What was your approximate 1966 total gross income (or value of total production f.o.b. the mines) from your Itasca County operations only? _____.

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

FOR AUTHORIZED PERSONNEL ONLY

University of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Non-Profit
Organization

General Business Class: _____

Location: _____

Interviewer: _____

1. Kind of organization (church, service club, fraternal order, etc.)

2. About how many persons did your organization employ during 1966?

	Number of Employees		Total Payroll
	part-time	full-time	

Itasca County residents _____

Non-Itasca County residents _____

3. What were your approximate 1966 expenditures for new buildings, including land, and additions or remodeling of existing buildings?

_____ About how much of this was purchased outside of

Itasca County? _____

4. What were your approximate 1966 expenditures for new capital equipment, including cars used in connection with the business of the organization?

5. What were your approximate outlays in 1966 for the following items? Please do not show any expenditure more than once.

	Local	Outside	Total
--	-------	---------	-------

(a) Cost of goods purchased for resale _____

(b) Costs of materials and general supplies used in the operation of the business but not for resale _____

5. (continued)

	<u>Local</u>	<u>Outside</u>	<u>Total</u>
(c) Costs of maintenance and repair of plant and equipment except motor vehicles	_____	_____	_____
(d) Rental costs	_____	_____	_____
(e) Electricity	_____	_____	_____
(f) Heat & Fuel --coal, fuel oil, gas (underline)	_____	_____	_____
(g) Telephone and telegraph	_____	_____	_____
(h) Water and sewage	_____	_____	_____
(i) Insurance (premium payments only) including employer's share of hospitalization for employees	_____	_____	_____
(j) Finance(interest payments only)	_____	_____	_____
(k) Professional services (accountants, lawyers, doctors, etc.)	_____	_____	_____
(l) Skilled trade and repair services	_____	_____	_____
(m) Maintenance and operating costs of cars, trucks and other vehicles (except labor)(including allowances for business use of personal cars)	_____	_____	_____
(n) Office expenses (except labor)	_____	_____	_____
(o) Advertising	_____	_____	_____
(p) Retirement or pension fund payments (employer's share only)	_____	_____	_____
(q) Contributions, payments, etc. to parent organization or other activities supported wholly or in part by your organization	_____	_____	_____
(r) Miscellaneous	_____	_____	_____

6. What were your approximate total payments to the Federal Government in 1966 for social security payments, including both employer's and employee's shares?

7. What were your approximate total payments to the Federal Government in 1966 for income taxes withheld?

8. What were your approximate total payments of all kinds during 1966 to the State Government, including unemployment compensation, sales and use taxes, etc.
- _____
9. What were your approximate total payments of all kinds to the local and county government, including school districts, during 1966? _____
- _____
10. What were your approximate total gross receipts during 1966? _____
- _____ (Please include financial support, if any, from parent organization.)
11. About what proportion of your total receipts would you estimate came from sources outside of Itasca County? _____
12. Of the proportion that came from sources within Itasca County, about how much came from:
- (a) Gifts, donations, or dues _____
- (b) Sale of goods or services _____
- (c) Other (specify) _____
13. Of the proportion of your total gross receipts that came from sources within Itasca County about what proportion would you estimate came from the following?
- (a) Private individuals or households _____
- (b) Industrial or manufacturing firms _____
- (c) Retail stores or other small businesses _____
- (d) Governmental offices or agencies, including schools _____
- _____
- (e) Other (specify) _____

ITASCA COUNTY ECONOMIC STUDY

University of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Nonresident
Household Survey

1. General location within the county: C.U. _____ M.S.U. _____ Fire # _____
2. Number of persons presently occupying this dwelling? Adults _____
Children under 18 _____
3. About how long do you spend here each year and what months? _____
_____. How long have you been coming to Itasca
County? _____.
4. Do you rent or own this home? _____. If owned, do you rent to
any other families? _____ How many? _____ For how long? _____
5. Where is your permanent home? _____.
6. Principle occupation of the head of the household? _____
7. If you rent this home, is the owner a resident of Itasca County? _____.
If he is, about how much rent do you pay each year? _____.
8. (if owners) Approximately how much did you spend in 1966 for capital
expenditures for additions, renovations, remodeling? _____.
What proportion of this was purchased outside the county? _____.
9. Did you purchase any household equipment or furniture or appliances for
this house in 1966? _____. How much of this was purchased
outside of Itasca County? _____.
10. How much acreage do you have with this property? _____.
11. Do you rent any or all of this to a county resident? _____ About how
much rental payments do you receive each year? _____ Is the lessee
a farmer? _____ Hunting club? _____ Other? _____.
12. Do you receive any other payments for this property, such as
(a) land retirement payments, or conservation reserve payments _____
(b) sale of timber _____ Who was the purchaser _____
(c) other _____
13. Could you give us an approximation of your weekly expenditures within
Itasca County for each of the following items:
(a) food and general merchandise _____
(b) gas, oil, and other auto expenses _____
(c) restaurant and bar _____
(d) other entertainment and recreation _____

14. Could you give us an approximation of your yearly expenses within Itasca County for each of the following items:

- a) Professional services _____
- b) utilities - electric _____
 - heat _____
 - phone _____
 - water _____
- c) insurance _____
- d) finance _____
- e) caretaker or other local hired labor _____
- f) other _____

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

For Authorized Personnel Only

University of Minnesota
 School of Forestry
 St. Paul, Minnesota 55101

Professional Services

1. What proportion of this business is locally owned? _____
2. Average number of employees (including self) in 1966:

Number of Employees		Total
part-time	full-time	Payroll

Itasca County residents _____
 Non-Itasca County residents _____

3. What were your approximate 1966 expenditures for new buildings, renovations, or additions, including land, in connection with your business only? _____
 About how much of this was purchased outside of Itasca County? _____
4. Approximate 1966 expenditures for new capital equipment, including cars and other vehicles, used in connection with your business (specify kind of equipment)?

Kind of Equipment	Inside Itasca County	Outside Itasca County	Total

5. What were approximate outlays in 1966 for the following items?
 Please do not show any expenditure more than once.

	Inside Itasca County	Outside Itasca County	Total
a. Costs of materials, drugs, supplies, etc., used in connection with your business _____			

	Inside Itasca County	Outside Itasca County	Total
--	-------------------------	--------------------------	-------

- b. Costs of maintenance and repair of plant and equipment (except motor vehicles) _____
- c. Rental costs _____
- d. Electric _____
- e. Heat and fuel--coal, fuel oil, gas (underline) _____
- f. Telephone and telegraph _____
- g. Water and sewage _____
- h. Insurance (premium payments only on insurance directly connected with the business or its employees) _____
- i. Finance (interest payments only) _____
- j. Other professional services (accountants, lawyers, doctors, etc.) _____
- k. Trades and other services (repairmen, etc.) _____
- l. Maintenance and operating costs of cars and other vehicles used only in connection with the business including allowances for business use of personal auto _____
- m. Office expenses (excluding labor) _____
- n. Contributions to non-profit organizations _____
- o. Miscellaneous _____

6. What were your approximate outlays in 1966 for the following governmental payments (in connection with the business only)?

- a. Social Security payments to the Federal Government on employees only (both employer's and employee's shares) _____
- b. Employee's income taxes withheld _____
- c. Federal business taxes, if any, and all other Federal payments _____
- d. Total payments to the County Government including school districts _____
- e. Total payments to Local Government _____

7. What were your approximate gross receipts in 1966? _____
8. About what proportion of your gross receipts would you estimate came from customers residing outside of Itasca County? _____
9. About what proportion of your gross receipts would you estimate came from tourists hunters, or other non-Itasca County residents here on vacation? _____
10. About what proportion of your gross receipts originating within the county (county residents) were from the following?
 - a. Manufacturing and industrial firms _____
 - b. Retail, wholesale, and other business establishments _____
 - c. Local governmental bodies or agencies including schools _____
 - d. Private individuals or households _____
 - e. Non-profit organizations _____
 - f. Other (specify) _____
11. About what proportion of your total gross receipts are paid direct by insurance companies? _____
12. (Attorney's only) Do you manage any estates or trust funds for beneficiaries residing in Itasca County? _____ If so, about how much did all of them combined earn during 1966? _____

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

For Authorized Personnel Only

University of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Restaurants, Beverage Sales,
Motel and Hotel Resorts,
Recreation and Entertainment,
Trade and Services n.e.c.

1. How many months of the year are you open? _____
2. What proportion of this business is locally owned? _____
3. Average number of employees in 1966:

	Number of Employees		Total
	Part-time	Full-time	Payroll
Itasca County residents _____			
Non-Itasca County residents _____			

4. What were your approximate 1966 expenditures for new buildings or additions including land and remodeling of existing structures? _____
Approximately how much of this was purchased inside Itasca County? _____
5. Approximate 1966 expenditures for new capital equipment, including company cars and trucks:

	Kind of Equipment	Total Cost
a. From within Itasca County _____		

b. From outside Itasca County _____		

6. What are your primary sources of capital funds?
- a. Internal funding (from within the company) _____
 - b. From banks within Itasca County _____
 - c. From public or private agencies within Itasca County other than banks _____
 - d. From other sources within Itasca County _____
 - e. From sources outside of Itasca County _____
7. a. What were your payments to the Federal Government in 1966 for both employer's and employee's share of social security? _____
- b. What were your payments to the Federal Government in 1966 for employee's income taxes withheld? _____
- c. What were your payments of all other kinds to the Federal Government in 1966 (exclusive of the payments in (a) and (b) above? This would include corporate taxes, business taxes, excise taxes, etc.) _____
- d. What were your approximate net payments of all kinds during 1966 to the State Government and its agencies? Include unemployment compensation, excise taxes, etc. _____
- e. What were your approximate total payments of all kinds during 1966 to the County Government including school districts? _____
- f. Total payments of all kinds in 1966 to Local Government? _____
8. What were your approximate outlays in 1966 for the following items? (Please do not show any expenditure more than once).

	Inside Itasca County	Outside Itasca County	Total
a. Costs of merchandise purchased for resale (list by broad categories, such as food, gasoline, parts, etc.) _____			
<hr/>			
b. Costs of materials and general supplies used in the operation of the business, but not for resale _____			
<hr/>			
c. Costs of maintenance and repair of plant and equipment (except motor vehicles) _____			

	Inside Itasca County	Outside Itasca County	Total
d. Rental costs			
e. Electric			
f. Heat and Fuel			
g. Telephone and telegraph			
h. Water and sewage			
i. Insurance (premium payments only-- including hospitalization for employees)			
j. Finance (interest payments only)			
k. Transportation (specify by what kinds)			
l. Personal services: accountants, repair men, lawyers, doctors, etc.			
m. Maintenance and operating costs of cars, trucks and other vehicles (except labor) including allowances for business and use of personal cars			
n. General office expenses (except labor)			
o. Advertising			
p. Contributions to nonprofit organizations			
q. Retirement or pension fund payments (employer's share only)			
r. Miscellaneous			
9. Approximately what were your total gross receipts (sales) in 1966?			
10. About what proportion of these would you estimate came from customers outside of Itasca County?			
11. About what proportion of your total sales would you estimate were to tourists, hunters, or other non-Itasca County residents here on vacation?			

12. About what proportion of your total sales to Itasca County customers were in the following:

- a. Industrial and manufacturing plants _____
Mainly, what kind of plants were these? _____
- b. Other retail establishments _____
Mainly, what kind of stores were these? _____
- c. Governmental accounts (including schools) _____
- d. Households (final consumers) _____
- e. Others (specify) _____

13. Approximately what proportion of your total gross receipts are from sales of the following products or services:

- a. Restaurant and dining _____
- b. Bar _____
- c. Lodging _____
- d. Repair services and parts _____
- e. Cleaning and laundry _____
- f. Personal grooming services (barbers, beauty shop operators) _____
- g. Retail sales _____
- h. Recreation and entertainment services _____
- i. Other (specify) _____

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

FOR AUTHORIZED PERSONNEL ONLY

University of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Retail
Trade

General Business Class: _____

Location: _____

Interviewer: _____

1. Is this: a. Head Office _____

Location of branch stores (in Itasca County) _____

b. Branch Office _____

Location of head office _____

2. (For Head Office only) What proportion of this business is locally owned (i.e., owners residing in Itasca County)? _____

3. What was your average employment in 1966? _____

Employee Residence	Number of Employees		Total Payroll
	Part-time	Full-time	
Itasca County			
Outside Itasca County			

4. What were your expenditures in 1966 for new buildings or additions, including land, and remodeling of existing buildings? _____

Approximately how much of this was expended inside Itasca County? _____.

5. What were your 1966 expenditures for new capital equipment, including company cars and trucks?

Kind of Equipment	Expenditures		Total
	Inside Itasca County	Outside Itasca County	

6. What was your approximate 1966 depreciation in plant and equipment _____

7. What was the approximate value of your 1966 change in inventory?
Gain _____ Loss _____

8. What are your primary sources of capital funds?
- a. Internal funding (from within the company) _____
 - b. From banks with Itasca County _____
 - c. From public or private agencies within Itasca County other than banks _____
 - d. From other sources within Itasca County _____
 - e. From sources outside Itasca County _____

9. a. What were your approximate payments to the Federal Government in 1966 for both employer's and employee's share of social security? _____
- b. What were your approximate payments to the Federal Government in 1966 for employee's income taxes withheld? _____
- c. What were your approximate payments of all other kinds to the Federal Government in 1966 (exclusive of the payments in (a) and (b) above)? This would include corporate taxes, business taxes, excise taxes, etc. _____
- d. What were your approximate net payments of all kinds during 1966 to the State Government and its agencies? Include unemployment compensation, excise taxes, etc.? _____
- e. What were your approximate total payments of all kinds during 1966 to the County Government including school districts? _____
- f. Local Government payments in 1966 for all purposes? _____

10. What were your approximate outlays in 1966 for the following items?
Please do not show any expenditure more than once).

	<u>Inside Itasca</u>	<u>Outside Itasca</u>	<u>Total</u>
	<u>County</u>	<u>County</u>	
a. Costs of merchandise purchased for resale (list by broad categories such as food, clothing, etc.)			
b. Costs of materials and general supplies used in the operation of the business but not for resale			
c. Costs of maintenance and repair of plant and equipment (except motor vehicles)			
d. Rental costs			
e. Electricity			
f. Heat and fuel - coal, fuel oil, gas (circle)			
g. Telephone and telegraph			
h. Water and sewage			
i. Insurance (premium payments only-- including employer's share of hospitalization for employees)			
j. Finance costs (interest payments only)			
k. Transportation: rail			
	truck		
	Other		
l. Professional services (accountants, lawyers, etc.)			
m. Other services (e.g., repairmen laundry, etc.)			

	<u>Inside Itasca County</u>	<u>Outside Itasca County</u>	<u>Total</u>
n. Maintenance and operating costs of cars and trucks (except labor) including allowances for business use of personal cars _____			
o. General office expenses (except labor) _____			
p. Advertising _____			
q. Contributions to non-profit organizations _____			
r. Retirement or pension fund payments (employer's share only) _____			
s. Miscellaneous _____			
11. What, approximately, were your total gross sales at this store in 1966? _____			
12. About what proportion of these total sales would you estimate were to customers residing outside of Itasca County? _____			
13. About what proportion of your total sales are to tourists, hunters, or other non-Itasca residents here on vacation? _____			
14. Approximately what proportion of your total sales <u>within</u> Itasca County were to the following?			
a. Industrial or manufacturing plants _____ Mainly what kinds of plants were these _____			
b. Other retail and service establishments _____ Mainly what kinds of stores were these _____			
c. Farmers _____			
d. Builders and contractors _____			
e. Government accounts, including schools _____			
f. Non-profit organizations _____			
g. Households or private individuals (final consumers) _____			
h. Others (specify) _____			

15. Approximately what proportion of your total gross receipts are from sales of the following products?
- a. Food and groceries _____
 - b. Gasoline and automobile servicing and repairs _____
 - c. New and used car sales _____
 - d. Clothing and wearing apparel _____
 - e. Household furnishings and furniture, including appliances _____
 - f. Lumber, building materials, hardware _____
 - g. Drugs and cosmetics _____
 - h. Jewelry _____
 - i. Repair services _____
 - j. Other (specify) _____

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

For Authorized Personnel Only

Sawmills

University of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Number _____
Location _____

1. Did your mill operate in 1966? Yes _____ No _____

If "Yes", continue on to question 2.

If "No", please answer "a" and "b" below and stop.

a. Did mill operate in other years?

1. Before 1966? Yes _____ Years _____

No _____

2. 1967 or 1968? Yes _____ Years _____

No _____

b. Reasons for not operating in 1966:

2. What period during 1966 did your mill operate?

From _____ To _____

3. Is this mill your only business? Yes _____ No _____

4. Is mill operated in conjunction with or as part of another business? If "Yes" please specify:

Lumber and building materials _____
Farm _____
Wood products manufacturing _____
Other _____

5. Do you keep a separate set of accounts for expenses and receipts for the sawmill if operated as part of another business?

Yes _____ No _____

(If answer is "No", please estimate anyway to the best of your knowledge the answers to the remaining questions.)

6. What was your volume of sawmill production in 1966? _____
_____ board feet.

7. How much could you have produced at full capacity? _____
_____ board feet per year.

8. What kind(s) of head saw(s) (Main saw for initial breakdown of log) do you use? (Enter number of saws where appropriate)

Circular _____ Band _____ Gang _____

9. What lumber products did you produce and what proportion of total production was accounted for by each?

Boards _____

Dimension _____

Specialty (Specify) _____

10. Species of timber sawn and proportion of each:

Aspen _____

Pine _____

Spruce _____

Fir _____

Other _____

11. What were your sawmill employment and payroll in 1966?

	Itasca County residents	Non-Itasca County	Payroll in Dollars
Full-time			
Part-time			
Total			

12. Please estimate the following expenses for your sawmill in 1966, distinguishing as best you can between "Inside" and "outside" Itasca County expenditures:

Item	Where Spent		Total
	Inside County	Outside County	
1) Contract construction (incl. land, new buildings, remodeling)			
2) New capital equipment:			
a. Cars and trucks			
b. Sawmill machinery			
c. Furniture and other office equipment			
d. Other			
3) Maintenance and operating costs of business vehicles and equipment			
4) Rental payments (incl. real estate, equipment, etc.)			
5) Utilities:			
a. Electric			
b. Telephone and telegraph			
c. Water and sewage			
d. Heat (circle type: Gas, fuel oil, purchased wood, other)			
6) Finance costs:			
a. Interest payments			
b. Payments on principal			
7) Insurance (premium payments only)			
8) Professional services (Lawyers, doctors, accountants, consultants, etc.)			
9) Advertising costs			

12. (continued)

Item	Where Spent		Total
	Inside County	Outside County	
10) General Supplies			
11) Office expenses (exclude labor)			
12) Skilled trades (incl. repair men, but not own employees)			
13) Transportation			
14) Contributions to non-profit organizations			
15) Retirement or pension fund payments (employer's share only)			
16) Miscellaneous			

13. For sawmill only:

- a) What were your approximate payments to the Federal Government in 1966 for both employer's and employee's share of social security?
_____.
- b) What were your approximate payments to the Federal Government in 1966 for employee's income taxes withheld? _____.
- c) What were your approximate payments of all other kinds to the Federal Government in 1966 (exclusive of the payments in A and B above)? This would include corporate taxes, business taxes, excise taxes, etc. _____.
- d) What were your approximate net payments of all kinds during 1966 to the State Government and its agencies? Include unemployment compensation, excise taxes, etc. _____.
- e) What were your approximate total payments of all kinds during 1966 to the County and local Government including school districts?
_____.

14. What were your approximate outlays in 1966 for raw materials, contract work, and component parts for your sawmill only?

a) From within Itasca County

General kind of input	volume or quantity	approximate total cost

b) From outside Itasca County

General kind of input	volume or quantity	approximate total cost

15. What was your approximate 1966 total gross income from your Itasca County sawmill operation only? _____

16. What proportion of the total gross income originating at your Itasca County sawmill operation would you estimate came from inside and outside the county and what principal kinds of economic activities would you say the purchasers were engaged in (if final consumer, please state "consumer").

a) Itasca County

Activity or business	Approximate value

b) Outside Itasca County

Activity or Business	Approximate value

ITASCA COUNTY ECONOMIC STUDY

CONFIDENTIAL

University of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Timber Operator

Location: _____

1. The ownership and management of your timber cutting businesses:

Personal (or family): _____

Partners: _____

Corporation: _____

2. Number of men working full time: _____

Number of men working part time: _____

3. Average daily (or weekly) production: _____

and the maximum production: _____

4. Number of months worked in 1966: _____

What months: _____

5. 1966 production:

a. Product	<u>Aspen-Birch</u>	<u>Pine</u>	<u>Other</u>
------------	--------------------	-------------	--------------

Cords of Pulp

Bd. ft. of saw logs

Other _____

b. Percent of production from out of county: _____

Source of stumpage and distance from home.

	In county	Out of county	
Private land	_____	_____	miles _____.
County land	_____	_____	miles _____.
State land	_____	_____	miles _____.
Federal land	_____	_____	miles _____.

6. What is the maximum one-way distance you will go for stumpage: _____ miles.

How far will you go to sell your pulpwood: _____ miles.

7. Equipment used:

Description No., age, owned or rented, present value.

Chain saws:

Tractors (wheel or track):

Trucks:

Loaders:

8. What are your major limiting factors to increasing production.

(a) Weather _____

(b) Markets _____

(c) Stumpage _____

(d) Labor _____

(e) Equipment costs _____

(f) Prices received _____

(g) Financing for new equipment _____

(h) _____, _____

9. What are your future plans: expand, remain constant, quit, etc., and what will be the determining factors? _____

10. Description of operator.

(a) age _____

(b) years at this work _____

	Inside Itasca Co.	Outside Itasca Co.
(c) Total income all sources 1966	_____	_____
Amount of timber cutting	_____	_____
Major other source	_____	_____

11. General expenses for timber cutting 1966.

	In county	Out of county
(a) Gas and oil	_____	_____
(b) Equipment repair	_____	_____
(c) Stumpage	_____	_____
(d) Truckers	_____	_____
(e) Insurance	_____	_____
(f) Finance (interest only)	_____	_____
(g) Rental costs	_____	_____
(h) Wages	_____	_____
(i) Other _____	_____	_____

12. Expenditures for new equipment in 1966.

A. Within Itasca county _____

B. Out of Itasca county _____

13. If this is a corporation, what ~~were~~ the payments to both the Federal and State Governments in 1966?

Federal tax _____

State tax _____

Employee's tax withheld _____

Total social security _____

14. What are the markets for your production and the percent going to each?

	In county	Out of county
(a) Pulpmills	_____	_____
(b) Sawmills	_____	_____
(c) Pulpwood buyers	_____	_____
(d) Other _____	_____	_____

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

For Authorized Personnel Only

University of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Transportation

Kind of Firm: _____

Location: _____

Interviewer: _____

1. Major form of transportation _____

2. Location of main or head office _____

3. What proportion of this business is locally owned? _____

4. What was your average employment during 1966?

<u>Number of Employees</u>		<u>Total</u>
<u>part-time</u>	<u>full-time</u>	<u>Payroll</u>

Itasca County Residents _____

Non-Itasca County Residents _____

5. What were your approximate 1966 expenditures for new buildings or additions, including land, and remodeling of existing structures?

_____ About how much of this was purchased
outside of Itasca County? _____

6. What were your approximate 1966 expenditures for new capital equipment, including company cars, trucks, etc.?

<u>Kind of Equipment</u>	<u>Total cost</u>
--------------------------	-------------------

(a) From within Itasca County _____

6. (continued)

(b) From outside Itasca County _____

7. What was your approximate depreciation in plant and equipment during 1966? _____

8. What are your primary sources of capital funds?

(a) Internal funding (from within the company) _____

(b) From banks within Itasca County _____

(c) From public or private agencies within Itasca County other than banks _____

(d) From other sources within Itasca County _____

(e) From sources outside of Itasca County _____

9. (a) What were your approximate payments to the Federal Government in 1966 for both employer's and employee's share of social security? _____

(b) What were your approximate payments to the Federal Government in 1966 for employee's income taxes withheld? _____

(c) What were your approximate payments of all kinds to the Federal Government in 1966 (exclusive of the payments in (a) and (b) above)? This would include corporate taxes, business taxes, excise taxes, etc.

(d) What were your approximate net payments of all kinds during 1966 to the State Government and its agencies? Include unemployment compensation, excise taxes, etc.

(e) What were your approximate total payments of all kinds during 1966 to the County and local Government including school districts?

10. What were your approximate outlays in 1966 from this office for the following items? (Please do not show any expenditures more than once.)

	<u>Local</u>	<u>Outside</u>	<u>Total</u>
(a) Costs of goods and materials purchased for resale (if any)	_____	_____	_____
(b) Costs of materials and general supplies used in the operation of the business but not for sale	_____	_____	_____
(c) Costs of maintenance and repair of plant and equipment (except motor vehicles)	_____	_____	_____
(d) Payments to subcontractors or haulers	_____	_____	_____
(e) Rental costs	_____	_____	_____
(f) Electricity	_____	_____	_____
(g) Heat & Fuel--coal, fuel oil, gas (underline)	_____	_____	_____
(h) Telephone and telegraph	_____	_____	_____
(i) Water and Sewage	_____	_____	_____
(j) Insurance (premium payments only--including employer's share of hospitalization for employees)	_____	_____	_____
(k) Finance (interest payments only)	_____	_____	_____
(l) Professional services (accountants, lawyers, etc.)	_____	_____	_____
(m) Skilled trade and repair services	_____	_____	_____
(n) Maintenance and operating costs of cars, trucks and other vehicles (incl. aircraft and locomotives) (except labor) including allowances for business use of personal cars	_____	_____	_____
(o) Office expenses	_____	_____	_____
(p) Advertising	_____	_____	_____

14. What proportion of this would you estimate was paid by customers residing outside Itasca County or whose business was located outside the county?

15. Of your total receipts from Itasca County Customers only, what proportion would you estimate came from the following:

(a) Industrial or manufacturing concerns _____

(b) Retail or other small businesses _____

(c) Governmental operations, including schools _____

(d) Utilities _____

(e) Builders and contractors _____

(f) Households _____

(g) Other (specify) _____

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

For Authorized Personnel Only

Universtiy of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Utilities

Kind of Firm: _____

Location: _____

Interviewer: _____

1. Type of Utility _____

2. Location of Main or Head Office _____

3. Proportion of this utility that is locally owned (owners residing in Itasca County?)

4. What was your company's average employment in 1966 (Itasca County operations only)?

<u>Number of Employees</u>		<u>Total</u>
<u>full-time</u>	<u>part-time</u>	<u>Payroll</u>
Itasca County Residents _____		
Non-Itasca County Residents _____		

5. What were your approximate 1966 expenditures for new buildings or additions, including land, and remodeling of existing structures? _____

_____ About how much of this was purchased

outside of Itasca County? _____

6. Approximate 1966 expenditures for new capital equipment, including company cars, trucks, etc.

<u>Kind of Equipment</u>	<u>Total Cost</u>
(a) From within Itasca County _____	

6. (continued)

	<u>Kind of Equipment</u>	<u>Total Cost</u>
	_____	_____
	_____	_____
	_____	_____
	_____	_____

(b) From outside Itasca County _____

7. About how much did you spend in 1966 for rights-of-way and other easements?
_____ About how much of this was spent outside
Itasca County? _____

8. What was your approximate depreciation in plant and equipment in 1966?

9. What was the approximate net value of your 1966 change in inventory?
Gain _____ Loss _____

10. What are your primary sources of capital funds?

(a) Internal funding (from within the company) _____

(b) From banks within Itasca County _____

(c) From public or private agencies within Itasca County other than
banks _____

10. (continued)

(d) From other sources within Itasca County _____

(e) From sources outside of Itasca County _____

11. (a) What were your approximate payments to the Federal Government in 1966 for employer's and employee's share of social security? _____

(b) What were your approximate payments to the Federal Government in 1966 for employee's income taxes withheld? _____

(c) What were your approximate payments of all other kinds to the Federal Government in 1966 (exclusive of the payments in (a) and (b) above)? This would include corporate taxes, business taxes, excise taxes, etc. _____

(d) What were your approximate net payments of all kinds during 1966 to the State Government and its agencies? Include unemployment compensation, sales taxes, excise taxes, etc. _____

(e) What were your approximate total payments of all kinds during 1966 to the County and local Government including school districts? _____

12. What were your approximate outlays in 1966 for the following items? (Please do not show any expenditure more than once.)

	<u>local</u>	<u>outside</u>	<u>total</u>
(a) Costs of goods and merchandise purchased for resale	_____	_____	_____

(b) Costs of materials and general supplies used in the operation of the business but not for resale	_____	_____	_____
--	-------	-------	-------

(c) Costs of maintenance and repair of plant and equipment (except motor vehicles)	_____	_____	_____
--	-------	-------	-------

(d) Rental Costs	_____	_____	_____
------------------	-------	-------	-------

(e) Electricity	_____	_____	_____
-----------------	-------	-------	-------

(f) Heat & Fuel - coal, fuel oil, gas (underline)	_____	_____	_____
---	-------	-------	-------

(g) Telephone and Telegraph	_____	_____	_____
-----------------------------	-------	-------	-------

12. (continued)

- | | <u>local</u> | <u>outside</u> | <u>total</u> |
|---|--------------|----------------|--------------|
| (h) Water & Sewage _____ | | | |
| (i) Insurance (premium payments only--
including hospitalization for employees _____ | | | |
| (j) Finance (interest payments only) _____ | | | |
| (k) Transportation: rail _____ | | | |
| truck _____ | | | |
| other _____ | | | |
| (l) Professional services (accountants,
lawyers, doctors, etc.) _____ | | | |
| (m) Skilled trades and repair services _____ | | | |
| (n) Maintenance and operating costs
of cars, trucks and other vehicles
(except labor) including allowances
for business use of personal cars _____ | | | |
| (o) Office expenses (except labor) _____ | | | |
| (p) Costs of work subcontracted _____ | | | |
| (q) Advertising _____ | | | |
| (r) Contributions to non-profit organizations _____ | | | |
| (s) Retirement or pension fund payments
(employer's share only) _____ | | | |
| (t) Miscellaneous _____ | | | |

13. What were your approximate total 1966 gross receipts from your Itasca County operations only?

14. Could you estimate about what proportion of these came from the following?

- (a) Manufacturing and industrial plants _____
 - (b) Retail stores and other small businesses _____
 - (c) Farms _____
 - (d) Non-profit organizations (such as churches, etc.) _____
- _____

14. (continued)

(e) Household consumers _____

(f) Hunting Camps, Summer Vacation Homes _____

(g) Governmental operations, including schools _____

(h) Other utilities _____

(i) Others (specify) _____

ITASCA COUNTY ECONOMIC STUDY

C O N F I D E N T I A L

For Authorized Personnel Only

University of Minnesota
School of Forestry
St. Paul, Minnesota 55101

Wholesaling
and
Distributing

General Industry Class: _____

Location: _____

Interviewer: _____

1. Is this: (a) the head or main store? _____

Number and location of branch stores _____

(b) Branch store _____

Location of main office _____

2. (For head office only) What proportion of this business is locally owned (owners residing in Itasca County)?

3. What was your store's 1966 average employment?

Number of Employees		Total
part-time	full-time	Payroll

Itasca County Residents _____

Non-Itasca County Residents _____

4. What were your approximate 1966 expenditures for new buildings or additions, including land, and remodeling of existing buildings? _____

_____ About how much of this was purchased outside of Itasca County? _____

5. Approximate 1966 expenditures for new capital equipment, including cars, trucks, etc.

Kind of Equipment	Total Cost
-------------------	------------

(a) From within Itasca County _____

(b) From outside Itasca County _____

6. What was your approximate 1966 depreciation in plant and equipment?

7. What was the approximate value of your 1966 change in inventory?

Gain _____ Loss _____

8. What are your primary sources of capital funds?

(a) Internal funding (from within the Company) _____

(b) From banks within Itasca County _____

(c) From public or private agencies within Itasca County other than banks _____

(d) From other sources within Itasca County _____

(e) From sources outside of Itasca County _____

9. (a) What were your approximate payments to the Federal Government in 1966 for both employer's and employee's share of social security? _____

(b) What were your approximate payments to the Federal Government in 1966 for employee's income tax withholdings? _____

(c) What were your approximate payments of all other kinds to the Federal Government in 1966 (exclusive of the payments in (a) and (b) above? This would include corporate income taxes, business income taxes, excise taxes, etc. _____

(d) What were your approximate net payments of all kinds during 1966 to the State Government and its agencies? Include unemployment compensation, sales taxes, excise taxes, etc. _____

(e) What were your approximate total payments of all kinds during 1966 to the County and local government including school districts? _____

10. What were your approximate outlays in 1966 for the following items? (Please do not show any expenditure more than once)

local outside total

(a) Costs of merchandise purchased for resale (list by broad categories such as lumber, gasoline, etc.) _____

10. (continued)

	<u>local</u>	<u>outside</u>	<u>total</u>
(b) Costs of materials and general supplies used in the operation of the business but not for resale	_____	_____	_____
(c) Costs of maintenance and repair of plant and equipment (except motor vehicles)	_____	_____	_____
(d) Rental costs	_____	_____	_____
(e) Electricity	_____	_____	_____
(f) Heat & Fuel--coal, fuel oil, gas (underline)	_____	_____	_____
(g) Telephone and Telegraph	_____	_____	_____
(h) Water & Sewage	_____	_____	_____
(i) Insurance (premium payments only-- including hospitalization for employees)	_____	_____	_____
(j) Finance (interest payments only)	_____	_____	_____
(k) Transportation: rail	_____	_____	_____
truck	_____	_____	_____
other	_____	_____	_____
(l) Professional services (accountants, lawyers, etc.)	_____	_____	_____
(m) Skilled trades and repair services	_____	_____	_____
(n) Maintenance and operating costs of cars, trucks, and other vehicles (except labor) including allowances for business use of personal cars	_____	_____	_____
(o) Office expenses (except labor)	_____	_____	_____
(p) Advertising	_____	_____	_____
(q) Contributions to nonprofit organizations	_____	_____	_____
(r) Retirement or pension fund payments (employer's share only)	_____	_____	_____
(s) Miscellaneous	_____	_____	_____

11. Approximately what were your total 1966 gross sales at this store?

12. Approximately what proportion were local sales and what proportion retail?

Wholesale Retail

Sales to Itasca County residents or
businesses _____

Sales to Non-Itasca County residents
or businesses _____

13. About what proportion of your total sales would you estimate were to
tourists, hunters, or other non-Itasca County residents here on
vacation?

14. About what proportion of your total sales to Itasca County customers
only were to the following?

(a) Industrial or manufacturing firms _____

What kinds of firms or plants were these in general _____

(b) ~~Retail~~ or service establishments _____

What kinds were these in general _____

(c) Farmers _____

(d) Builders and contractors _____

(e) Utilities _____

(f) Government accounts including schools _____

(g) Non-profit organizations _____

(h) Households or private individuals _____

Appendix C — Three Matrices

Appendix table 1. Itasca County transaction matrix, 1966

SECTOR	PURCHASING		SALES		SERVICES		RENTALS		CONTRACTS		CONSTRUCTION		MANUFACTURING		TRANSPORTATION		COMMUNICATIONS		UTILITIES		REPAIRS		RECREATION		EDUCATION		HEALTH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462



Appendix Table 3. Hasasa County direct-plus-indirect coefficient matrix, 1986

SECTOR	PURCHASING	TIMBER PRODUCTION	TIMBER OPERATIONS	SAWMILLS	AGRICULTURE	FOOD PROCESSING	STONE, CLAY, GLASS & CERAM. MANUFACT.	OTHER INDUSTRIES	CONSTRUCTION	TRANSPORTATION	RECREATION & ENTERTAINMENT	EDUCATION	SECTOR PRODUCING	SECTOR PURCHASING	NON-PROFIT ORGANIZATIONS	PUBLIC SCHOOLS	LOCAL GOV'TS	COUNTY GOV'T	STATE GOV'T	FEDERAL GOV'T	HOUSEHOLDS	OVERSEAS-DEVELOP-MENT
1	1.00014	0.04643	0.00917	0.00052	0.00011	0.00010	0.00029	0.00053	0.00181	0.00004	0.00000	0.00000	1	0.00028	0.00022	0.00015	0.00017	0.00010	0.00010	0.00010	0.00013	0.00012
2	0.00231	1.08306	0.00350	0.00301	0.00432	0.00180	0.00168	0.00168	0.00168	0.00168	0.00168	0.00168	2	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
3	0.00519	0.00390	1.07303	0.00301	0.00395	0.00395	0.00395	0.00395	0.00395	0.00395	0.00395	0.00395	3	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
4	0.01204	0.00811	0.00544	0.00402	0.00798	0.00402	0.00402	0.00402	0.00402	0.00402	0.00402	0.00402	4	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
5	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	5	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
6	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	6	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
7	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	7	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
8	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	8	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
9	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	9	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
10	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	10	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
11	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	11	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
12	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	12	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
13	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	13	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
14	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	14	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
15	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	15	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
16	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	16	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
17	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	17	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
18	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	18	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
19	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	19	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
20	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	20	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
21	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	21	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
22	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	22	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
23	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	23	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
24	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	24	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
25	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	25	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
26	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	26	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
27	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	27	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
28	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	28	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
29	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	29	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
30	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	30	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
31	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	31	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
32	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	32	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
33	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	33	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
34	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	34	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
35	0.02760	0.01966	0.00912	0.00720	0.01233	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	0.00720	35	0.00157	0.00038	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
TOTAL	2.17266	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359	TOTAL	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359	2.19359