ECONOMIC LINKAGES IN THE ECONOMY OF

EUREKA COUNTY
Economic Linkages in the Economy of

Eureka County

Study Conducted by

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ECONOMIC LINKAGES IN THE ECONOMY OF EUREKA COUNTY

EXECUTIVE SUMMARY

Introduction

During the 1980’s and 1990’s Eureka County has realized rapid economic expansion and instability. The primary impetus for this expansion has been the creation and expansion of local gold mining industries. However, most of these gold mining firms are located in northern Eureka County and the employees of these firms live in Elko County, Nevada. Therefore, the impacts to the local economy from increased household expenditures are lost to Elko County.

Understanding the interrelationships of the local economy and impacts of external factors on Eureka County requires knowledge of socioeconomic trends, economic base and economic linkages within the county. Additional knowledge pertaining to the use of economic linkages to estimate impacts on economic activity, employment and income is also helpful. This report provides that information.

Major Findings

- Eureka County’s average annual population growth rate from 1969 to 1995 was fourteenth among the seventeen counties in Nevada. During this twenty-six year period, Eureka County’s average annual percentage growth rate was 2.35%. However, for the last two years of this period, 1993 to 1995, Eureka County’s population growth rate was the lowest of Nevada’s seventeen counties, at −2.06%. During the twenty-six year period, Eureka County was the third highest in population growth instability, and this instability has remained during the last two years of the study period, 1993 to 1995.

- Per capita personal income in 1995 for Eureka County was $23,165, approximately 5% less than the state’s $24,361 and approximately 1% less than the national average of $23,196.

- Approximately 71% of Eureka County’s total income was received from net industry earnings while approximately 29% was in the form of dividends, interest and rents and transfer payments.
• Total personal income in Eureka County realized an average annual growth rate of 2.5% ranking Eureka County fifteenth among Nevada’s seventeen counties for the twenty-six year period from 1969 to 1995. However, for the last two years, 1993 to 1995, real personal income’s average annual percentage growth rate was a -2.16%. Also, during this two year period, Eureka County’s instability ranked it seventh among Nevada’s seventeen counties.

• Approximately 82% of the land in Eureka County is federally owned with the Bureau of Land Management managing approximately 75% of total Eureka County acreage. Local government and private lands make up only 18.17% of Eureka County’s land area.

• In 1990, Eureka County’s median age of population is 35.8 years, which is a little older than the state's median age of 33.3 years.

• In 1990, Eureka County’s level of poverty or percent of families living below the poverty line was 7.4%. This was the fourth lowest value of all of Nevada’s seventeen counties.

• Using location quotient procedures, Eureka County's major export sectors are the agricultural and mining sectors.

• Using shift-share analysis, the mining industry was a major contributor to employment growth in Eureka County. Given that the mining industry throughout the nation lost employment from 1980 to 1990, the increase in mining industry employment for Eureka County signifies the competitive advantage Eureka County experienced for this sector.

• Using shift-share analysis for 1990 to 1995, the major contributor to growth in Eureka County has again been the Mining Sector, however, the Construction Sector has made significant contributions. This is due to the location and expansion of gold mining industries in Eureka County and the additional construction required by the Gold Mining Sector and the demand for local housing.

• If the Alfalfa Hay Sector in Eureka County experienced a ten percent increase in export sales, total economic activity in the county would increase by $0.9 million, while employment and household income would increase by 11 jobs and $0.2 million, respectively.

• The Alfalfa Hay Sector experienced the largest distributional impacts from increased export sales by the Alfalfa Hay Sector. Approximately 71.3% of total economic activity was created by the Alfalfa Hay Sector’s ten percent increase in export sales. Income and employment from the Alfalfa Hay Sector contributed approximately 94.2% and 93.5% respectively.

• Other sectors in Eureka County are also impacted by increased export sales by the Alfalfa Hay Sector. The Transportation, Communication and Public Utilities Sector had 1.29% of total economic activity created by expanding export sales while personal income and emplyment for the Transportation, Communication and Public Utilities was 2.16% and 1.99% respectively.
• If the Gold Mining Sector in Eureka County experienced a ten percent increase in export sales, total economic activity in the county would increase by $72.7 million. Included in this total economic activity increase is approximately $1.1 million in income and 28 jobs.

• The Gold Mining Sector experienced the largest distributional impacts from increased export sales by the Gold Mining Sector. Approximately 97.5% of total economic activity was created by the Gold Mining Sector’s ten percent increase in export sales. Income and employment from the Gold Mining Sector contributed approximately 75.2% and 62.8% respectively.

• Other sectors in Eureka County are also impacted by increased export sales by the Gold Mining Sector. The Construction Sector had 0.38% of total economic activity created by expanding export sales while income and employment for the Construction accounted for 11.09% and 13.69% respectively.

**Interpretation and Implications**

Eureka County, unlike many counties in Nevada, has experienced some population increases and declines and economic growth during the 1980’s and 1990’s. Population growth in Eureka County during this time period has been below the state and national average. Also population and economic growth in Eureka County has been somewhat unstable.

The Eureka County economy is dependent upon the activities of its local mining industry. However, mining operations are impacted by gold prices which are determined by international markets. Any changes in activity by the local mining firms will greatly impact the economy of Eureka County.
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Introduction

From 1990 to 1994, Eureka County experienced a slight increase in population and real per capita income. County real per capita income increased by 1.1 percent while county population increased from 1,550 in 1990 to 1,580 in 1995 or an increase of 1.9 percent. The Eureka County economy, however, is based on a single industry, mining. In 1990 the mining sector made up 85.5 percent of total Eureka County employment which has declined to 82.3 percent of total Eureka County employment. Therefore any changes in mining activity will greatly impact the economy of Eureka County in 1995. Providing information to help local decision makers understand how external factors could impact the Eureka County economy is the primary objective of this study.

The general objective of this study is to perform an interindustry analysis and develop an input-output model for the Eureka County economy. This input-output model calculates the economic interrelationships, more commonly called linkages, between economic sectors in the county economy. These linkages are then used to estimate economic impacts on economic activity, employment, and income in Eureka County from a selected sectoral change in economic activity. Specific objectives are to:

1) Review the basic concept of community economics;
2) Investigate the socioeconomic trends in Eureka County;
3) Analyze the economic base of Eureka County;
4) Determine the economic linkages within Eureka County; and
5) Perform an impact analysis estimating economic impacts on Eureka County from increased export sales in the local Alfalfa Hay and Gold Mining Sectors.

The organization of this report follows the sequence of these specific objectives.
Basic Concepts of Community Economics

Community economics is an applied field of economics that investigates the interrelationships, more commonly called linkages, that exist among economic sectors within a local economy. An overview of a community economic system is presented in Figure 1. Economic sectors shown are basic industries, households and service firms. The linkages that exist among these sectors are depicted by Figure 1.

Basic industries are those industries which produce goods and services primarily for sale outside the economy. These industries are usually involved in agriculture, mining, manufacturing, or casino gaming. Household and service firms support basic industries. Labor is purchased from households and inputs are purchased from service firms. Service firms also provide goods and services to households (consumers). Of course, each of these three sectors purchase products, inputs and labor from outside the community borders. Local transactions determine the relationship that exists among the various types of firms in an economy. These three sectors are also linked with the rest of the economy through inflow and outflow of income, inputs and labor, goods and services and finished products.

The total impact of any basic industry on an economy consists of direct, indirect and induced impacts. Direct impacts are the activities or changes in production level of the impacted industry. Indirect impacts occur in the local business sector as a result of providing inputs to the impacted industry. For example, the increased output of local firms providing inputs for a local mining operation represent the indirect impacts of a basic industry. Induced impacts consist of the economic activity caused by household consumption in a local economy from the direct and indirect effects.

The relationships discussed above indicate how basic industries serve as the foundation of an economy and how households and service firms are necessary to make the economy function. Service industries account for a substantial part of the output of most economies, but, as shown in Figure 1, much of service industry’s output goes to support local basic industries and households. Mathematical techniques, such as input-output analysis, can be used to measure the relationships between basic industries, households and service firms.
Figure 1: Overview of Community Economic System

Basic Industry

Goods & Services

Households

Service Firms

Input & Labor

$
Socioeconomic Trends in Eureka County

Socioeconomic trends within Eureka County are provided to give a socioeconomic perspective of Eureka County in comparison to other Nevada counties, as well as state and national trends. Population, personal income, land ownership, demographics and per capita income trends are identified in this section.

Population

Eureka County is located in Northeast Nevada approximately 115 miles southwest of Elko and 240 miles east of Reno. The county is bordered to the west by Lander County, to the north and east by Elko County, to the east by White Pine County and the south by Nye County. This location is shown in figure 2. Eureka is the county seat and the primary population center for the county. Population was estimated to be 1,580 in 1995 which ranks Eureka County seventeenth of seventeen counties in Nevada. In 1990, Eureka was ranked sixteenth of seventeen Nevada counties. (Nevada State Demographer, 1997)
Figure 2. State of Nevada, Eureka County
Table 1. Population and Rank by Population of Nevada Counties from 1990 to 1995.

<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>Clark</td>
<td>1,192,200</td>
<td>770,280</td>
<td>1</td>
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<tr>
<td>Washoe</td>
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<tr>
<td>Carson City</td>
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<tr>
<td>Elko</td>
<td>43,050</td>
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<tr>
<td>Douglas</td>
<td>35,880</td>
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<tr>
<td>Nye</td>
<td>23,050</td>
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<tr>
<td>Churchill</td>
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<td>18,100</td>
<td>8</td>
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<tr>
<td>Humboldt</td>
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<td>13,020</td>
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<tr>
<td>White Pine</td>
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<td>Mineral</td>
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<tr>
<td>Lander</td>
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<td>6,340</td>
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<td>12</td>
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<td>Pershing</td>
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<td>4,550</td>
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<tr>
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<tr>
<td>Eureka</td>
<td>1,580</td>
<td>1,550</td>
<td>16</td>
<td>16</td>
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</table>

To investigate trends, population growth was estimated from 1969 to 1995 (a twenty-six year period), 1985 to 1995 (a ten year period), 1990 to 1995 (a five year period) and 1993 to 1995 (a two year period). The period 1969 to 1995 was chosen because it aligns with the historical data series provided by the Regional Economic Information System population, employment, and income data (U.S. Department of Commerce, 1997). Also different periods of analysis were analyzed to discern if any changes in trends have occurred.

From Table 2, Eureka County ranked fourteenth among Nevada’s seventeen counties in average annual percentage growth rate. However, Eureka County ranked third highest in instability of population growth during the twenty-six year study period.

For the ten year period from 1985 to 1995, Eureka County ranked fourteenth among Nevada’s seventeen counties in average annual growth rate (Table 3). However, during this ten year period, Eureka County ranked third highest in instability of growth rates.

For the five year time period from 1990 to 1995, average annual growth rate for Eureka County ranked sixteenth among Nevada’s seventeen counties (Table 4). However, during this five year study period, Eureka County had the highest rank in instability of annual growth rates.

From 1993 to 1995, Eureka County was one of three Nevada counties to experience negative average annual population growth rate. The county’s average annual growth rate was the lowest of all seventeen counties in Nevada (Table 5). The instability index for annual growth rates ranked Eureka County as third highest of Nevada’s seventeen counties during this two year study period.
Table 2. County Patterns of Population Growth, Average Annual Percentage Growth and Instability Index, Twenty-Six Year Period (1969-1995).

<table>
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<tr>
<th>County</th>
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Table 4. County Patterns of Population Growth, Average Annual Percentage Growth and Instability Index, Five Year Period (1990 - 1995).

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<th>Average Annual % Change</th>
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<th>Instability Index</th>
<th>County Rank</th>
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<td>Douglas</td>
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Table 5. County Patterns of Population Growth, Average Annual Percentage Growth and Instability Index, Two Year Period (1993 – 1995)

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<th>Average Annual % Change</th>
<th>County Rank</th>
<th>Instability Index</th>
<th>County Rank</th>
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<td>Douglas</td>
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</tr>
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<tr>
<td>Churchill</td>
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<td>10</td>
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<td>12</td>
</tr>
<tr>
<td>Mineral</td>
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<td>13</td>
<td>1.93</td>
<td>4</td>
</tr>
<tr>
<td>White Pine</td>
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<td>14</td>
<td>3.13</td>
<td>2</td>
</tr>
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<td>Lincoln</td>
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<td>15</td>
<td>48.35</td>
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<td>Lander</td>
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<td>16</td>
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<td>1.94</td>
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<tr>
<td>Nevada</td>
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<tr>
<td>United States</td>
<td>1.06</td>
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<td>0.06</td>
<td></td>
</tr>
</tbody>
</table>

Personal Income

In 1995, Eureka County residents received approximately $33.3 million in personal income. Approximately $260.6 million was total earnings in the county in the form of wages and salaries, other labor income, and proprietor’s income. This number is adjusted to net earnings of approximately $23.7 million by taking into account social security contributions and commuting adjustments. Approximately $5.0 million was in the form of unearned income from dividends, interest and rent; and approximately $4.6 million from transfer payments such as social security, food stamps, unemployment payments, and veteran benefits. These income figures are shown in Table 6.

Table 6. Personal Income of Eureka County Residents, 1995

<table>
<thead>
<tr>
<th>Income Category</th>
<th>- - - - ($1,000) - - - -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages and Salaries</td>
<td>216,785</td>
</tr>
<tr>
<td>Other Labor Income</td>
<td>42,409</td>
</tr>
<tr>
<td>Proprietor’s Income</td>
<td>1,426</td>
</tr>
<tr>
<td>Total Earnings in Eureka County</td>
<td>260,620</td>
</tr>
<tr>
<td>Less Personal Social Security</td>
<td>-15,168</td>
</tr>
<tr>
<td>Contributions</td>
<td></td>
</tr>
<tr>
<td>Plus Residence/Commuting Adjustment</td>
<td>-221,712</td>
</tr>
<tr>
<td>Net Earnings of Eureka County</td>
<td>23,740</td>
</tr>
<tr>
<td>Residents</td>
<td></td>
</tr>
<tr>
<td>Dividends, Interest and Rent</td>
<td>5,002</td>
</tr>
<tr>
<td>Transfer Payment</td>
<td>4,592</td>
</tr>
<tr>
<td>Total Personal Income, Eureka County</td>
<td>33,334</td>
</tr>
<tr>
<td>Residents</td>
<td></td>
</tr>
<tr>
<td>Eureka County 1995</td>
<td>23,165</td>
</tr>
<tr>
<td>Per Capita Income (Dollars)</td>
<td></td>
</tr>
</tbody>
</table>


To more accurately measure income available to Eureka County residents before income taxes (a concept called personal income by economists), approximately $15.2 million of personal contributions to social insurance programs such as Social Security, Medicare, Unemployment, etc. paid by residents of Eureka County must be subtracted. Subtracting personal insurance
contributions and resident adjustments leaves net earnings of Eureka County residents of over $23.7 million, or approximately 71 percent of total personal income.

A commuting adjustment is made to total earnings since some people who earn income in Eureka County are not county residents. These people commute into the county to work and take their paycheck back home. Some Eureka County residents also work outside the county and bring income back to the county. The difference between what is earned outside Eureka County and injected back into the county and what is earned in Eureka County and leaves the county is over -$221.7 million. The large negative net residence adjustment factor for Eureka County is due to the Mining Sector workers who work in northern Eureka County but live in Elko.

Table 7 gives the percentage breakdown of Eureka County’s income by source and presents similar data for the state of Nevada and the nation. Eureka County’s breakdown differs from the state of Nevada and nation. Net earnings by residents for Eureka County are approximately 71% of total personal income as opposed to approximately 69% and 66% for the state of Nevada and the United States, respectively. Dividends, interest and rents account for a smaller percentage of total Eureka County income as well as the proportional share of total personal income from transfer payments is lower for Eureka County.

Eureka County’s per capita income is lower than that of the state or nation. At $23,165 Eureka County’s 1995 income per capita was approximately 5% less than the state’s $24,361 and approximately 1% less than the national average of $23,196.
Table 7. Comparison of Personal Income Sources between Eureka County, State of Nevada, and United States, 1995.

<table>
<thead>
<tr>
<th>Personal Income Source</th>
<th>Eureka County (%)</th>
<th>Nevada (%)</th>
<th>United States (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages and Salaries</td>
<td>650.3</td>
<td>60.5</td>
<td>56.1</td>
</tr>
<tr>
<td>Other Labor Income</td>
<td>127.2</td>
<td>6.3</td>
<td>6.9</td>
</tr>
<tr>
<td>Proprietor’s Income</td>
<td>4.3</td>
<td>8.0</td>
<td>7.7</td>
</tr>
<tr>
<td>Less Personal Social Insurance Contributions</td>
<td>-45.5</td>
<td>-4.5</td>
<td>-4.8</td>
</tr>
<tr>
<td>Plus Residence/Commuting Adjustments</td>
<td>-665.1</td>
<td>-1.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Net Earnings of Residents</td>
<td>71.2</td>
<td>68.9</td>
<td>65.9</td>
</tr>
<tr>
<td>Dividends, Interest and Rents</td>
<td>15.0</td>
<td>16.7</td>
<td>17.3</td>
</tr>
<tr>
<td>Transfer Payments</td>
<td>13.8</td>
<td>14.4</td>
<td>16.8</td>
</tr>
<tr>
<td>Total Personal Income</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Per Capita Personal Income</td>
<td>$23,165</td>
<td>$24,361</td>
<td>$23,196</td>
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The twenty-six year pattern of real personal income growth is provided in Table 8. Total personal income for Eureka County had an average annual growth rate of 2.45 percent for the period of 1969 to 1995. This ranks the county fifteenth among Nevada’s seventeen counties. This annual growth rate was lower than the growth rate of the state of Nevada and the national average. Eureka County also ranks the highest of all seventeen Nevada counties according to the instability index. This high instability statistic signifies that Eureka County has had a somewhat unstable economy when compared to other Nevada counties. Being so dependent upon one economic sector contributes to this instability.

Table 8. County Real Personal Income Growth Rate and Instability Index, Twenty Six Year Period (1969 to 1995). a

<table>
<thead>
<tr>
<th>County</th>
<th>Average Annual % Change</th>
<th>County Rank</th>
<th>Instability Index</th>
<th>County Rank</th>
</tr>
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<tbody>
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<td>7.76</td>
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<td>0.60</td>
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<tr>
<td>Storey</td>
<td>6.84</td>
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<td>0.94</td>
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<tr>
<td>Clark</td>
<td>6.70</td>
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<td>Carson</td>
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<td>Lyon</td>
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<tr>
<td>Elko</td>
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<td>Humboldt</td>
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<td>Lander</td>
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</table>

*aReal incomes determined using the Implicit Price Deflator for Personal Consumption Expenditures, 1992 = 100.

The two year pattern of real personal income growth is provided in Table 9. Total real personal income for Eureka County had a negative average annual growth rate of –2.16. Eureka County was one of three Nevada counties that realized negative total personal income growth over the period between 1993 and 1995. The state of Nevada had the highest growth rate of all states in the nation, but as Table 9 shows, this growth was disproportionately shared among Nevada counties. Eureka County ranked sixteenth among Nevada’s seventeen counties in average annual growth rate of real total income from 1993 to 1995. Eureka County also ranked seventh highest in terms of instability of real total personal income growth signifying that during this period Eureka County had fairly unstable growth when compared to other counties in Nevada, the state of Nevada and the nation.
Table 9. County Real Personal Income Growth and Instability Index, Two Year Period (1993 to 1995). \(^a\)

<table>
<thead>
<tr>
<th>County</th>
<th>Average Annual Growth Rate (%)</th>
<th>County Rank</th>
<th>Instability Index</th>
<th>County Rank</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Storey</td>
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</tr>
<tr>
<td>Douglas</td>
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<td>10</td>
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<tr>
<td>Carson City</td>
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<tr>
<td>Washoe</td>
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<td>8</td>
<td>0.18</td>
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<td>Churchill</td>
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<td>United States</td>
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<td>0.17</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Real incomes determined using the Implicit Price Deflator for Personal Consumption Expenditures, 1992 = 100.

Land Ownership

In terms of land area, Eureka County ranks tenth largest in the state with 2,676,718 acres. Approximately eighty-two percent of the land in Eureka County is administered by the federal government with the Bureau of Land Management managing approximately seventy-five percent of total Eureka County acreage. Table 10 shows the proportionate share of total Eureka County acreage by ownership: federal and state government, local government and private ownership. It is of interest that only approximately 18.2 percent of Eureka County acreage is owned by local government and private individuals.


<table>
<thead>
<tr>
<th>Categories</th>
<th>Acreage</th>
<th>Share of Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Agency</td>
<td>Acreage</td>
<td>Share of Total (%)</td>
</tr>
<tr>
<td>Bureau of Land Management</td>
<td>2,019,505</td>
<td>75.44</td>
</tr>
<tr>
<td>Forest Service</td>
<td>144,152</td>
<td>5.39</td>
</tr>
<tr>
<td>Other Federal Agencies</td>
<td>20,302</td>
<td>0.76</td>
</tr>
<tr>
<td>Total Federal Lands</td>
<td>2,183,959</td>
<td>81.59</td>
</tr>
<tr>
<td>State Government</td>
<td>6,400</td>
<td>0.24</td>
</tr>
<tr>
<td>Local Government and Private Lands</td>
<td>486,356</td>
<td>18.17</td>
</tr>
<tr>
<td>TOTAL ACREAGE</td>
<td>2,676,715</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Demographics

Figure 3. Demographic Pyramid for Eureka County

Demographic characteristics of a county refer to the age and gender composition of its residents. Demographic composition changes slowly over time as new residents are added through birth and immigration, and as previous residents are lost through death and outmigration. The demographic composition of an area is important because it determines the makeup of the labor force, the demands for private goods and services and public services, and the ratio of dependents to employed residents. The demographic composition of an area is usually pictured as a pyramid with the number or percent of males on one side and females on the other, and with the youngest age groups at the bottom and oldest at the top. In order to derive a figure showing proportionate population share by age and gender on both sides of the vertical axis, values for the female age groups were shown as negative values. The proportionate shares for females should be recognized as positive values.

Figure 3 shows the demographic pyramid for Eureka County in 1990. The bulge in the middle shows that immigration has been the largest for the 20 to 39 year age group. The immigration phenomena can be explained by the increased level of economic activity by the mining sector. The mining industry provides employment and high wage opportunities, which attract people to Eureka County. As for the 15 to 19 year age group, the outmigration of this age...
group can be attributed to young adults leaving the county for entry level employment opportunities or higher education.

Another aspect of demographics for Eureka County is the median age of population. In Figure 4, the median age for Eureka County is 35.8 years, which is a little older than the state’s median age of 33.3 years.

![Figure 4. Median Age for All Nevada Counties, 1990](image)

The demographic characteristics of Eureka County are somewhat similar to many rural counties in the nation. Often rural counties have higher median age values because the young people with the best education and health, and the most marketable skills and abilities, leave the rural area to realize their potential. With them go some of the area’s future leaders, innovators, and entrepreneurs. Taxes collected in the county, to invest in their education, are now earning dividends for people and economies in other counties and states.
Income

Economic quality of life is difficult to measure because of differences in cost of living and non-monetary income between locations. However, per capita income is still an important basis for comparing economic quality of life, especially among geographically similar areas. On this basis, the economic quality of life in Eureka County was relatively high in 1990. In Figure 5, the per capita income of each county is shown and in comparison to Eureka County, the counties of Douglas, Esmeralda, and Washoe had higher per capita incomes.

Figure 5. Per Capita Income All Counties, 1990

Another useful measure of economic quality of life is the percent of households below the poverty line. From Figure 6, Eureka County in 1990 had shown a level of poverty that was lower than many of Nevada’s other counties. The percentage of families living below the poverty line in Eureka County in 1990 was 7.4 percent. This ranked Eureka County as the fourth lowest county in percent of families below the poverty line. As comparison, the percentage of families living
below the poverty line was 7.3 percent for the state, while the nation’s percentage of families living below the poverty line was 10.0% in 1990.

Figure 6. Percent of Households Below Poverty Line, 1990
The Economic Base of Eureka County

The economic base of a county refers to the relative size of its industries. A county is said to have a diversified economic base if several industries are relatively large. Conversely, if one or a few industries dominate a local economy, the economy is said to have a concentrated economic base. There are two techniques used to measure economic base and changes in economic base. These are location quotient analysis and shift-share analysis.

Location Quotient Analysis

The degree of concentration of Eureka County industries is determined by calculating location quotients for individual economic sectors. Location quotients indicate the economic importance of each regional industry relative to the same industry at the national level. Location quotients usually use employment as an indicator of an industry’s size and importance. The primary focus of location quotients is to identify the industries which are either more important or less important locally than nationally. The broader the economic base, that is, the higher the location quotients, the more stable the economy of a community. On the other hand, very low location quotients represent industries that are largely underdeveloped and may offer an opportunity for future development.

An industry’s location quotient is the ratio of the industry’s share of employment in the county to the industry’s share of employment in the nation. It is calculated as follows:

\[
LQ_i = \frac{e_i / E}{n_i / N}
\]

where:

- \( i \) = Economic Sector
- \( LQ_i \) = Location quotient for economic sector i
- \( e_i \) = County employment in economic sector i
- \( E \) = Total county employment
- \( n_i \) = National employment in economic sector i
- \( N \) = Total national employment
The interpretation of location quotients are as follows:

1. Every industry’s output can be divided into two uses: export and local consumption (use).
2. The amount consumed (used) by an community is proportionate to the amount consumed locally.
3. If the location quotient for an economic sector is less than one, goods and services must be imported to satisfy local demands.
4. If the location quotient for an economic sector is equal to one, then the economy is approximately fulfilling the requirements of the local household and firms.
5. Finally, if the location quotient is greater than one, for that particular economic sector, the community is producing more than it consumes and is capable of exporting excess goods for the purposes of bringing income into the community.

Results of Location Quotient Analysis

Location quotients shown in Table 11 were derived from employment levels in each economic sector at county and national levels from the U.S. Department of Commerce, Regional Economic Information System, for 1990 and 1995.

Given the interpretation of location quotients, economic sectors in Eureka County can be classified as export sectors (that is, they market much of their output outside the county in which they are located) or import industries (that is, a large portion of the demand for goods and services is satisfied by producers outside the county).

The location quotient analysis for Eureka County’s economic base for 1990 and 1995 indicates that the county is highly dependent on Mining, and Agricultural Sectors. The Mining Sector had the highest location quotient value of 143.92 in 1995 showing the importance of the Mining Sector to the local economy. Also, because of disclosure problems the Agriculture Services; Manufacturing; Transportation Communication and Public Utilities; Wholesale Trade; and Finance, Insurance and Real Estate Sectors were aggregated into a single sector.
Table 11. Location Quotient Analysis Results for Eureka County, 1990 and 1995.

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Location Quotient 1990</th>
<th>Location Quotient 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1.48</td>
<td>1.18</td>
</tr>
<tr>
<td>Mining</td>
<td>114.69</td>
<td>143.92</td>
</tr>
<tr>
<td>Construction</td>
<td>0.35</td>
<td>1.20</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>0.11</td>
<td>0.12</td>
</tr>
<tr>
<td>Services</td>
<td>0.08</td>
<td>0.05</td>
</tr>
<tr>
<td>Federal, Civilian and Military</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>State Government</td>
<td>0.19</td>
<td>0.20</td>
</tr>
<tr>
<td>Local Government</td>
<td>0.42</td>
<td>0.55</td>
</tr>
<tr>
<td>Aggregate (^1)</td>
<td>0.04</td>
<td>0.04</td>
</tr>
</tbody>
</table>


\(^1\) Because of disclosure problems the Agricultural Services; Manufacturing; Transportation Communication and Public Utilities; Wholesale Trade; and Finance, Insurance and Real Estate Sectors were aggregated into one sector denoted as the Aggregate Sector.

From Table 11, Eureka County imports much of its goods and services. The location quotient analysis can be used to target new industries or businesses for the county and to develop economic strategies for the future. One strategy, for example, might be to encourage the location of input suppliers for the mining and/or agricultural sectors. Also strategies to strengthen the local retail sector to reduce retail sales leakages may be another appropriate economic development strategy.
The Changing Economic Base of Eureka County

The location quotient results indicate the nature of the area’s economy for a specific time period. Of additional interest is the change occurring in the county’s economic base. Shift-share analysis is performed to measure these changes.

Shift-share analysis, like location quotients, is a measure of a county’s economic condition relative to other communities and to the nation as a whole. The data used in this analysis are the same as that used for the location quotient analysis. For this study, the shift in economic base was studied from 1980 to 1990 and 1990 to 1995.

The purpose of shift-share analysis is to determine the county’s competitiveness and changing employment patterns in the industrial market place. Shift-share analysis assumes that there are three components to changes in employment: national growth, industrial mix and competitive share.

National Growth Component

The sum of employment in all industries in all communities makes up national employment. One would expect that if a community’s economy was maintaining its relative competitiveness, changes in the level of national employment would be reflected in proportionately equal changes in the local employment. The calculation of the national growth component, therefore, measures how much of the local employment change is due to the national growth trend. The calculation is as follows:

National Growth Component = (rate of change in $N * e_i$)

where:

rate of change in nation or $N = \frac{(N_{1990} - N_{1990})}{N_{1980}}$

e$_i$ = county employment in economic sector $i$

Industrial Mix Component

On a national level, each industry grows or declines at some rate, at least partially independent of the rate of growth in the national economy. A local economy’s performance will depend, on its mix of industries, that is, on whether its economic base is concentrated in faster or
slower growing industries. The industrial mix calculation indicate the expected growth in local industries if they grow at the same rate as their national counterparts. The expected local share of the particular industry is determined using the following equation:

\[ \text{Industrial Mix Component} = (\text{rate of change in } n_i - \text{rate if change N}) \times e_i \]

- \(n_i\) = national employment in economic sector i
- \(N\) = total national employment
- \(e_i\) = county employment in economic sector i

rate of change in \(n_i\) = \(\frac{n_{1990} - n_{1980}}{n_{1980}}\)

**Competitive Share Component**

A local industry’s employment grows or declines for a number of reasons, including changes in the national employment level, changes in employment by the same industry at the national level, and changes in local conditions. After the first two components have been calculated, the residual change, if any, is attributed to changes in the competitiveness of the local industry. The competitive share component measures this latter factor in employment change. The competitive share component is measured as follows:

\[ \text{Competitive Share} = (\text{rate of change in } e_i - \text{rate of change in } n_i) \times e_i \]

where:

- \(e_i\) = county employment in economic sector i

rate of change in \(e_i\) = \(\frac{e_{i1990} - e_{i1980}}{e_{i1980}}\)

rate of change in \(n_i\) = \(\frac{n_{i1990} - n_{i1980}}{n_{i1980}}\)

**Results of Shift-Share Analysis**

A local industry’s employment grows or declines for a number of reasons, including changes in the national employment level, changes in employment by the same industry at the national level, and changes in local conditions. After the national component and industrial mix component have been calculated, the residual change, if any, is attributed to changes in the
competitiveness of the local industry. Tables 12 and 13 show the results of the shift-share analysis for Eureka County for the periods 1980 to 1990 and 1990 to 1995.

From Table 12, Eureka County overall employment increased by 3,242 from 1980 to 1990. The Mining Sector was by far the leading economic sector in growth with the Mining Sector accounting for approximately ninety-nine percent of total county growth from 1980 to 1990. Nationally, mining lost employment from 1980 to 1990. However, the competitive advantage of the Mining Sector in Eureka County provided for most of the overall employment growth in Eureka County.

For the Retail Sector, national and industrial mix growth rates contributed to positive growth in this local sector. However, the negative competitive share contributed to overall decline in retail trade. An economic development strategy would be to investigate the causes for this negative competitive share and if possible correct the non-competitiveness of this sector.

From Table 13, overall employment in Eureka County increased by 624 jobs from 1990 to 1994. The Mining and Construction Sectors contributed most to growth in Eureka County. This is due to expanded mining operations and construction related to mining operations and housing. As opposed to Table 12, the Retail Trade Sector realized employment growth during 1990 to 1995 and had a positive competitive share during this five year period. However, the Service Sector realized employment loss from 1990 to 1995 and had the largest negative Competitive Share of all economic sectors in Eureka County.

Overall, Eureka County realized employment growth between 1980 and 1990 and from 1990 to 1995. National growth component impacted Eureka County employment positively for these two study periods. For both time periods, the Mining Sector was a major contributor to county employment growth. Analyzing results of both the location quotients and shift-share analysis, Eureka County is highly dependent on the Mining Sector. By diversifying the economic base of Eureka County, it may be possible to lower cyclical swings in the local economy. However, in pursuing the goal of economic diversification, the goal of economic growth must also be addressed.

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>National Component</th>
<th>Industrial Mix</th>
<th>Competitive Share</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>44</td>
<td>-78</td>
<td>-25</td>
<td>-59</td>
</tr>
<tr>
<td>Mining</td>
<td>80</td>
<td>-146</td>
<td>3,278</td>
<td>3,212</td>
</tr>
<tr>
<td>Retail</td>
<td>23</td>
<td>6</td>
<td>-62</td>
<td>-33</td>
</tr>
<tr>
<td>Services</td>
<td>16</td>
<td>23</td>
<td>-21</td>
<td>18</td>
</tr>
<tr>
<td>Federal Government, Military and Civilian</td>
<td>2</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>State Government</td>
<td>0</td>
<td>0</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Local Government</td>
<td>22</td>
<td>-8</td>
<td>21</td>
<td>35</td>
</tr>
<tr>
<td>Aggregate &lt;sup&gt;1&lt;/sup&gt;</td>
<td>20</td>
<td>-10</td>
<td>36</td>
<td>46</td>
</tr>
<tr>
<td>TOTAL</td>
<td>207</td>
<td>-214</td>
<td>3,249</td>
<td>3,242</td>
</tr>
</tbody>
</table>


<sup>1</sup> Because of disclosure problems the Agricultural Services; Manufacturing; Transportation Communication and Public Utilities; Wholesale Trade; and Finance, Insurance and Real Estate Sectors were aggregated into one sector denoted as the Aggregate Sector.
<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>National Component</th>
<th>Industrial Mix</th>
<th>Competitive Share</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>34</td>
<td>-40</td>
<td>40</td>
<td>-34</td>
</tr>
<tr>
<td>Mining</td>
<td>874</td>
<td>-1,246</td>
<td>763</td>
<td>391</td>
</tr>
<tr>
<td>Construction</td>
<td>19</td>
<td>-19</td>
<td>197</td>
<td>197</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>18</td>
<td>-16</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Services</td>
<td>22</td>
<td>64</td>
<td>-102</td>
<td>-16</td>
</tr>
<tr>
<td>Federal Government, Civilian and Military</td>
<td>2</td>
<td>-3</td>
<td>-2</td>
<td>-3</td>
</tr>
<tr>
<td>State Government</td>
<td>6</td>
<td>-5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Local Government</td>
<td>33</td>
<td>-27</td>
<td>52</td>
<td>58</td>
</tr>
<tr>
<td>Aggregate (^1)</td>
<td>15</td>
<td>-32</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1023</td>
<td>-1,324</td>
<td>925</td>
<td>624</td>
</tr>
</tbody>
</table>


\(^1\) Because of disclosure problems the Agricultural Services; Manufacturing; Transportation Communication and Public Utilities; Wholesale Trade; and Finance, Insurance and Real Estate Sectors were aggregated into one sector denoted as the Aggregate Sector.
Interindustry Analysis

Within a regional economy, there are numerous economic sectors performing different tasks. All sectors are dependent on each other to some degree. A change in activities will directly or indirectly affect the response or level of production of the other regional sectors. The amount of economic activity among economic sectors shows the degree of interrelationships or linkages between sectors. That is, an increase in production by the regional Livestock Sector would directly increase purchases of alfalfa hay. With increased alfalfa hay purchases, farm workers will have greater incomes which would increase their purchases from the Trade Sector. The Trade Sector would experience increased economic activity because of its indirect relationship with the Livestock and Alfalfa Hay Sectors. These interdependencies among regional economic sectors can be estimated through interindustry analysis.

Transaction Table

An interindustry analysis is based on the transactions of the sectors in an economy, i.e., purchases of inputs and sales of outputs. A transaction table present in Figure 7 shows the monetary flows of goods and services through a regional economy. Transactions can be delineated into four major classifications. One classification (Quadrant I) is the processing section which produces goods and services. Processing sectors in Quadrant I produce and buy products and/or services from other processing sectors to be used in their production process. Goods and services used in the processing section are intermediate goods which are used in the production of goods and services which are ultimately sold to final consumers.

Another classification (Quadrant II) includes sales to final demand of goods and services. The Final Demand Section includes net inventory change, exports, government purchases, capital formation and purchases by households. The third classification (Quadrant III) is the Final Payment Section. The Final Payments Section includes the non-processing supply sectors such as imports, depreciation, and households. Quadrant IV represents direct inputs of final demand which are not produced by industries in the processing sector.
Transactions include costs and revenues concerning an economic sector. First, reading down the column of the transactions table, the inputs (cost) required by a specific sector from other specific sectors to produce its output can be seen. Second, reading across the row of the transactions table, the distribution of sales by a specific sector to other sectors can be seen.

In Figure 7, a total of n industries are listed across the top and on the left hand side of Quadrant I. For a given industry i, reading across the row gives the sales of that sector to all other sectors in the regional economy. For example, the values in the cell where row i intersects with column j ($x_{ij}$) represents the sales of sector i to sector j. The sales of sector i to j are also purchases of sector j from sector i.

<table>
<thead>
<tr>
<th>Output</th>
<th>Sector 1. . . . . j . . . . n</th>
<th>Final Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i</td>
<td>$X_{ij}$</td>
<td></td>
</tr>
<tr>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Final Payments |                               |              |
|               |                               |              |
|               | Quadrant III                  |              |
|               | (Final Payments Section)      |              |
|               |                               |              |

| Total Gross Input | |
|-------------------| |

| Total Gross Output | |

$X_{i}$

$X_{j}$

Figure 7. A Classification of Transactions
Direct Requirements

The logic of interindustry analysis is to establish the structural relationships among the processing sectors of the model. These relationships can be seen throughout the direct requirements table. A direct requirement coefficient is computed from the processing section (Quadrant I) of the transaction table by dividing the value in a column cell by total output of the column. This can be expressed as:

\[ a_{ij} = \frac{x_{ij}}{X_j} \quad i, j = 1, 2, \ldots, n \]

where \( a_{ij} \) is the purchase by sector \( j \) from sector \( i \) to produce one dollar of output by sector \( j \), \( x_{ij} \) is the dollar value of transactions between sector \( i \) and sector \( j \), and \( X_j \) is the value of total output for sector \( j \).

The \( a_{ij} \) is a direct requirement coefficient which shows how much a given sector purchases from another sector within the same regional economy in order to produce one dollar’s worth of output. Direct requirement coefficients are only calculated for the processing sectors.

The column sum of the direct requirements coefficients of a given sector show the direct effects of changes in the volume of output of a given sector upon other sectors of the economy. The direct effect or “first round” effects show how much a given sector has to increase its purchases of output from other processing sectors when there is an increase in demand for the output of the given sector.

Final Demand Interindustry Coefficients

Due to the direct effect of additional output for a given industry, other processing sectors must supply additional inputs. To supply these additional outputs, the directly affected sectors must increase their output levels which means increased purchases from their input supply sectors. This expansion of output by sectors directly and indirectly related to the principal sector that increased its output to meet final demand sales is referred to as a final demand interindustry coefficient. The column sum of final demand interindustry coefficients derives the final demand multiplier for a given economic sector. The final demand multiplier estimates the increase in regional economic activity required for a particular economic sector to increase sales to final demand by one dollar.
Final demand multipliers are calculated for both “open” and “closed” input-output models. An “open” model does not contain a non-processing sector in the processing section of the transaction table. The final demand multiplier of an “open” model derives both direct and indirect effects of a one dollar increase in sales to final demand for a given sector. Indirect effects being those increases in levels of output for the regional economy to meet the output levels of the directly related industries.

A “closed” input-output model contains at least one non-processing sector in the processing section of the transactions model. Usually the Household Sector is incorporated into the processing section of the transactions table to produce a closed model. The final demand multiplier from a “closed” model derives direct, indirect, and induced effects from a one dollar increase in sales to final demand for a given sector. Induced effects are the effects of new incomes to households upon the individual sectors of the economy from increased sales to final demand by a given sector.

**Output Interindustry Coefficients**

Final demand interindustry coefficients derive the effects to the regional economy from sales to final demand for a given sector. In order to meet these final demand sales, the given sector must increase production by purchases from itself. This intrasectoral purchasing increases output response greater than one. In order to estimate economic effects from total production rather than from deliveries outside the processing sectors, output interindustry coefficients are required.

Output interindustry coefficients are calculated by dividing each column entry in the final demand interindustry coefficient matrix by the given sector’s intrasectoral interindustry coefficient. This will derive intrasectoral coefficients equal to one. The other entries in the final demand interindustry coefficients matrix are adjusted similarly to refer to production rather than external end product deliveries by dividing all entries in each row by the entry at the intersection with the corresponding column or the intrasectoral coefficient.

Direct and indirect output multiplier coefficients are derived from an “open” model. Indirect effects being the increased purchases in the regional economy created by the purchases of the directly affected sectors from a given sector’s increase in production. Direct, indirect, and
induced output interindustry coefficients are derived from a “closed” model. Induced effects being the increase in regional economic activity from increase in household incomes created by production increases for a given sector.

**Employment Effects**

Interindustry analysis is used to determine the effects on the regional economy from changes in a given sector’s level of output or sales to final demand. Interindustry analysis also can be used to derive the effects on regional employment from changes in a given sector’s sales to final demand or output level. Studies by Elrod and Laferney (1972) and Osborn et al. (1973) have derived procedures to determine regional employment impacts from input-output models.

To determine employment effects, it is first required that the direct labor effects for each of the n processing sectors be derived, or:

\[ L_j = \frac{E_j}{X_j} \quad j = 1, 2, \ldots, n \]

where \( L_j \) is the number of employees required per dollar of output by sector \( j \); \( E_j \) is the number of workers employed by sector \( j \); and \( X_j \) is the dollar value of production by sector \( j \).

From the direct employment requirements vector for each processing sector in the region, direct and indirect labor requirements from a one dollar sales to final demand by a given sector can be derived by premultiplying the direct labor coefficients matrix by the “open” final demand interindustry coefficient matrix. Indirect labor effects are the number of workers employed elsewhere in the regional economy to produce the direct and indirect inputs used by each sector.

Premultiplying the direct labor requirements matrix by the “closed” interindustry coefficients matrix derives the direct, indirect, and induced employment effects in the region from a given sector’s change in sales to final demand interindustry coefficients matrix. Direct and indirect employment effects and direct, indirect, and induced employment effects from changes in a given sector’s level of output can be derived from the “open” or “closed” output interindustry coefficients matrix.
**Household Income Effects**

The effects on regional household incomes from changes in sectoral sales to final demand and levels of output can be derived through interindustry analysis. If households are exogenous to the model, that is an “open” model, the derivation of direct and indirect household income effects requires the determination of a direct household income vector. The direct household income vector is the division of the Household Sector row value for each processing sector. Direct and indirect household income effects from changes in sales to final demand by a given sector are derived by multiplying the direct household income requirements by the “open” final demand interindustry coefficient matrix. The indirect income effects are those increases in regional income created by increased production activities from those sectors indirectly related to the direct resources supply sectors.

When the Household Sector is made endogenous to the processing section or what is referred to as a “closed” model, direct, indirect, and induced household income effects are derived. Induced income effects are the changes in regional incomes created by the additional purchases of regional households created by the change in a given sector’s sale to final demand. Direct, indirect, and induced household income effects can be read directly off the “closed” final demand interindustry coefficients matrix. The coefficients are the values from the household row in the interindustry coefficients matrix for each given processing sector. Using the output interindustry coefficients matrix, the effects on household income from changes in a given sector’s level of production can be derived.

**Economic Linkages in Eureka County**

An input-output model for Eureka County was developed using the microcomputer IMPLAN model and supplemented by primary data at the local level. The Micro IMPLAN model was developed by the U.S. Forest Service to estimate sectoral and regional impacts of alternative forest management scenarios (Alward et al. 1989). The update and further development of the Micro IMPLAN has been conducted by the Minnesota IMPLAN Group, Inc. (1997).

County input-output models can be developed from either primary or secondary data. County input-output models derived through primary data sources are time consuming and very
costly. Secondary data procedures use publicly available data sources to estimate county level interindustry models from the national input-output model. IMPLAN uses regional purchase coefficients to estimate regional or county level input-output models. Numerous studies have examined differences between primary and secondary data input-output models (Round, 1983; Schaffer and Chu, 1969; Stevens et al., 1983). Studies have shown differences between these models when compared to primary models, semi-survey models provide the best model (Miller and Blair, 1985).

The input-output model developed for Eureka County is a semi-survey model. An IMPLAN model for Eureka County was first developed. The IMPLAN model was modified through production data for the Eureka County economic sectors. In addition, employment data used by IMPLAN was verified using employment data supplied by the Nevada Department of Employment, Training and Rehabilitation. For this analysis, the Local Government Sector and the Household Sector were closed to the processing section. A listing of the economic sectors used in the analysis are shown in Appendix A and an listing of data sources used for this semi-survey model are shown in Appendix B.

Transactions Table

The transactions table for Eureka County is based on 1990 data and shown in Table 14. A transactions table shows the dollar flow of goods and services throughout the county economy. Total sectoral output of the processing sectors in Eureka County indicate the relative importance of the various sectors in terms of volume of dollar activity. Total output for the processing sectors ranges from $468 thousand for the Transportation, Communication and Public Utility Sectors to $709.5 million for the Gold Mining Sector.

Row values of a given economic sector show the distribution of sales by that sector. For example, the Trade Sector (Row 9) sold roughly $24 thousand of output to the Livestock Sector (Column 1). Intraindustry (intrasectoral) transactions occur when firms sell to other firms in the same sector. The Livestock Sector (Row 1) sold $450.0 thousand of output to other ranchers in the Livestock Sector (Column 1). As for the Trade Sector (Row 9) this sector had sales to the Household Sector of $147 thousand or the local Household Sector made up 5.1 percent of total sales by the Trade Sector.
Table 14 shows that a large portion of the output in Eureka County was sold to buyers outside the region. For example, the Gold Mining Sector (Row 5) sells $709.4 million (99.9 percent of total output) of its output to buyers outside the region. Other sectors also have large exports sales such as the Livestock Sector with $3.5 million or 88.1 percent of total output, and the Alfalfa Hay Sector with export sales of $5.5 million or 78.9 percent of total sectoral output.

Purchases of specific inputs by a given processing sector can be analyzed by moving down the column entries of a given sector in Table 14. For example, the Livestock Sector (Column 1) purchases $390 thousand of inputs from the Other Hay Sector (Row 4) and $24 thousand of services from the Transportation, Communication and Public Utilities Sector (Row 8).

Firms in the region purchase some of their inputs from sellers outside the region. The dollar amount of imports by each sector is included in the Imports Sector (Row 15). The Livestock Sector (Column 1) purchases $820 thousand of inputs from sellers outside Eureka County or 20.8 percent of total sectoral inputs. Other sectors can be analyzed in much the same fashion from the transactions table which gives the dollar flows in the regional economy.

**Direct Requirements**

The dollar values of all inputs used by a sector to produce one dollar of output are called direct requirements. Direct requirements by a sector have been referred to as a “production recipe” to produce a dollar of output. That is, the direct requirements by a sector to produce one dollar of output is the required purchases of inputs from each selling sector.
<table>
<thead>
<tr>
<th>Sectors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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</thead>
<tbody>
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<td></td>
<td>Livestock ($1,000)</td>
<td>Alfalfa Hay Production ($1,000)</td>
<td>Timothy Hay Production ($1,000)</td>
<td>Other Hay Production ($1,000)</td>
<td>Gold Mining ($1,000)</td>
<td>Other Mining ($1,000)</td>
<td>Construction ($1,000)</td>
<td>T.C and Public Utilities* ($1,000)</td>
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<td>0</td>
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<td>3. Timothy Hay Production</td>
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<td>0</td>
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<td>1,465</td>
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<td>0</td>
<td>0</td>
<td>2,305</td>
<td>2,391</td>
<td>1,465</td>
<td>10</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>71</td>
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<td>4</td>
<td>3,055</td>
<td>412</td>
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<td>709,497</td>
<td>80,237</td>
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1. Transactions table shows the dollar flows of goods and services between economic sectors in a local economy.

Table 14. Continued

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<tr>
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<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
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<td>Trade ($1,000)</td>
<td>Eating, Drinking and Lodging ($1,000)</td>
<td>Service ($1,000)</td>
<td>Local Government ($1,000)</td>
<td>Households ($1,000)</td>
<td>Other Final Payment ($1,000)</td>
<td>Imports ($1,000)</td>
<td>Row Total ($1,000)</td>
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<td>6,981</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>4,410</td>
<td>4,410</td>
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<tr>
<td>4. Other Hay Production</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>387</td>
<td>780</td>
</tr>
<tr>
<td>5. Gold Mining</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>709,497</td>
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<td>2</td>
<td>7</td>
<td>13</td>
<td>85</td>
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<td>1</td>
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<td>2</td>
<td>7</td>
<td>468</td>
<td>225</td>
<td>17</td>
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<td>9,536</td>
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</tbody>
</table>

Column Totals: 2,884 1,373 4,517 9,536 33,908 N.A. N.A. N.A.

\(^1\) Transactions table shows the dollar flows of goods and services between economic sectors in a local economy.

\(^2\) T.C & P.U. represents the Transportation, Communication and Public Utilities Sector.
Table 15. Direct Requirements

<table>
<thead>
<tr>
<th>Sectors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Livestock</td>
<td>Alfalfa Hay Production</td>
<td>Timothy Hay Production</td>
<td>Other Hay Production</td>
<td>Gold Mining</td>
<td>Other Mining</td>
<td>Construction</td>
</tr>
<tr>
<td>1. Livestock Production</td>
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<td>0.000000</td>
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</tr>
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<td>0.099991</td>
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<td>0.000000</td>
<td>0.000000</td>
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<td>0.000000</td>
</tr>
<tr>
<td>3. Timothy Hay Production</td>
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<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>4. Other Hay Production</td>
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<td>0.000000</td>
<td>0.000000</td>
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<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>5. Gold Mining</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>6. Other Mining</td>
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<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>7. Construction</td>
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<td>0.000000</td>
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<td>0.000000</td>
<td>0.000000</td>
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</tr>
<tr>
<td>8. T.C. &amp; P.U.</td>
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<td>0.002778</td>
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<td>1.000000</td>
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</tr>
</tbody>
</table>

1 Direct Requirements table shows the dollar value of all inputs that are required to produce one dollar of output by a given economic sector.
2 T.C & P.U. represents the Transportation, Communication and Public Utilities Sector.
<table>
<thead>
<tr>
<th>Sectors</th>
<th>8 T.C and Public Utilities</th>
<th>9 Trade</th>
<th>10 Eating, Drinking and Lodging</th>
<th>11 Services</th>
<th>12 Local Government</th>
<th>13 Households</th>
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</thead>
<tbody>
<tr>
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<td>3. Timothy Hay Production</td>
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<td>0.001496</td>
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</table>

1 Direct Requirements table shows the dollar value of all inputs that are required to produce one dollar of output by a given economic sector.
2 T.C & P.U. represents the Transportation, Communication and Public Utilities Sector.
Direct requirements shown in Table 15 are calculated by dividing each purchase transaction for a given sector by its total output. Direct requirements provide estimates of the dollar value of inputs that are required to produce one dollar of output by the producing sector. For example, to produce one dollar of output, the Livestock Sector (Column 1) purchases $0.099 from the Other Hay Sector (Row 4), $0.006 from the Trade Sector (Row 9) and $0.005 from the Services Sector (Row 11).

The total of the direct requirements for a sector is $1. That is, to produce one dollar of output, all of the payments for the resources used in production are equal to one dollar since profits are considered as part of total inputs. For the Livestock Sector (Column 1), input requirements from local economic sectors is $0.79 while $0.21 are imported to produce one dollar of output.

Final Demand Interindustry Coefficients

The direct requirements provide estimates of the direct response of the processing sector in Eureka County economy to expansion of output by a given sector by one dollar. The processing sectors that respond to the direct requirement of a given sector will expand their output by purchasing inputs from other processing sectors. The direct effects plus the resulting indirect effects from increased sales to final demand are called final demand coefficients from an “open model.” For this study, the Local Government Sector and the Household Sector were included as processing sectors to derive direct, indirect and induced effects.

The interdependencies or linkages between and among economic sectors in Eureka County are derived and provided in Table 16. For example, when the Livestock Sector in Eureka County increases sales to final demand, i.e., expansion of export sales, the Livestock Sector requires an estimated increase in output from the Trade Sector (Sector 9) of $0.0091. Direct requirements by the Livestock Sector given in Table 15 cause the Trade Sector to increase output by $0.0061. The indirect and induced effects on the Trade Sector to support an increase of one dollar in sales to final demand by the Livestock Sector is $0.0030 ($0.0091 less $0.0061). In other words, $0.0030 of business activity was required from the Trade Sector to supply all trade services demanded by processing sectors in response to the requirements of the Livestock Sector to produce one dollar of additional output for final demand.
Table 16. Final Demand Total Requirements

<table>
<thead>
<tr>
<th>Sectors</th>
<th>1 Livestock</th>
<th>2 Alfalfa Hay Production</th>
<th>3 Timothy Hay Production</th>
<th>4 Other Hay Production</th>
<th>5 Gold Mining</th>
<th>6 Other Mining</th>
<th>7 Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Livestock Production</td>
<td>1.129119</td>
<td>0.000029</td>
<td>0.000014</td>
<td>0.000024</td>
<td>0.000001</td>
<td>0.000002</td>
<td>0.000037</td>
</tr>
<tr>
<td>2. Alfalfa Hay Production</td>
<td>0.158761</td>
<td>1.111130</td>
<td>0.068405</td>
<td>0.000025</td>
<td>0.000001</td>
<td>0.000002</td>
<td>0.000038</td>
</tr>
<tr>
<td>3. Timothy Hay Production</td>
<td>0.000005</td>
<td>0.000005</td>
<td>1.000002</td>
<td>0.000004</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000006</td>
</tr>
<tr>
<td>4. Other Hay Production</td>
<td>0.111902</td>
<td>0.000024</td>
<td>0.000012</td>
<td>1.000020</td>
<td>0.000001</td>
<td>0.000002</td>
<td>0.000030</td>
</tr>
<tr>
<td>5. Gold Mining</td>
<td>0.000287</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.002564</td>
<td>1.000000</td>
<td>0.000844</td>
<td>0.000000</td>
</tr>
<tr>
<td>6. Other Mining</td>
<td>0.000007</td>
<td>0.000009</td>
<td>0.000004</td>
<td>0.000005</td>
<td>0.000566</td>
<td>1.010648</td>
<td>0.000103</td>
</tr>
<tr>
<td>7. Construction</td>
<td>0.011020</td>
<td>0.002422</td>
<td>0.001591</td>
<td>0.001492</td>
<td>0.003941</td>
<td>0.033946</td>
<td>1.113279</td>
</tr>
<tr>
<td>8. T.C. &amp; P.U.</td>
<td>0.011119</td>
<td>0.020050</td>
<td>0.008879</td>
<td>0.003645</td>
<td>0.000051</td>
<td>0.01955</td>
<td>0.002283</td>
</tr>
<tr>
<td>9. Trade</td>
<td>0.009081</td>
<td>0.002887</td>
<td>0.001583</td>
<td>0.002220</td>
<td>0.000085</td>
<td>0.000986</td>
<td>0.004960</td>
</tr>
<tr>
<td>10. Eating, Drinking and</td>
<td>0.001114</td>
<td>0.001023</td>
<td>0.000512</td>
<td>0.000842</td>
<td>0.000040</td>
<td>0.000068</td>
<td>0.001283</td>
</tr>
<tr>
<td>Lodging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Services</td>
<td>0.009938</td>
<td>0.011591</td>
<td>0.006863</td>
<td>0.004534</td>
<td>0.000104</td>
<td>0.001097</td>
<td>0.004212</td>
</tr>
<tr>
<td>12. Local Government</td>
<td>0.030265</td>
<td>0.011547</td>
<td>0.012516</td>
<td>0.007612</td>
<td>0.004650</td>
<td>0.005726</td>
<td>0.006013</td>
</tr>
<tr>
<td>13. Households</td>
<td>0.432470</td>
<td>0.398130</td>
<td>0.198924</td>
<td>0.330075</td>
<td>0.015769</td>
<td>0.026132</td>
<td>0.502934</td>
</tr>
<tr>
<td>Column Totals</td>
<td>1.905088</td>
<td>1.558847</td>
<td>1.299307</td>
<td>1.353062</td>
<td>1.025211</td>
<td>1.081409</td>
<td>1.635178</td>
</tr>
</tbody>
</table>

1 The final demand total requirements table shows the total economic impacts in the local economy from a change in final demand sales by a given local economic sector.

2 T.C. & P.U. represents the Transportation, Communication and Public Utilities Sector.
### Table 16. Continued

<table>
<thead>
<tr>
<th>Sectors</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T.C. and Public Utilities*</td>
<td>Trade</td>
<td>Eating, Drinking and Lodging</td>
<td>Services</td>
<td>Local Government</td>
<td>Households</td>
</tr>
<tr>
<td>1. Livestock Production</td>
<td>0.000033</td>
<td>0.000035</td>
<td>0.000030</td>
<td>0.000043</td>
<td>0.000036</td>
<td>0.000073</td>
</tr>
<tr>
<td>2. Alfalfa Hay Production</td>
<td>0.000034</td>
<td>0.000036</td>
<td>0.000032</td>
<td>0.000045</td>
<td>0.000037</td>
<td>0.000077</td>
</tr>
<tr>
<td>3. Timothy Hay Production</td>
<td>0.000005</td>
<td>0.000006</td>
<td>0.000005</td>
<td>0.000007</td>
<td>0.000006</td>
<td>0.000012</td>
</tr>
<tr>
<td>4. Other Hay Production</td>
<td>0.000027</td>
<td>0.000029</td>
<td>0.000025</td>
<td>0.000035</td>
<td>0.000029</td>
<td>0.000061</td>
</tr>
<tr>
<td>5. Gold Mining</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>6. Other Mining</td>
<td>0.000317</td>
<td>0.000004</td>
<td>0.000004</td>
<td>0.000006</td>
<td>0.000009</td>
<td>0.000007</td>
</tr>
<tr>
<td>7. Construction</td>
<td>0.025947</td>
<td>0.006296</td>
<td>0.006309</td>
<td>0.021174</td>
<td>0.062063</td>
<td>0.003243</td>
</tr>
<tr>
<td>8. T.C. &amp; P.U.</td>
<td>1.005802</td>
<td>0.003312</td>
<td>0.002531</td>
<td>0.003031</td>
<td>0.002783</td>
<td>0.002581</td>
</tr>
<tr>
<td>9. Trade</td>
<td>0.002029</td>
<td>1.002111</td>
<td>0.004735</td>
<td>0.002634</td>
<td>0.003580</td>
<td>0.004427</td>
</tr>
<tr>
<td>10. Eating, Drinking and Lodging</td>
<td>0.001452</td>
<td>0.002255</td>
<td>1.001061</td>
<td>0.001878</td>
<td>0.001253</td>
<td>0.002576</td>
</tr>
<tr>
<td>11. Services</td>
<td>0.003035</td>
<td>0.004957</td>
<td>0.002509</td>
<td>1.005067</td>
<td>0.004118</td>
<td>0.006078</td>
</tr>
<tr>
<td>12. Local Government</td>
<td>0.005458</td>
<td>0.004461</td>
<td>0.004453</td>
<td>0.005755</td>
<td>1.055192</td>
<td>0.007084</td>
</tr>
<tr>
<td>13. Households</td>
<td>0.449169</td>
<td>0.479045</td>
<td>0.415680</td>
<td>0.590590</td>
<td>0.491442</td>
<td>1.012288</td>
</tr>
<tr>
<td>Column Totals</td>
<td>1.493308</td>
<td>1.502548</td>
<td>1.437373</td>
<td>1.630265</td>
<td>1.620549</td>
<td>1.038506</td>
</tr>
</tbody>
</table>

1. The final demand total requirements table shows the total economic impacts in the local economy from a change in final demand sales by a given local economic sector.
Final Demand, Employment and Household Income Multipliers

The total of interindustry (direct, indirect and induced) effects per one dollar change in sales to final demand for all 17 sectors in Eureka County are shown in Table 17 (column 1). These are called final demand multipliers. The final demand multiplier for the Livestock Sector (Sector 1) is 1.9051. The multiplier indicates that if sales by the Livestock Sector to final demand increase by one dollar, total Eureka County economy would increase by $1.9051. Using the final demand coefficient matrix in Table 16, the individual sectoral impacts can be derived from changes in sales to final demand. Final demand multipliers values range from 1.0252 for the Gold Mining Sector to 1.9051 for the Livestock Sector. The large multiplier for the Livestock Sector is indicative of this sector’s economic linkages with other sectors in the Eureka County economy. As for sectors with lower multipliers, these results may indicate local economic development initiatives to strengthen economic linkages of these sectors with others in the local economy.
Table 17. Final Demand, Employment, and Income Multipliers for Eureka County, 1990.

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Final Demand Multiplier</th>
<th>Employment Multipliers</th>
<th>Income Multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock</td>
<td>1.9051</td>
<td>1.5415</td>
<td>1.5761</td>
</tr>
<tr>
<td>Alfalfa Hay</td>
<td>1.5588</td>
<td>1.1872</td>
<td>1.1796</td>
</tr>
<tr>
<td>Timothy Hay</td>
<td>1.2993</td>
<td>1.2378</td>
<td>1.2356</td>
</tr>
<tr>
<td>Other Hay</td>
<td>1.3531</td>
<td>1.0292</td>
<td>1.0298</td>
</tr>
<tr>
<td>Gold Mining</td>
<td>1.0252</td>
<td>1.5803</td>
<td>1.3297</td>
</tr>
<tr>
<td>Other Mining</td>
<td>1.0814</td>
<td>3.9226</td>
<td>3.9939</td>
</tr>
<tr>
<td>Construction</td>
<td>1.6352</td>
<td>1.1538</td>
<td>1.1333</td>
</tr>
<tr>
<td>Transportation, Communication</td>
<td>1.4933</td>
<td>1.0425</td>
<td>1.0458</td>
</tr>
<tr>
<td>and Public Utilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>1.5025</td>
<td>1.0153</td>
<td>1.0233</td>
</tr>
<tr>
<td>Eating, Drinking, &amp; Lodging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>1.4374</td>
<td>1.0160</td>
<td>1.0245</td>
</tr>
<tr>
<td>Local Government</td>
<td>1.6205</td>
<td>1.1279</td>
<td>1.1319</td>
</tr>
</tbody>
</table>

Table 17 also shows employment and household income multipliers. Employment multipliers indicate the number of jobs increased in Eureka County when a given sector increases employment by one employee. Therefore, for the Livestock Sector, the employment multiplier is 1.5415. This means that when the Livestock Sector increases employment by one employee, total employment in Eureka County increases by 1.5415 employees. Employment multipliers range from 1.0153 for the Trade Sector to 3.9226 for the Other Mining Sector.

Income multipliers indicate the amount that household income in Eureka County increases when a given sector increases income by $1. For example, household income in Eureka County will increase by $1.5761 when the Livestock Sector increases household income by $1.00. Household income multipliers range from 1.0233 for the Trade Sector to 3.9939 for the Other Mining Sector.
Impact Analysis

What will be the economic impact of a proposed project or development? What will be the total regional impact on income and employment resulting from the establishment of a new plant? What type of industry, if established, will create the most economic activity? These are questions which are difficult to answer, but leaders in business and government require such information for purposes of evaluating how various projects and program will affect the economic activity in a region.

Community leaders are asking for information on the different abilities of various industries to generate new jobs. Decision makers need to know how the available resources in a region can best be used for further development and economic growth.

There are similar types of questions constantly facing Nevada businessmen and government leaders. Before expanding their facilities, businessmen attempt to evaluate the demand for increased production of goods and services. Others in the region are interested in the impact that new or expanded industries will have on businesses. Those who finance a new plant in an area want to know the impact the new facility will have on the economic activity of the state.

Information is also needed to measure declines in economic activity as well as increases. For example, what will be the effect on the economy if a plant or department of defense base closes its doors? What will be the total regional impact on income and employment resulting from lower levels of production activities by the agricultural or mining sector from changes in public land management policies? Employment and income would directly decline by the size of the employed labor force or payroll or payroll of the closed plant or affected industry. Other businesses in the region however would also feel the effects as lesser amounts of their goods and services would be demanded. Impact analysis can be used to estimate the regional impacts of increased or decreased economic activity in a regional economy. (Key items to be considered when a county anticipates economic change are shown in Appendix C).

Impact analysis is a technique which uses the economic linkages between and among local economic sectors for household income, employment and industry output. This technique
requires an input-output model of the local economic sectors to be developed showing the relationship between inputs and output of various sectors. The model numerically calculates the linkages between various economic sectors. The model solution shows impacts on local economic activity, employment, and income from a given sector’s change in sales or level of production. From these impact estimates, the community gains an understanding of potential overall impacts to a local economy from alternative economic development and governmental policies.

A Eureka County input-output model was developed with fifteen economic sectors. The model is used to estimate the economic linkages within Eureka County and to derive impacts to the Eureka County economy from various policies. Input-output multipliers that calculate sectoral linkages are also derived from the model solution.

**Impact Analysis Example**

The following example illustrates how impact analysis is used for estimating economic impacts. For illustrative purposes, assume that export sales for the Gold Mining Sector and the Alfalfa Hay Sector in Eureka County increased by 10%. Assume that these increased levels of export are the result of local economic development efforts. Economic impacts are estimated for economic activity, employment, and household income using the input-output model. These impacts are discussed with regard to total impacts, sectoral impacts, and distributational impacts.

Suppose that exports from the Alfalfa Hay Sector and the Gold Mining Sector increased by ten percent (10%) above their 1990 levels. This would mean that export sales would increase by $550,500 for the Alfalfa Hay Sector and $70,942,800 for the Gold Mining Sector. Table 18 shows the estimated total impacts on economic activity, employment and income that would occur in Eureka County.
Table 18. Total Impacts from a Ten Percent Increase in Export Sales by the Alfalfa Hay and Gold Mining Sectors in Eureka County.

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Economic Activity Impact ($1,000)</th>
<th>Employment Impact (Jobs)</th>
<th>Income Impact ($1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa Hay Sector</td>
<td>858.15</td>
<td>10.68</td>
<td>219.17</td>
</tr>
<tr>
<td>Gold Mining Sector</td>
<td>72,731.20</td>
<td>28.11</td>
<td>1,118.69</td>
</tr>
<tr>
<td>TOTAL</td>
<td>73,589.35</td>
<td>38.79</td>
<td>1,337.86</td>
</tr>
</tbody>
</table>

Eureka County is estimated to realize an increase in economic activity of approximately $0.9 million with corresponding increase in employment and income of 11 jobs and $0.2 million, respectively, from a ten percent increase in export sales by the Alfalfa Hay Sector. Likewise the county is estimated to realize a ten percent increase in export sales by the Gold Mining Sector from an increase in economic activity of approximately $72.7 million with corresponding increases in employment and income of 28 jobs and $1.1 million respectively. Eureka County is estimated to realized an increase in total economic activity of approximately $73.6 million, 39 jobs and $1.3 million in income from a ten percent increase in export sales by both the Alfalfa Hay Sector and the Gold Mining Sector.

**Alfalfa Hay Impacts**

Input-output models not only estimate overall impacts to a regional economy from changes in economic activity for a specific economic sector, but also derive sectoral impacts. These sectoral impacts provide information as to linkages between basic economic sector and non-basic sectors in a local economy. Table 19 presents the sectoral impacts of a ten percent increase in export sales by the Alfalfa Hay Sector in Eureka County. Again, the estimated ten percent increase in export sales by the Alfalfa Hay Sector was estimated to be approximately $0.5 million. This direct increase created approximately an additional $0.3 million in economic activity through indirect and induced effects resulting in over $0.9 million of total economic activity in Eureka County. Included in the total economic activity was approximately $0.2 million in income and 11 jobs.
Table 19. Sectoral Impacts from a Ten Percent Increase in Export Sales by the Alfalfa Hay Sector, Eureka County.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Direct Impact ($1,000)</th>
<th>Indirect and Induced Impact ($1,000)</th>
<th>Total Impact ($1,000)</th>
<th>Employment Impact (Jobs)</th>
<th>Income Impact ($1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock</td>
<td>0.0</td>
<td>0.02</td>
<td>0.02</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Alfalfa Hay</td>
<td>550.50</td>
<td>61.18</td>
<td>611.68</td>
<td>9.99</td>
<td>206.44</td>
</tr>
<tr>
<td>Timothy Hay</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Other Hay</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Gold Mining</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Other Mining</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Construction</td>
<td>0.00</td>
<td>1.33</td>
<td>1.33</td>
<td>0.02</td>
<td>0.59</td>
</tr>
<tr>
<td>Transportation, Communication and Public Utilities</td>
<td>0.00</td>
<td>11.04</td>
<td>11.04</td>
<td>0.21</td>
<td>4.74</td>
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<tr>
<td>Trade</td>
<td>0.00</td>
<td>1.59</td>
<td>1.59</td>
<td>0.06</td>
<td>0.74</td>
</tr>
<tr>
<td>Eating, Drinking, and Lodging Services</td>
<td>0.00</td>
<td>0.56</td>
<td>0.56</td>
<td>0.02</td>
<td>0.23</td>
</tr>
<tr>
<td>Local Government</td>
<td>0.00</td>
<td>6.36</td>
<td>6.36</td>
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</tr>
<tr>
<td>Households</td>
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<td>219.17</td>
<td>219.17</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>550.50</strong></td>
<td><strong>307.65</strong></td>
<td><strong>858.15</strong></td>
<td><strong>10.68</strong></td>
<td><strong>219.17</strong></td>
</tr>
</tbody>
</table>

Alfalfa Hay Sector Distributional Impacts

Table 20 summarizes the distribution of total economic impacts from the Alfalfa Hay Sector across major sectors in the Eureka County economy. As expected, the Alfalfa Hay Sector represents a significant portion of total economic activity, income, and employment associated with the ten percent increase in export sales by the Alfalfa Hay Sector. From Table 20, the Alfalfa Hay Sector represents approximately 71.28% of total economic activity created by the Alfalfa Hay Sector’s ten percent increase in export sales. Income and employment from the Alfalfa Hay Sector contributed approximately 94.19% and 93.53% respectively.

Other sectors in the Eureka County economy will be impacted when the Alfalfa Hay Sector expands output to meet expanding export demand. For example, the Transportation, Communication and Public Utilities Sector has 1.29% of total economic activity created by expanding export sales by the Alfalfa Hay Sector while income and employment from the
Transportation, Communication and Public Utilities Sector account for 2.16% and 1.99%, respectively of total activity.

Table 20. Distributional Impacts from a Ten Percent Increase in Export Sales by the Gold Mining Sector, Eureka County.

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Economic Activity Impact (%)</th>
<th>Employment Impact (%)</th>
<th>Income Impact (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa Hay</td>
<td>71.28</td>
<td>93.53</td>
<td>94.19</td>
</tr>
<tr>
<td>Construction</td>
<td>0.16</td>
<td>0.17</td>
<td>0.27</td>
</tr>
<tr>
<td>Transportation, Communication and Public Utilities</td>
<td>1.29</td>
<td>1.99</td>
<td>2.16</td>
</tr>
<tr>
<td>Local Government</td>
<td>0.74</td>
<td>1.06</td>
<td>1.26</td>
</tr>
<tr>
<td>Households</td>
<td>25.54</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Other Sectors</td>
<td>0.99</td>
<td>3.25</td>
<td>2.12</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Gold Mining Impacts

Table 21 present the sectoral economic impacts of a ten percent increase in export sales by the Gold Mining Sector in Eureka County. The estimated ten percent increase in export sales by the Gold Mining Sector was estimated to be a little over $70.9 million. This $70.9 million created approximately an additional $1.8 million in economic activity through indirect and induced effects resulting in $72.7 million of total economic activity in Eureka County. Included in total economic activity was approximately $1.1 million of personal income and 28 jobs.
Table 21. Sectoral Impacts from a Ten Percent Increase in Export Sales by the Gold Mining Sector, Eureka County.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Direct Impact ($1,000)</th>
<th>Indirect and Induced Impact ($1,000)</th>
<th>Total Impact ($1,000)</th>
<th>Employment Impact (Jobs)</th>
<th>Income Impact ($1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock</td>
<td>0.00</td>
<td>0.07</td>
<td>0.07</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Alfalfa Hay</td>
<td>0.00</td>
<td>0.07</td>
<td>0.07</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Timothy Hay</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Other Hay</td>
<td>0.00</td>
<td>0.07</td>
<td>0.07</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Gold Mining</td>
<td>70,942.80</td>
<td>0.00</td>
<td>70,942.80</td>
<td>17.66</td>
<td>841.31</td>
</tr>
<tr>
<td>Other Mining</td>
<td>0.00</td>
<td>40.15</td>
<td>40.15</td>
<td>0.01</td>
<td>0.26</td>
</tr>
<tr>
<td>Construction</td>
<td>0.00</td>
<td>279.59</td>
<td>279.59</td>
<td>3.85</td>
<td>124.08</td>
</tr>
<tr>
<td>Transportation &amp; Communication</td>
<td>0.00</td>
<td>3.62</td>
<td>3.62</td>
<td>0.07</td>
<td>1.55</td>
</tr>
<tr>
<td>and Public Utilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>0.00</td>
<td>6.03</td>
<td>6.03</td>
<td>0.23</td>
<td>2.82</td>
</tr>
<tr>
<td>Eating, Drinking, and Lodging</td>
<td>0.00</td>
<td>2.84</td>
<td>2.84</td>
<td>0.10</td>
<td>1.15</td>
</tr>
<tr>
<td>Services</td>
<td>0.00</td>
<td>7.38</td>
<td>7.38</td>
<td>0.30</td>
<td>4.22</td>
</tr>
<tr>
<td>Local Government</td>
<td>0.00</td>
<td>329.88</td>
<td>329.88</td>
<td>5.88</td>
<td>143.22</td>
</tr>
<tr>
<td>Households</td>
<td>0.00</td>
<td>1,118.70</td>
<td>1,118.70</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>70,942.80</strong></td>
<td><strong>1,788.40</strong></td>
<td><strong>72,731.20</strong></td>
<td><strong>28.11</strong></td>
<td><strong>1,118.69</strong></td>
</tr>
</tbody>
</table>
Gold Mining Distributional Impacts

Table 22 summarizes the distribution of total economic impacts from the increase in export sales by the Gold Mining Sector across major sectors in the Eureka County economy. As expected, the Gold Mining Sector represents a significant portion of total economic activity, income, and employment associated with the ten percent increase in the Gold Mining Sector’s export sales. The Gold Mining Sector represents approximately 97.54% of total economic activity generated by its ten percent increase in export sales. Income and employment from the Gold Mining Sector contributed approximately 75.20% and 62.84%, respectively.

Table 22. Distributional Impacts from a Ten Percent Increase in Export Sales by the Gold Mining Sector, Eureka County.

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Economic Activity Impact (%)</th>
<th>Employment Impact (%)</th>
<th>Income Impact (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Mining</td>
<td>97.54</td>
<td>62.84</td>
<td>75.20</td>
</tr>
<tr>
<td>Construction</td>
<td>0.38</td>
<td>13.69</td>
<td>11.09</td>
</tr>
<tr>
<td>Local Government</td>
<td>0.45</td>
<td>20.92</td>
<td>12.80</td>
</tr>
<tr>
<td>Households</td>
<td>1.54</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Other Sectors</td>
<td>0.09</td>
<td>2.55</td>
<td>0.91</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

However, in order for the Service Sector to meet expanding export demand, this sector is dependent upon other economic sectors in the Eureka County economy. For example, the Construction Sector has over 0.38% of the total economic activity created by expanding export sales by the Gold Mining Sector while income and employment from the Gold Mining Sector account for 11.09% and 13.69% respectively, of total activity.

Table 22 indicates that the Gold Mining Sector provides substantial amounts of relatively good paying jobs. A little over 75% of total income is created through the Gold Mining Sector export sales which go directly to employees in the Gold Mining Sector that provide only 62.84% of total jobs. Even though additional employment impacts are created through supporting sectors in the county economy, this employment is compensated at lower salaries and wages than the Gold Mining Sector.
Summary

During the 1980’s and early 1990’s, Eureka County has experienced rapid economic growth with some instability. The rapid growth of the local Gold Mining Sector has been the primary impetus for economic growth. However, most of these gold mining operations are located in northern Eureka County with substantial numbers of workers living in Elko County. Therefore, the economic impacts of expanded household consumption are lost somewhat to Elko County. Lately gold prices have decreased where the consequence is reduced income to the gold mining industry and potential decreases in gold mining production.

To help local decision makers understand economic linkages in the local economy and provide analysis regarding alternative economic diversification strategies, an input-output model for Eureka County was developed. This model shows the economic linkages among county economic sectors and can be used to estimate regional activity, employment and income impacts to Eureka County from alternative changes in the local economy.

Final demand, employment, and income multipliers are estimated for each sector in Eureka County. The individual sectoral multipliers are presented in this report. Both public and private sector decision makers can readily use these multipliers to estimate economic impacts of changes in final demand sales or changes in production caused by changes in product market export sales, natural resource supplies, or government policy. The model can also be expanded to estimate potential impacts of a new economic sector locating in Eureka County.
References


APPENDIX A:
LISTING OF ECONOMIC SECTORS
Table A.1. Sectors and Sector Definitions for the Humboldt County Interindustry Model.

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>TYPE OF ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Livestock</td>
<td>Ranches engaged in production and sale of cattle, horses, sheep or other livestock</td>
</tr>
<tr>
<td>2. Alfalfa Hay</td>
<td>Farm enterprises that mainly produce alfalfa hay.</td>
</tr>
<tr>
<td>3. Timothy Hay</td>
<td>Farm enterprises that mainly produce timothy hay.</td>
</tr>
<tr>
<td>4. Other Hay</td>
<td>Farm enterprises that mainly produce other types of hay.</td>
</tr>
<tr>
<td>5. Gold Mining</td>
<td>The extraction and processing of gold minerals.</td>
</tr>
<tr>
<td>6. Other Mining</td>
<td>The extraction and processing of metal and non-metal minerals not classified under gold mining.</td>
</tr>
<tr>
<td>7. Construction</td>
<td>Businesses engaged in any type of heavy or general building construction including new construction, addictions, alterations, and repairs.</td>
</tr>
<tr>
<td>8. Transportation,</td>
<td>Businesses furnishing local or long distance trucking, the associated warehousing services, and air and road transportation firms serving the area. Also businesses furnishing telephone, radio, and television services. In addition, gas and electric power companies.</td>
</tr>
<tr>
<td>Communication and Public Utilities</td>
<td></td>
</tr>
<tr>
<td>9. Trade</td>
<td>All wholesale and retail businesses not elsewhere classified.</td>
</tr>
<tr>
<td>10. Eating, Drinking, and</td>
<td>Restaurants, bars, motels, and hotels.</td>
</tr>
<tr>
<td>Lodging</td>
<td></td>
</tr>
<tr>
<td>11. Services</td>
<td>Repair services, social services, professional services, and other services not elsewhere classified.</td>
</tr>
<tr>
<td>12. Local Government</td>
<td>City and county government including special districts.</td>
</tr>
<tr>
<td>13. Household (row)</td>
<td>Labor payments, transfer payments, interests and dividends.</td>
</tr>
<tr>
<td>Household (column)</td>
<td>Expenditures by individuals and families for personal (non-business) uses.</td>
</tr>
<tr>
<td>14. Import (row)</td>
<td>All purchases of goods and services from outside Humboldt County.</td>
</tr>
<tr>
<td>Export (column)</td>
<td>Goods and services provided to places outside the Humboldt County.</td>
</tr>
<tr>
<td>15. Other Final Payments</td>
<td>State and federal taxes, depreciation, retained earnings and savings.</td>
</tr>
<tr>
<td>(row)</td>
<td></td>
</tr>
<tr>
<td>Other Final Demand (column)</td>
<td>State and federal government consumption, inventory change, and new capital investments.</td>
</tr>
</tbody>
</table>
APPENDIX B:
SOURCES OF DATA FOR EUREKA COUNTY
INPUT-OUTPUT MODEL
Sources


APPENDIX C:
PRIVATE SECTOR, LOCAL GOVERNMENT, AND NON-MARKET IMPACTS FROM ECONOMIC CHANGES
Table C.1. Impacts of Economic Change on the Private Sector - Important Consideration

1. How many workers will be hired by the new business activity? What is the dollar value of the anticipated payroll? What will be the value of production or sales from the new business activity?

2. What is the "multiplier" effect and how can it be appraised in a community?

3. When will the new workers be hired? When will the payroll be generated? And when will the new purchases and sales be made in the local economy?

4. Is the new economy activity associated with construction or operation of the business?

5. Will the new economic activity stimulate construction in related businesses, housing, and service and trade sectors of the economy?

6. Do the changes in employment, income, and sales represent net or gross additions to the community's economic base?

7. How does the new economic activity compliment the local economic situation?

8. What will be the incidence of the impacts? More specifically which people and businesses are likely to benefit, and which people and businesses are likely to bear the costs of the economic development.

Table C. 2. Impacts of Economic Change on the Local Government Sector-Important Considerations.

1. Within what governmental jurisdictions will new families live?

2. How many in-migrant families are expected, and what is their anticipated income level?

3. How many school-age children are expected?

4. Do the public services and schools have excess capacity, or would expansions be required to maintain the quality of service at predevelopment levels?

5. Are there migration fees to cover additional public service costs?

6. Will state and federal aid increase as population grows?

7. When will the project be completed?

8. Does the expenditure estimation procedure used include only the additional costs associated with the new growth?

9. Will new revenues be divided among more than one governmental unit, such as city, county, and school district? If so, how much additional revenue will each receive?

10. When will the public Expenditures for the project begin and when will the community begin receiving project-generated revenues? How will these change over time?

11. Will projected demands for service require a change in tax rates or a change in the level of service?

12. Who benefits and who loses from the development?

13. Will tax abatements or other publicly supported inducements be used to encourage this growth?

14. Is the project capital-or labor-intensive?

15. What is the probability that the firm will remain in the area and operate successfully over a five, 10, or 20 year period?

16. What are the income and employment multiplier effects of the new industry?

17. How will this development and associated population growth affect state aid to education and local property tax revenues in your state?

Table C.3. Nonmarket Impacts of Economic Change-Important Considerations

I. Distribution: Who Will Be Affected?
   A. Will effects vary among geographic sectors of the community?
   B. What income groups will be affected and in what ways?
   C. Will all or just certain economic sectors of the community have to make adjustments?
   D. Will the impacts vary over time?

II. Employment-Related Impacts.
   A. Will the new jobs be satisfying to workers?
   B. Effects on commuting time and distance. How far must local residents travel to their new jobs?
   C. Will the jobs be permanent or will they be highly sensitive to managerial decision and economic trends?
   D. Will the workers perceive the new jobs as an improvement over previous conditions?

III. Population-Related Impacts.
   A. Demographic.
      1. How much in-migration will occur?
      2. Will the newcomers and their families match or be different from the prevalent age and family structure of the community?
      3. What value changes might occur?
      4. Can the newcomers easily be integrated into the community social structure or will adjustments be needed?
   B. Housing.
      1. How will the value of housing change?
      2. How will the quality of housing change?
      3. What changes in housing ownership will occur?
      4. What type of new housing will be needed?

IV. Community Ecology.
   A. How will communication networks be affected?
   B. How will religious organizations be affected?
   C. How will participation in community affairs be affected
   D. What different internal-external linkages will appear?
   E. Will satisfaction with the community change?

V. Political and Local Government.
   A. Political
      1. What leadership changes will occur?
      2. Will voter participation change?
   B. How will public recreation facilities and use be altered?
   C. Will physical safety of workers and residents change?
   D. What short-and long-term health effect could occur?