



Economic Development Report



Department of Agricultural and Resource Economics, Fort Collins, CO 80523-1172

March 2007-EDR 07-02

The Community Economics of Community Forestry: A Partial Analysis of Public Lands Partnership, Delta and Montrose Counties, Colorado

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Introduction

Community Based Forestry (CBF) implies commitment to the long term ecological, economic and social well being of forest dependent communities. CBF, or community scale sustainable forestry, constitutes a departure from industrial forestry due to this commitment to the preservation of the ecological integrity of the forest ecosystem in perpetuity and to the maintenance or improvement in the quality of life in the host or gateway community in addition to seeking profits from forest products sales.

CBF and CFOs present a substantial analytical challenge. CBF organizations may assume a great variety of potential roles in a community. These roles may have direct, indirect and/or induced economic impacts on a community. We employ commonly used regional economic development techniques to highlight the local economic impact of CFO programs by tracing the recent activities of Public Lands Partnership (PLP), a CFO located in SW Colorado, through its local economy. This approach is at variance with the more common application of the same regional economic tools, as it turns the analysis upside down. Typically, regional economic approaches take a snap shot of an entire economy and then attempt to discern the impact of an individual industry or sector on the entire economy, or from the top down. Here, we begin with CBF programs and derive the impact on the economy from the programs upward. This is only possible due to close collaboration with the CFO as to the inputs, outputs, intended and unintended outcomes of their programs.

Public Lands Partnership has become involved in several projects to promote sustainable management of public lands as well as provide environmental education for the public.

The economic impact of PLP reached between \$150 and \$200 thousand each of the past 5 years.

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The Economies of Delta and Montrose Counties, Colorado

Delta and Montrose Counties occupies over two million acres on the Western Slope of Colorado. The area has a total population of 61,266, with 27,834 residents living in Delta County and 33,432 residents living in Montrose County. The population of the area is growing more slowly than the state of Colorado, but is exceeding the growth rate of the United States. Similar to other rural counties, 80% of the area's population holds a high school degree while 13% have earned a college degree or higher. While Delta is commonly considered a farming and ranching community, 11% of the population is employed in the manufacturing sector in Montrose County.

Unlike many rural areas, the employment and income profile of Delta and Montrose Counties illustrates that the local economy is relatively diverse, with the Educational, Health, and Social Services sector, employing the greatest share (18%) of the workforce followed by Retail Trade, and Construction. The Agricultural, Forestry, Fishing, Hunting and Mining sector is the fourth largest employer in the area (10%, 2,443 jobs) (US Bureau of Labor, 2006).

Delta and Montrose Counties experience high employment seasonality. This is consistent with the profile of a typical agricultural community. Historically, this region suffers from both high employment seasonality as well as high unemployment relative to the state of Colorado and the nation as a whole.

According to the U.S. Bureau of Economic Analysis data, a significant portion of the population was living under the poverty line. Of the residents 18 years and younger, 15% lived below the poverty line in Delta County and 18% in Montrose County (EPSc, 2003). Average household income is increasing and rose by 31.7% in Delta County and 16.0% in Montrose County from 1989 to 1999 (EPS, 2003). In 1999, average household income in Delta County was \$32,785 and \$35,234 in Montrose County as compared to the national average of \$31,472 (EPS, 2003).

An input-output model of an economy facilitates understanding of the linkages and interdependencies among local economic sectors. A look at an aggregation of the Delta and Montrose Counties economy will help us to later understand the role of Public Lands Partnership within the regional economy. IMPLAN, a popular input-output based software tool for economic analysis, is used for this part of our analysis.

IMPLAN uses 509 industrial sectors which are based on the North American Industry Classification System (NAICS). These industries can then be aggregated using varying levels of either the NAICS categories or their predecessors, the Standard Industrial Classification (SIC) codes. County level data aggregations and two-digit NAICS codes have been used for this analysis, due to the significant potential for disclosure problems in a relatively undiversified rural economy, as well as for the likely principal level of interest in the activities of Public Lands Partnership. For each industry, IMPLAN calculates the total output, employment, total value added and other economic impacts. This allows for a general overview of the economic environment of a region.

Table 1 provides an overview of the aggregated economy of Delta and Montrose Counties as generated using IMPLAN. For the area, total direct industry output is over \$1,328 million dollars, based on 2002 data. The Government sector is the largest sector, generating over 15% of the total direct industry output, in 2002. The Agriculture, Forestry, Fishing and Hunting sectors generate the second highest industry output, over \$331 million dollars (about 14% of the total economy), 3,770 jobs and almost \$33 million in employee wages and salaries.

IMPLAN also calculates multipliers, or the distribution of economic impact through an economy due to a dollar of sales outside of the economy or the introduction of a dollar of new money to the economy in the form of output, income and employment. Direct economic effects have to do with economic activity directly associated with the production and sales of goods and services. So, the machinery, labor, and fuel required to cut down trees and to make them into pulp, poles, or boards are economic activities directly associated with the production of wood products. Direct economic impacts are multiplied through the economy by means of indirect and induced effects. Indirect effects are local economic activities stimulated by the production of the direct economic activities. So, locally purchased accounting, legal, and transportation services, associated with the sales of wood products are indirect effects of wood production. Induced effects are the economic purchases unassociated with

the good produced, but that are generated due to individuals' association with the production process. So, sawyers are paid for their work. They use their salaries to purchase homes and automobiles, to go to the grocery store, and to local restaurants. If the sawyers spend their money locally, there is an induced economic effect of their spending. Money spent on nonlocal goods and services is called leakage.

Table 1. Total Output Summary for Delta and Montrose Counties, Colorado, 2002 (IMPLAN)

Industry	Industry Output*	Employment	Employee Compensation*	Proprietor Income*	Other Property Income*	Indirect Business Tax*	Total Value Added*
Ag, Forestry, Fish & Hunting	331.672	3,770	32.976	12.287	48.764	9.19	103.216
Mining	76.739	403	16.867	9.345	14.272	4.736	45.22
Utilities	68.75	254	14.83	0.651	23.633	7.453	46.567
Construction	293.391	2,593	62.656	52.163	11.142	1.506	127.469
Manufacturing	319.03	2,009	58.228	2.428	35.534	2.202	98.391
Wholesale Trade	59.503	694	21.45	1.994	9.533	10.103	43.08
Transportation & Warehousing	53.501	703	18.761	-1.774	2.703	1.738	21.428
Retail trade	196.035	3,804	76.929	11.899	29.447	28.887	147.162
Information	44.077	321	9.084	2.746	7.419	1.793	21.042
Finance & insurance	84.29	690	22.866	2.198	25.072	1.417	51.552
Real estate & rental	92.774	826	9.704	8.567	31.472	7.722	57.464
Professional-scientific & tech services	63.783	935	27.402	13.657	4.748	0.797	46.603
Management of companies	6.952	33	3.412	0.015	1.484	0.079	4.991
Administrative & waste services	33.348	814	14.386	2.552	2.777	0.634	20.35
Educational service	1.149	27	0.432	0.105	0.093	0.021	0.651
Health & social services	134.756	2,700	57.567	13.087	10.27	1.099	82.022
Arts- entertainment & recreation	10.974	197	4.449	0.838	0.376	0.521	6.184
Accommodation & food services	74.112	2,032	22.811	2.063	4.279	2.816	31.969
Other services	88.19	1,580	34.944	10.874	1.09	1.409	48.318
Government & non NAICS	367.493	4,157	193.334	0	115.232	16.621	325.187
Totals	2,400.51 9	28,542	703.088	145.693	379.340	100.745	1328.86 6

*Millions of dollars

This project focuses on the effects of community based forestry on local economies. To better understand these effects, a focused view of the forestry and logging sectors is provided. In 2002, the Logging sector employed 131 residents and generated a total output of \$18.817 million. Proprietors earned \$1.668 million from this sector. The Agriculture and Forestry Support Activities sector generated 579 jobs and a total output of \$11.612 million, in 2002 (Table 2). It is interesting to note that the Forest Nurseries, Forest Products and Timber sectors do not report any information. This is due to the small number (three or fewer) of operations within these industries, locally, which causes confidentiality and disclosure issues.

Table 2. Total Output Summary for Forestry and Related Sectors in Delta and Montrose Counties, Colorado (IMPLAN) 2002

Industry	Industry Output*	Employment	Employee Compensation*	Proprietor Income*	Other Property Income*	Indirect Business Tax*	Total Value Added*
Logging	18.817	131	0.517	1.668	1.731	0.111	4.028
Forest nurseries, forest products, timber	0	0	0	0	0	0	0
Ag. and forestry support activities	11.612	579	5.529	3.492	-1.99	0.118	7.149

*millions of dollars

Tables 3 and 4 show total output and total employment impacts after adjusting for the multiplier effects. After adjusting for the Type II multiplier of 1.63 in the Logging sector and 1.64 in the Agriculture and Forestry Support sector, the total output impact is \$49.749 million. After the two sectors are adjusted for additional employment impacts, the total employment impact is 949 jobs.

Table 3. Output Multipliers and Total Adjusted Output for Delta and Montrose Counties (IMPLAN)

Industry	Direct Effects	Indirect Effects	Induced Effects	Total	Type II Multiplier	Total Output Impact (\$ millions)
Logging	1	0.517	0.113	1.631	1.631	30.682
Ag and forestry support activities	1	0.226	0.416	1.642	1.642	19.067

Table 4. Employment Multipliers and Total Adjusted Employment for Delta and Montrose Counties (IMPLAN)

Industry	Direct Effects	Indirect Effects	Induced Effects	Total	Type II Multiplier	Total Employment Impact
Logging	6.961	5.993	1.496	14.450	2.076	272
Ag and forestry support activities	49.896	2.935	5.490	58.321	1.169	677

Public Lands Partnership

Public Lands Partnership is a non-profit organization which began in 1992 on the Western Slope of Colorado. The organization began as loose group of residents, businesses, government agencies, and land management agencies and has since evolved into an active facilitator among local groups as well as a driving force for environmental education. PLP prides itself on bringing people together and getting them to agree toward positive action when they would not otherwise do so. The organization is funded through grants from the Ford Foundation as well as Colorado's Department of Wildlife. With the aid of these grants, PLP is able to work with the local government to promote the ecologically and economically sustainable management of public lands on the Western Slope.

Public Lands Partnership has become involved in several projects to promote sustainable management of public lands as well as provide environmental education for the public. PLP is an active participant in several restoration projects, including the Uncompahgre Plateau Project where local agencies are working together to restore the wildlife habitat of this area. This will provide benefits to both wildlife and the local people. A second restoration project is the Rancher Habitat Program where local ranchers are encouraged to transition to more sustainable means of production. PLP also works towards educating the community through video documentary of the local history as well as a Logger Demonstration project to promote local forestry. Given the nature of these projects, it is again difficult to fully capture the economic impacts of PLP, but again input/output modeling will be used to provide an estimate.

A project by project break out of funds was not available for Public Lands Partnership, so instead yearly expenditures were used. PLP received the Ford Foundation grant in 2000 and expenditures are tracked through 2005. The various expenditures of PLP have been classified using the North American Industry Classification System (NAICS). This is then entered into IMPLAN which allows for the impact to be traced throughout the community.

IMPLAN accepts industrial classifications at the three digit NAICS code scale so the classifications used are quite broad. Tables 5 and 6 show the output impacts and employment impacts of PLP expenditures for the fiscal year 2000-2001. The top twenty industries are reported for each year. After the first year of funding from the Ford Foundation (2000-2001), PLP expenditures totaled \$102,837. After accounting for indirect and induced effects, PLP had a total output impact of \$145,274, or less than 1/10 of a percent of the total regional economy. This figure may seem deceptively small. Stated differently, for every dollar PLP added to the economy, an additional 41 cents of economic activity was generated in Delta and Montrose counties. Given the nature of the organization's activities it is sensible that PLP would have a large impact on the Administrative Support sector, but the organization also had a significant impact on the Domestic Trade as well as the Professional, Scientific, and Technical Services sectors. Table 6 illustrates that 1.1 jobs were directly generated by PLP expenditures while an additional 0.6 jobs were created due to indirect and induced effects for the fiscal year.

Table 5. Output Impact of PLP Expenditures (2001-2002)

Sector Number	Industry Sector	Direct	Indirect	Induced	Total
452	561 Admin support service	52,577	6,202	5,954	64,733
437	541 Professional- scientific & tech service	11,021	4,778	5,913	21,712
28001	Domestic Trade	17,591	0	0	17,591
11001	Federal Government NonDefense	11,473	0	0	11,473
461	611 Educational service	4,030	2,099	4,750	10,879
495	92 Government & non NAICS	1,426	1,987	2,066	5,478
429	525 Funds- trusts & other finance	4,438	200	41	4,679
487	812 Personal & laundry service	2,146	18	2,145	4,309
46	311 Food products	1,007	1,414	1,472	3,892
491	813 Religious- grantmaking- & similar	1,318	23	1,375	2,715
12001	State/Local Govt NonEducation	2,419	0	0	2,419
469	624 Social assistance	17	1,554	438	2,009
451	551 Management of companies	894	93	929	1,916
460	562 Waste mgmt & remediation service	0	1,693	172	1,865
432	532 Rental & leasing service	351	709	568	1,628
513	U.S. Postal Service	857	345	146	1,347
25001	Foreign Trade	1,136	0	0	1,136
482	811 Repair & maintenance	199	509	368	1,077
405	445 food & beverage stores	1,033	18	1	1,052
471	711 Performing arts & spectator sports	51	722	273	1,046
Total		118,027	24,689	29,615	172,331

After the second fiscal year (2001-2002), PLP spent \$118,027 in the local economy which then generated an additional \$54,304 within the counties. The total output impact was \$172,331 or less than 1/10 of a percent of the total regional economy. For every one dollar spent in the local economy by PLP, an additional 46 cents are generated in the economy. As in the previous year, PLP had the greatest impact on the Administrative Support sector and the Professional, Scientific, and Technical Services sectors. In the 2001-2002 fiscal year, PLP directly generated 1.4 jobs while the organization had a total employment impact of 2.2 jobs.

After the third fiscal year (2002-2003), PLP expenditures totaled \$132,201 with a total output impact of \$187,579, which, although certainly not inconsequential, again accounted for less than 1/10 of a percent of the regional economy. PLP had the greatest impact on the Administrative Support Services and Professional, Scientific, and Technical Services sectors. From 2002-2003, every dollar spent by PLP generated an additional 42 cents. PLP had a total employment impact of 2.1 jobs. The organization directly generated 1.3 jobs and indirectly created 0.7 jobs, that same year.

In the fourth fiscal year (2003-2004), PLP expenditures decreased significantly from \$132,201 the previous year to \$112,171. As opposed to the previous years, the money spent by PLP had the greatest effect on the Professional, Scientific, and Technical Services sector. On a per dollar basis, this did not have an effect on the total output impacts for the year. Although PLP accounted for less than 1/10 of a percent of the total regional economy, for every dollar spent by PLP in the economy, an additional 42 cents were generated. The result was similar for total employment impacts. In 2004, 1 job was directly created while an additional 0.7 jobs were created by indirect and induced effects.

In the final year of the analysis (2004-2005), PLP spent a total of \$124,647 in the local economy. This money generated an additional 40 cents for every dollar spent within the economy for a total output impact of \$174,198, accounting for less than 1/10 of a percent of the regional economy. Again, the Professional, Scientific, and Technical Services sector shows the greatest impact from the expenditures. In 2005, PLP directly generated 1.1 jobs within the local economy and had a total employment impact of 1.8 jobs.

Concluding remarks

Although input/output modeling provides a quantitative analysis of the economic impacts of programs, it does not completely capture the value of an organization. It is difficult to capture the total economic impact of Public Lands Partnership on the local economies of Delta and Montrose Counties. Each year, PLP output impacts accounted for less than 1/10 of a percent of the total economy. However, the yearly impact of the organization reached between \$150 and \$200 thousand each year, a significant injection in any economy. This fact highlights the efficacy of this approach over more typical regional analyses. By working from the project upward we can identify \$175 thousand dollars worth of economic activity attributable to the organization annually. Had we viewed the economy from the top down and searched for the influence of the organization in the overall economy, we probably would not have found it. Moreover, PLP works with local residents and agencies to better manage public lands on the Western Slope of Colorado. This will have impacts that extend beyond the scope of the input/output model. The value of the working relationships formed and the educational aspects of projects carried out by PLP cannot be fully captured by this type of approach, yet are nonetheless invaluable to the region.

The intended outcomes of Community Based Forestry may be largely agreed upon by communities who choose to pursue this alternative for economic development. However, the chosen means to the commonly envisaged end vary substantially. Analytically, CBF is not simply an alternative means of producing the same forest products produced by industrial forestry. Rather, it is a distinctly different collection of ways to manage forest lands. These distinct approaches to land management imply different values and objectives of the managers. We hope that this approach will help communities facing similar choices to make better informed decisions appropriate to their needs and aspirations.

Acknowledgements

This work was made possible by a generous grant from the Ford Foundation. It would not have been possible without the substantial time, effort and expertise that the Ford research team, its advisory committee, and the 13 implementing partners contributed to this portion of the overall research effort. We are particularly indebted to Tony and Maria at CSU for their patience and guidance in this effort and to Mary at the Public Lands Partnership for openly sharing their data and their experiences, and their substantial capacities, insights and expertise in helping us to better understand what they do and to couch it in economic terms. Their warmth and encouragement is most appreciated. All errors or omission or commission are unintentional and are the responsibility of the authors.

Resources

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