An Economic Impact Model of the Foothills Model Forest

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Dr. Janaki Alavalapati
Dr. William White
Adam Wellstead
Mike Patriquin

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foothills model forest
a growing understanding

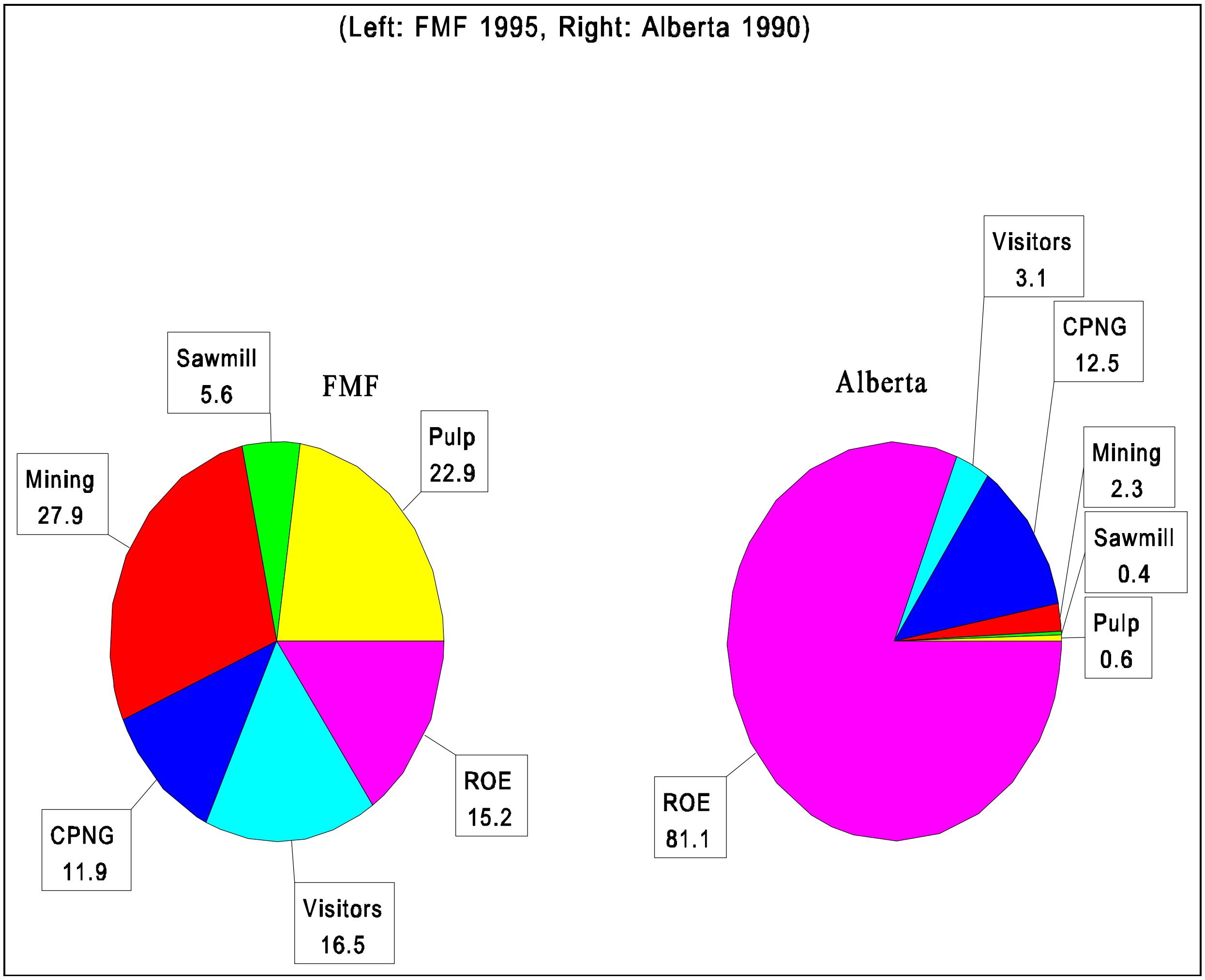
Foothills Model Forest is one of eleven Model Forests that make up the Canadian Model Forest Network. As such, Foothills Model Forest is a non-profit organization representing a wide array of industrial, academic, government and non-government partners, and is located in Hinton, Alberta. The three principal partners representing the agencies with vested management authority for the lands that comprise the Foothills Model Forest, include Weldwood of Canada (Hinton Division), the Alberta Department of Environmental Protection and Jasper National Park. These lands encompass a combined area of more than 2.75 million hectares under active resource management.

The Canadian Forest Service of Natural Resources Canada is also a principal partner in each of the eleven Model Forest organizations and provides the primary funding and administrative support to Canada=s Model Forest Program.

The Foothills Model Forest mission: AWe are a unique community of partners dedicated to providing practical solutions for stewardship and sustainability of our forest lands.@

Introduction

The objective of this report is to estimate the economic impacts on a regional economy encompassing the Foothills Model Forest (FMF) using a Social Accounting Matrix (SAM) model. In figure 1, we demonstrate the importance of the resource sectors in the FMF economy and in the province of Alberta.



The significantly different compositions of the provincial and FMF economies (Figure 1) highlights the need for a regional impact model and justifies the focus of our simulations on the resource sectors of the FMF economy. The first section of the report briefly outlines the available economic models that can be utilized for economic impact analysis. Then, a brief specification of the model and the data sources from the FMF are discussed in section two, accompanied by a detailed description and specification in Appendix A. Four hypothetical changes to the FMF economy (a contraction of the pulp sector, a reduction in coal production, an expansion of the crude petroleum and natural gas sector, and finally a contraction of the visitor sector) are simulated and the economic impacts are examined in the third section. The final section discusses the need for further research and the potential for future economic modeling.

Economic Impact Models

There are three primary approaches used to estimate economy-wide socioeconomic impacts of changes in an economy: the input-output (I-O) model, the Social Accounting Matrix (SAM) model, and the computable general equilibrium (CGE) model. In this section, each model is outlined and its function in analyzing economic impacts and policy issues is discussed.

Input/output models are the most common type of economic impact models. They are relatively simple, provide quick results and demonstrate the flow of intermediate goods between producing sectors in an economy (Adelman and Robinson, 1986). However, these models are constrained to showing only the links between the producing sectors in an economy. Other linkages in an economy such as flows from producing sectors to primary factors of production (e.g., land, labour and capital) and then to institutions (e.g., households) are not examined. However, input-output data provides an important base for other modeling techniques such as SAM and CGE. We have expanded upon input-output data to construct a SAM model for both the province of Alberta and the FMF, with the intent of eventually building CGE models.

SAM is a form of double-entry bookkeeping and provides a detailed account of the incomes and expenditures in a specified economy. The SAM framework can be used to model not only the economic impacts, similar to I-O models, but also the distributional impacts (who gains and who loses) of a newly proposed project (i.e. a new saw mill or the expansion of a coal project) or a tax (lumber export tax) upon an economy. Other impacts can include, increases (decreases) in the cost of production, exogenous increases (decreases) in taxes, and export duties. SAM models are based on similar assumptions to I-O models (i.e., fixed coefficients and no role for prices).[1] These assumptions limit the applicability of the SAM model in deriving economic impacts of policy changes. These models are demand driven and do not account for supply constraints or the possibility of substitution (Adelman and Robinson, 1986). If the supply of inputs is limited the technical coefficients would change and rising prices would cause a substitution effect. I-O and SAM models

[1]The underlying assumption of both I-O and SAM models is that technical coefficients or the ratio of input from one sector to output from another sector is fixed. This is known as constant returns to scale. For example, if output from one sector doubles then the inputs that sector purchases from other sectors must also double.

cannot handle these complexities, while CGE models can.

CGE models have been proposed as an alternative analytical tool for policy analysis. The CGE approach allows more flexibility and is thought to generate less biased estimates when compared to other modeling techniques. The CGE approach permits prices of inputs to vary with respect to changes in output prices and thus capture the behavior of economic agents. It incorporates a variety of flexible production functions which allow producers to substitute cheaper inputs for more expensive inputs. This model also can accommodate constraints on the availability of primary inputs and accounts for additional intersectoral linkages. For example, if factors of production are limited in supply, the expansion in some sectors will draw factors of production from other sectors thereby causing a contraction in those industries. Because of the assumptions implicit in I-O models, CGE models generate results that may be different from those of an I-O model. Furthermore, depending upon the nature of the economy under investigation, each of these assumptions can be modified to a desired level. For example, the substitution between inputs can vary from no substitution to perfect substitution.

Model Specification and Data Collection

For the purpose of analysis, the FMF's economy is divided into six sectors: pulp, sawmilling , mining and related services, crude petroleum and natural gas, visitor, and the rest of the economy (representing all other sectors in the economy such as agriculture, manufacturing, non-tourism related services).[2]

There is no limit as to the size of an economy that can be measured by SAM. SAM has been used for national, regional, and local level socioeconomic analysis. Moreover, there are no limits as to the level of detail of the data used in the model. The more detailed the data, the more accurate the assessment that can be made. The construction of a SAM on a regional level (i.e., sub-provincial scale) poses several difficulties but offers significant benefits. The challenge for developing an FMF SAM has been collecting accurate and timely data specific to the region. Unfortunately, most of the economic data collected by federal and provincial government statistical agencies are only available at the national and provincial level. Moreover, when disaggregated regional level data are available the combination of the three areas that comprise the FMF (Weldwood of Canada=s FMA, Jasper National Park, and Wilmore Wilderness Park) do not conform to federal or provincial census regions. Past studies often use provincial data and disaggregate it to a regional level or rely heavily on provincial averages. However, as illustrated above in Figure 1, a regional economy such as the FMF does not always mirror the provincial economy. The five major sectors identified in the FMF, the pulp sector, the sawmill sector, the mining sector, the crude petroleum and natural gas sector, and

[2] See Appendix A for the description of the SAM matrix and detailed specification of the model.

the visitor sector account for approximately 85% of the value of output from this regional economy. A comparison between the value of output by sector for the FMF and the province reveals that there are major differences (with the exception of the crude petroleum and natural gas sector). The same four sectors in the provincial economy account for less than 19% of the value of output from the province. For example, both agriculture and manufacturing are negligible activities in the FMF but are major provincial economic activities and account for a portion of the large difference between the comparative size of the rest of the economy sector. The application of provincial multipliers to a specific region within the province would be based on a faulty assumption and would lead to an incorrect interpretation of a region=s economy. As a result, regionally specific data for the FMF were collected for this project.

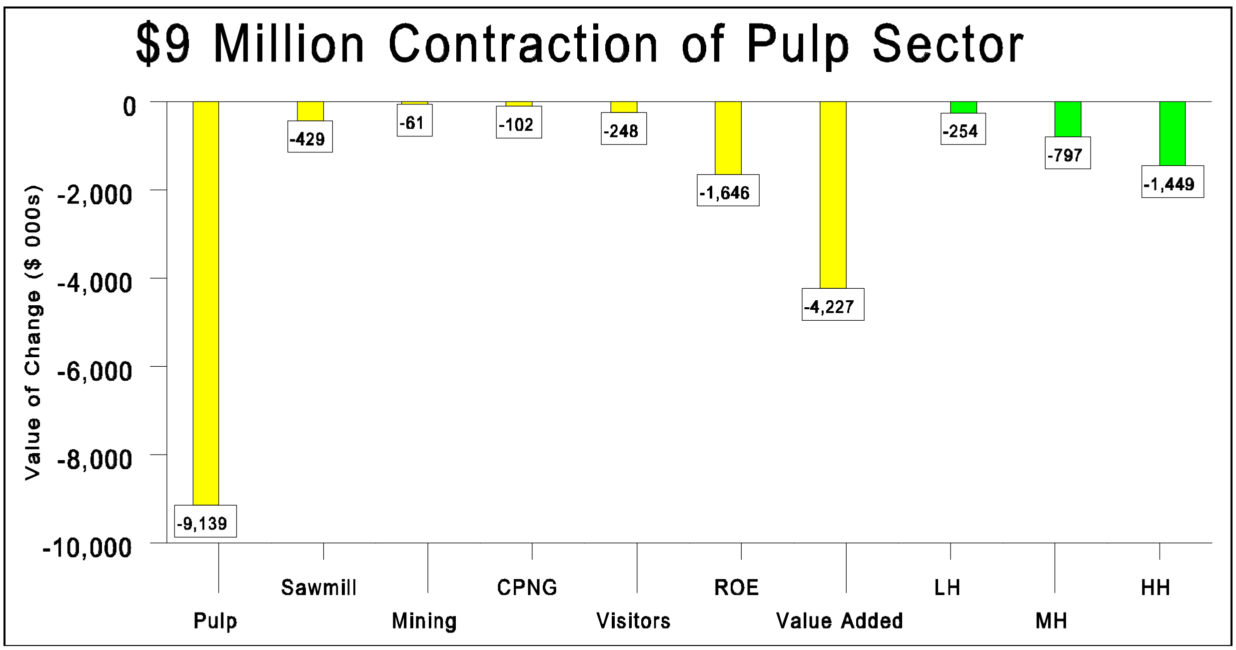
Our most important data sources were the individual firms that operate within the FMF. A company's financial records will reveal detailed information that is required to construct an accurate and precise aggregated summary of the transactions in an economy. For example, Weldwood of Canada Limited provided information pertaining to their pulp and sawmill operations in the FMF. For confidentiality reasons, other firms and individuals were unwilling to provide us with data. In some cases, such as the crude petroleum and natural gas sector, the number of companies made it infeasible to survey them. However, most of the data regarding production activities of the mining sector and the crude petroleum and natural gas sector in the FMF were provided by Alberta Energy. The results obtained at the time of this report are based on the local data collected to date and the further provision of detailed regional data from companies would improve the accuracy of the results. Visitor related data was derived from a visitor study conducted by the CFS Socioeconomic Research Group currently in progress. Information about household activity was obtained from a 1996 FMF household expenditure survey also conducted by the CFS Socioeconomic Research Group (Jagger, Wellstead, and White, 1998). Total household expenditures were split into three income groupings: low income (less than $30,000), medium income ($30,000 to $59,999), and high income ($60,000 or greater). Where detailed information could not be obtained locally some of the data in the FMF SAM has been filled in and adjusted using the provincial data as a proxy.

Simulations and Results

This section presents and discusses four economic impact simulations that would result from potential changes to the FMF economy. The trends in all of the shocks are similar. That is, when the direct shocks are negative, the spinoff effects on the remaining sectors will also be negative and conversely, when the direct shocks are positive the spinoff effects will be positive. The scale of the reduction or increase in output will depend on the size of the shock and how the sectors interact.[3]

[3] I-O and SAM models can not simulate tradeoffs between sectors while CGE can do so.

The first case examines a hypothetical $9 million contraction of the pulp sector. This potential shock is explained by a potential loss of timber supply resulting from the creation of Special Places 2000 protected areas within part of Weldwood's FMA. The net present value of the stream of benefits from the land base that is proposed for protected areas was obtained from Weldwood of Canada Ltd. and



then converted to an annual value of $9 million. The land base proposed for protection would produce an annual average value of timber worth $9 million if left as part of Weldwood's productive area. The results show that the pulp sector has an estimated demand side multiplier of 1.761. This means that a $9 million contraction to the pulp sector will result in an economy wide reduction of $15.85 million. In other words, every $1 reduction in the pulp sector will result in a $1.761 FMF economy-wide reduction. The results and the distribution of impacts of the simulation are summarized in Figure 2. The $9 million contraction of the pulp sector results in a total reduction of output in the pulp sector of $9.139 million. The spinoff effects account for the additional $0.139 million reduction in pulp sector output. This contraction also leads to contractions in all the other sectors in the FMF, including the value added components made up of the primary factors of production (i.e., labour, capital, and land).[4] The change to the pulp sector results in a corresponding

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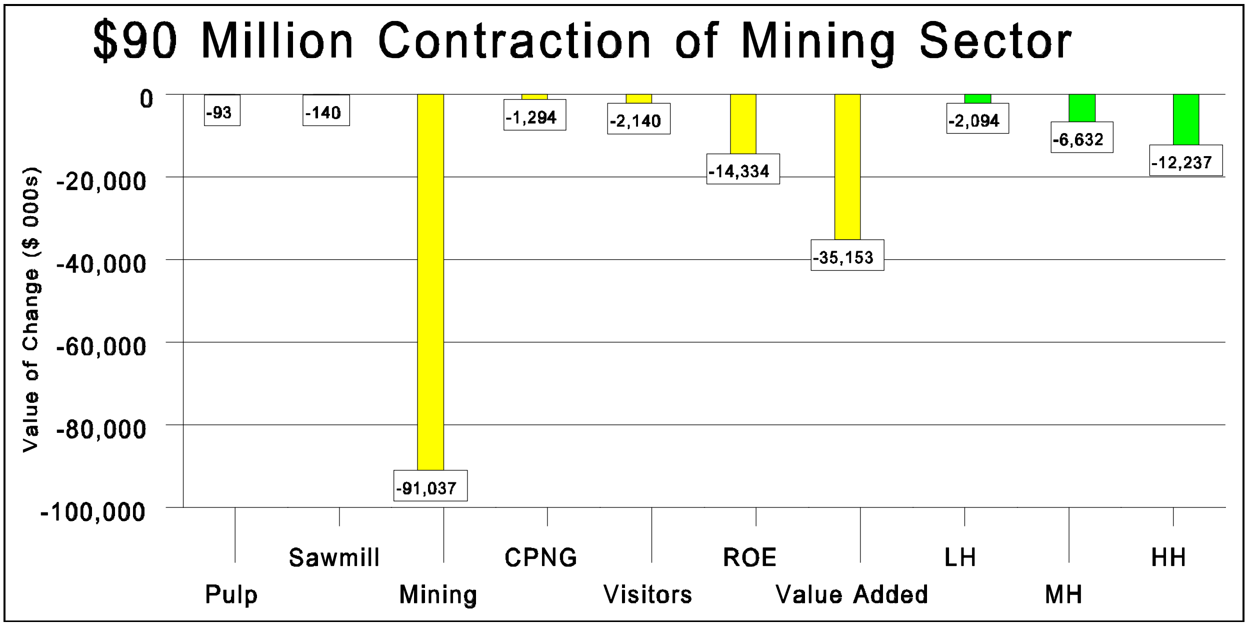
[4]The interaction between sectors, factors of production, households etc. means that even though the shock is directly affecting one sector, all sectors in the economy will have corresponding impacts due to the circular flow of linking transactions. For example, a decrease in the output of the pulp sector results in a decrease in inputs purchased from other sectors, thereby reducing the output of the other sectors and so on. Similarly, a decrease in the output of the pulp



decrease of $1.646 million in the rest of the economy sector and $4.227 million in value added.

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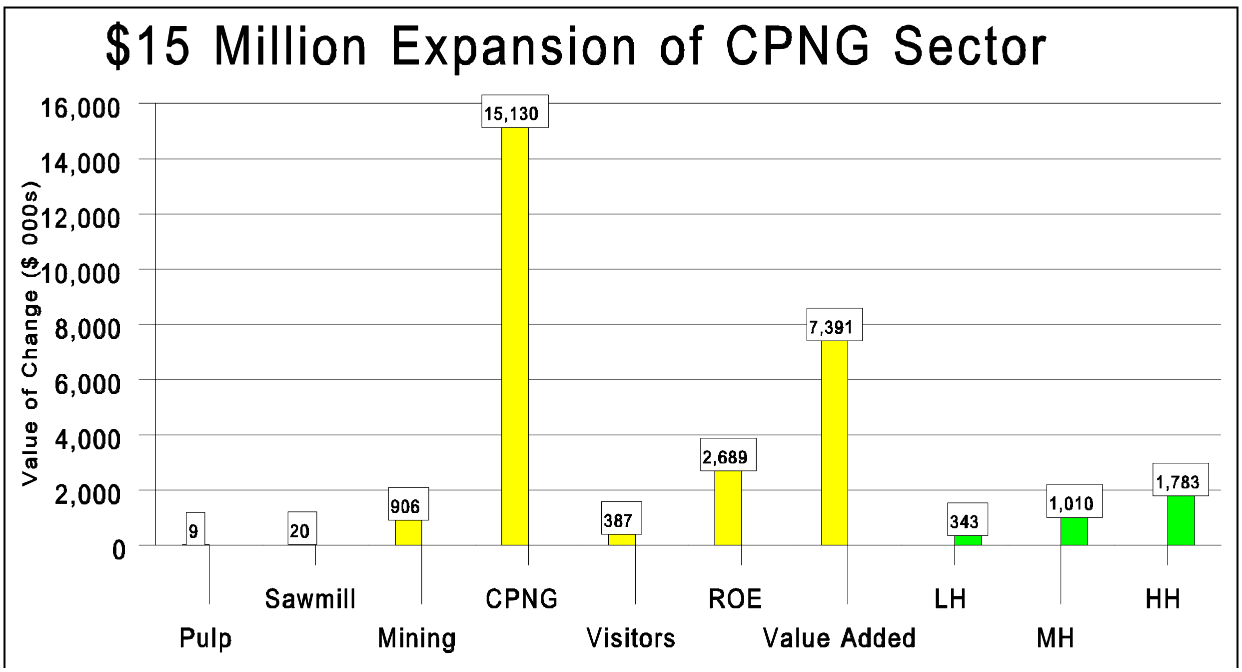
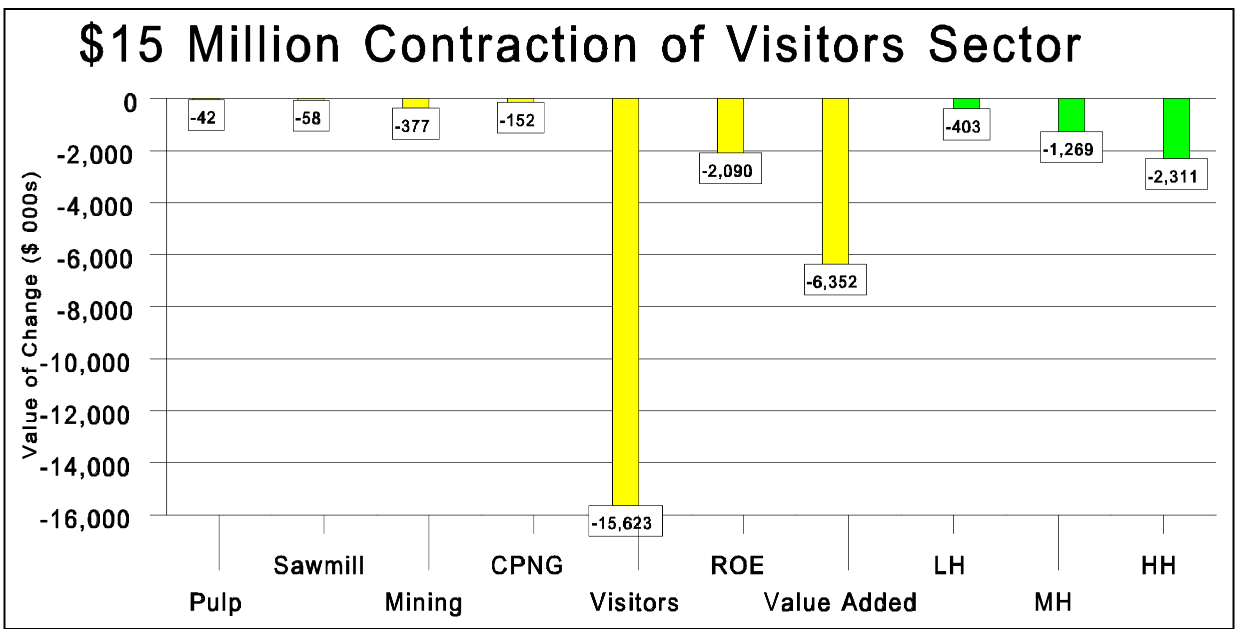
sector will decrease the labour income in the pulp sector, thereby reducing household income. A reduction in household income results in less consumer spending, thereby reducing the output of each sector and so on.

In Figure 3, we examine the economy wide impacts of a hypothetical $90 million contraction of the mining sector. This shock is explained by the potential phasing out of an existing coal mine. We do not know the exact value of production from an individual coal mine however, should a coal mine be phased out without replacement, the estimated annual value of lost output is at least $90 million. The mining sector demand side multiplier is estimated to be 1.602. Therefore, a $90 million contraction of the mining sector results in an economy wide total reduction of $144.19 million. The shock results in a total reduction of output in the mining sector of $91.037 million. In addition, all of the other sectors also experience negative impacts resulting from the contraction of the mining sector. For example, the rest of the economy sector experienced a $14.334 million reduction in output and there was a $35.153 million drop in value added. It is also interesting to note the distributional effects of this shock. If an existing coal mine is phased out low income households will lose $2.094 million, medium income households will lose $6.632 million, and high income households will lose $12.237 million.

In Figure 4, we examine the economy wide impacts of a hypothetical $15 million expansion of the crude petroleum and natural gas sector. This shock is the result of the potential increase in natural gas production due to the discovery of two new gas reservoirs. These two gas reservoirs have the potential to produce an annual average of 308 million cubic meters. At 1995 prices, this converts to



approximately $15 million. The crude petroleum and natural gas sector has an estimated demand side multiplier of 1.769. Therefore, a $15 million increase in the crude petroleum and natural gas sector results in an economy wide total increase of $26.53 million. This shock will result in a $15.130 million increase in the crude petroleum and natural gas sector. The increase in crude petroleum and natural gas sector will also cause increases throughout the rest of the economy. For example, the rest of the economy sector will increase by $2.689 million, value added will increase by $7.391 million. This results from higher linkages between the crude petroleum and natural gas sector and the rest of the economy. The crude petroleum and natural gas sector also has a relatively high linkage with the factors of production. A comparison of Figure 4 and Figure 5 reveals that for an identical $15 million shock, positive or negative, the impact on value added will be larger if the shock takes place in the crude petroleum and natural gas sector than in the visitor sector. This relationship also holds for impacts to the rest of the economy sector. However, the reverse relationship holds for impacts on household income. A $15 million shock in the visitor sector impacts household income to a greater extent than an identical $15 million shock in the crude petroleum and natural gas sector.



Finally in Figure 5, we examine the economy wide impacts of a hypothetical $15 million contraction of the visitor sector. This shock is the result of a potential 5% decrease in visitor expenditures due to decreased tourism or a potential decrease of work crews coming from outside the FMF. For example, it has been reported that visitor activity in the national parks has decreased as a result of the

Asian-Pacific economic crisis (Staton, 1998). In this simulation the visitor sector has an estimated demand side multiplier of 1.7913. Therefore, a $15 million decrease in the visitor sector results in an economy-wide decrease of $24.69 million. The $15 million shock in the visitor sector has a smaller economy-wide impact than the $15 million shock in the crude petroleum and natural gas sector.

In all four of the simulations a noteworthy trend is identified. The low income households benefit least from a positive shock and lose less from a negative shock. In comparison, high income households gain the most from a positive shock and lose the most from a negative shock. This is directly tied to the general flow from producing sectors to primary factors of production to households. Since low income households have the smallest linkage to the value added factors of production, the impacts from a policy change, either positive or negative, will be smaller. High income households have the largest linkage to the primary factors of production and therefore, impacts on the economy have the largest impact on their income, either positive or negative. This suggests that the strongest arguments for expansion in resource sector may come from high income households, who stand to gain the most or lose the most if the resource sectors expand or contract.

Future Research and Modeling Potential

The SAM model has allowed us to examine the economic impacts to the FMF economy at a greater level of detail and accuracy than simple input/output analysis, but several gaps still exist. The level of accuracy in the model can still be improved with additional cooperation in the collection of detailed regional data. Upon the completion of further data refinement, the next step or challenge in the modeling process is to develop a price responsive CGE model that will expand upon our existing model. This will allow us greater flexibility in the range of policies or impacts that can be modeled and the solution to the model will yield valuable information for both private and public decision-makers.

Our future research plan includes the development of SAM and CGE computerized decision support system (DSS). There is a potential to develop a Auser-friendly@ client based DSS that can be used in the offices of companies. There, managers could simulate their own specific economic impacts.

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APPENDIX A: Technical Compendium

Description of the SAM Matrix and Detailed Model Specification

Description of the SAM Matrix and Detailed Model Specification

SAM expands on input-output data and provides a compilation and comprehensive description of the incomes and expenditures of a defined economy. It is a square matrix framework and is a relatively simple yet efficient way of showing that for every income there is a corresponding expenditure (Pyatt, 1988). This implies that the column and row totals must be equal. Thus the matrix is no more than a form of double entry bookkeeping. The SAM for the FMF is outlined in Table 2 at the end of the Appendix. This section describes each of the cells and how they correspond to the FMF economy. The totals for the columns, the outgoings (expenditures), exactly equals the rows, the incomings (receipts).

The model measures three basic elements in all economies: consumption, production, and income. The economy is divided into five components: sectors, factors of production, institutions, investment, and interaction with the rest of the world. The producing sectors (industries), located on the top left hand corner of the matrix, are defined as a group of operating units or firms engaged in the same of similar kinds of economic activity (Alberta Treasury, 1974). There are six major sectors identified in the FMF economy: the pulp sector, the sawmill sector, mining and related services sector, crude petroleum and natural gas sector, the tourism sector, and the rest of the FMF economy (i.e., a composite sector comprised of manufacturing, non-tourism services, etc.). For example, the FMF pulp sector bought $22,874,000 worth of goods and services from the rest of the FMF economy. And conversely, the rest of the FMF economy sold $22,874,000 to the FMF pulp sector. Moving right, along the columns and down the row, the next component of the matrix are the primary factors of production: labour, capital and land. Further along the matrix are institutions: businesses, households, and governments.

The households are disaggregated into three categories according to level of income: low (<$30,000), medium ($30,000-59,999), and high (>$60,000). Therefore, medium income households received $85,884,000 for their labour outputs. It is interesting to note that low income households received a total household income of $55,847,000. Of the total, $25,579,000 was for their labour outputs and $22,550,000 was from government transfer payments (i.e., approximately 40% of low income household's total household income is derived from transfer payments). The next major component is capital formation. The Alberta Treasury (1974), defines capital formation as private or government expenditures on new machinery and equipment and new construction. The final component is the rest of the world (ROW). For the purpose of this model, ROW is defined as the rest of the world outside the border that defines the FMF. Not surprisingly, because the FMF's economy is export oriented, the ROW is the largest component of the SAM.

In this study, we examine economy-wide socioeconomic impacts of these proposed changes in resource sectors in the Foothills region of Alberta. Partial equilibrium models cannot account for changes in other sectors of the economy in response to changes in resource sectors. In other words, partial equilibrium models are not capable to capture intersectoral linkages. In this study , we use SAM, a multisectoral approach, to capture direct, indirect and cross effects of proposed changes.

Many researchers have applied SAM models to analyze regional resource issues (Marcouiller, et al. 1995 and 1997). However, they have focused only on changes in outputs and factor and household incomes in response to changes in resource activities. In this study, we apply a SAM model to examine changes in outputs and factor and household incomes but also to analyze price formation and cost transmission mechanisms in response to a set of changes in resource sectors.[5]

[5]Roland-Holst and Sancho (1995) are the first to use SAM-based models to examine price formation and its implications for household welfare.

Following Roland-Holst and Sancho (1995), we present a schematic diagram of a SAM in Table 1.[6] Similar to input-output (I-O) models, SAM models account for intersectoral flows of intermediate inputs. However, SAM models go further to incorporate flows from producing sectors to factors of production and then on to government and households, and finally back to demand for goods (Adelman and Robinson 1986).[7] Exogenous changes in the economy which stimulate the level of activity in producing sectors may also induce changes in factor incomes. Factor incomes that accrue to households may induce new final demand for producer goods and services. Thus a SAM details the direct linkages among its producing sectors and institutions and underlying indirect interactions. Table 1 has four types of accounts, namely, production, factors, households, and an aggregated remaining sectors (government, capital and foreign accounts). In the SAM, the columns and rows, respectively, indicate the payments and receipts of economic agents.

Table 1. A schematic social accounting matrix

	I	II	III	IV	V
I. Production	T_{11}	0	T_{13}	T_{14}	Y_1
II. Factors	T_{21}	0	0	T_{24}	Y_2
III. Households	0	T_{32}	T_{33}	T_{34}	Y_3
IV. Other sectors	T_{41}	T_{42}	T_{43}	T_{44}	Y_4

[6]The following discussion is drawn from Roland-Holst and Sancho (1995).

[7]See Pyatt and Round (1985) for a detailed discussion of SAM.

V. Total	Y_1	Y_2	Y_3	Y_4

Reading the entries in Table 1 down the columns shows that producing sectors pay for raw materials (T_{11}) and primary factors (T_{21}) which are combined to generate output; factors make use of households’ endowments (T_{32}) to provide producing sectors with primary factors; households pay producing sectors (T_{13}) for their consumption goods and services; and each group pays taxes to the consolidated group. Thus each of the groups has a price index and is linked to other price indicies through coefficient submatrices of the SAM. On the other hand entries across the rows reflect firms’ receipts from raw material sales (T_{11}) and households’ consumption sales(T_{13}); factors’ receipts from firms for their use in production (T_{21}); and households’ receipts from factors for the use of their services (T_{32}).

The first step in developing a SAM model involves the separation of endogenous and exogenous sectors. Furthermore, an assumption that activity levels may vary while prices are fixed in the economy should be made. In Table 1, we consider that group I is endogenous and II, III, and IV are exogenous. Let A_{ij} be the matrix of normalized column coefficients obtained from T_{ij} and let ì$_i$ be the incomes of exogenous groups (i = 2,3,4). Then

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the income level of group I can be expressed as

where $M_{11} = (I - A_{11})^{-1}$ is the familiar Leontief inverse matrix and x is a vector of exogenous sectors. Column i of M_{11} reflects changes in endogenous variables induced by unitary changes in exogenous sector i.

Roland-Holst and Sancho (1995) consider the polar case in which prices are responsive to costs but not to activity levels. They assume that prices are homogeneous degree one in prices of inputs and producing sectors exhibit

Leontief production technology. The implication of this assumption is that prices can be computed independently of activity levels. Let P_i be a price index for group i=s activity. Following the same classification of endogenous and

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exogenous accounts as noted earlier we have

where v_i be a row vector of exogenous costs such as factor payments and taxes/tariffs. Row j of M_{11} shows the effects on prices in response to unitary exogenous changes in sector j costs.

Equation (1) and (2) do not account for indirect effects associated with changes in factor incomes and corresponding changes in the final demand for producer goods and services. Linking these accounts is straight forward when producers, factors, and households are considered as endogenous and other sectors are exogenous.

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Let

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and let A be a matrix of normalized coefficients:

Let Y = (Y_1, Y_2, Y_3) be the vector of endogenous income groups. In matrix notation we can derive changes in Y from the expression

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where M = is the income multiplier matrix. For the same classification of endogenous and exogenous accounts, M

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is also a price-transmission matrix:

It should be noted that the interpretation of M is different depending on whether we read its entries across the rows or down the columns. Following Roland-Holst and Sancho (1995), we clarify this distinction by referring to M as the income multiplier matrix whereas its transpose, M:, as the price-transition matrix.

Decomposition of the multiplier matrix, M, is another interesting feature of SAM analysis. M can be decomposed into multiplicative components each of which relates to a particular type of connection in the system as a whole (Stone 1985:156). In the above example, there are three endogenous sub-systems and a shock applied to one sub-system may have the following effects: 1) it will move around within the subsystem, generating impacts of the type measured by the Leontief inverse; 2) it may move around the entire system and return to the subsystem from which it started; and 3) it may move around and end up in one of the other sub-systems (Stone 1985:156). These are generally referred to as direct effects, indirect effects, and cross effects; or intragroup, intergroup, and

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extragoup effects. Let

Following Stone (1985), we decompose the multiplier matrix as follows:

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The multiplier effects included in M_1 arise as a result of the initial impact within the group of sub-systems and thus measure direct impacts. The multiplier effects included in M_2 arise in response to the initial injection when it has completed a tour through all three groups and returned to the one that it had originally entered and thus captures intergroup or indirect impacts. Finally, the multiplier effects included in M_3 arise due to the initial shock when it has completed a tour outside its original group without returning to it. The corresponding price-formation expression

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is

The procedures described above are applied to estimate impacts of proposed changes described in section three of the report. In doing so, we developed a 6 sector, three factor, four institution, and three other sector SAM for the Foothills region of Alberta (see Table 2). In the absence of regional input-output data and other economic accounts, we have followed various means in building SAM fore the Foothills region. They include collecting of data on sectoral activities in the region, mapping provincial data to regional level; eliciting information from opinion leaders of the region; and using judgement. This suggests that there is a lot scope to improve the quality of data in the future. Efforts are being made by the members of Socioeconomic Group at the Canadian Forest Service to refine regional economic data.

Table 2

1995 FMF SAM ($000s)																	
	s1	**s2**	**s3**	**s4**	**s5**	**s6**	**L**	**K**	**D**	**B**	**H1**	**H2**	**H3**	**G**	**KF**	**ROW**	***Total***
s1	5926	34	247	0	581	536	0	0	0	0	44	62	71	59	18	398696	*406274*	**s1**
s2	17935	2740	99	2	584	560	0	0	0	0	234	398	647	412	198	74638	*98447*	**s2**
s3	166	17	2816	11398	5085	6773	0	0	0	0	29	49	56	1	414	467253	*494056*	**s3**
s4	3523	524	6077	1254	2034	1778	0	0	0	0	187	269	307	1	2014	193151	*211119*	**s4**
s5	0	0	0	0	4982	29150	0	0	0	0	1341	2144	3056	481	11133	206864	*259151*	**s5**
s6	22874	6287	27084	16364	6556	33857	0	0	0	0	29316	38883	56113	11624	8665	-14088	*243534*	**s6**
L	91022	14383	98276	24865	59346	55769	0	0	0	0	2109	3201	3436	54035	0	-69439	*337004*	**L**
K	50475	5395	40526	42178	28372	31955	0	0	0	0	276	420	451	8457	0	3596	*212100*	**K**
D	6874	0	13878	15544	0	0	0	0	0	0	0	0	0	0	0	0	*36296*	**D**
B	0	0	0	0	0	0	0	88891	0	0	139	212	227	38657	0	0	*128126*	**B**
H1	0	0	0	0	0	0	25579	7814	0	454	0	0	0	22550	0	-550	*55847*	**H1**
H2	0	0	0	0	0	0	85884	18634	0	222	0	0	0	14421	0	-3588	*115573*	**H2**
H3	0	0	0	0	0	0	164309	23750	1592	105	0	0	0	3698	0	-15164	*178290*	**H3**
G	4000	607	5343	7481	3798	3320	0	24005	34705	18880	7203	34281	57705	728	2117	-24167	*180004*	**G**
KF	0	0	0	0	0	0	0	0	0	68935	-610	4014	13869	8508	0	-10010	*84705*	**KF**
ROW	203479	68461	299710	92033	147815	79836	61233	49006	0	39530	15580	31640	42354	16373	60145	0	*1207193*	**ROW**
Total	*406274*	*98447*	*494056*	*211119*	*259151*	*243534*	*337004*	*212100*	*36296*	*128126*	*55847*	*115573*	*178290*	*180004*	*84705*	*1207193*		

LEGEND

Sectors		Institutions	
S1	Pulp Sector	B	Business
S2	Sawmill Sector	H1	Hholds low income (<$30,000)
S3	Mining & Related Services Sector	H2	Hholds med income ($30,000-$59,999)
S4	Crude Petroleum & Natural Gas Sector	H3	Hholds high income (>$59,999)
S5	Tourism Sector	G	Government
S6	Rest of the FMF Economy	Investment	
Factors of Production		KF	Capital Formation
L	Labour	Interaction Outside the FMF	
K	Capital	ROW	Rest of the World
D	Land	Totals	

Please note: Equations cannot be accessed in this report due to the conversion to a PDF file.