The Economic Impact of British Columbia's Forest Sector

March 2021

BC COUNCIL OF FOREST INDUSTRIES

About the Study

The study was conducted by the BC Council of Forest Industries (COFI), which represents most lumber, pulp and paper, and manufactured wood producers from across the province. The lead author was Kurt Niquidet, Chief Economist at COFI. Kurt holds a Ph.D. in Resource Economics from the University of Groningen and is an Adjunct Professor in the Faculty of Forestry at the University of British Columbia.

The majority of the data that forms the basis of the study was sourced from Statistics Canada. The study measured the economic impact of the B.C. forest industry's ongoing operations, employment and capital spending related to forestry and logging, wood product manufacturing, and pulp and paper manufacturing across the province.

To ensure the robustness of the study, an independent firm, PricewaterhouseCoopers (PwC), was engaged to review the methodology and calculations conducted for the purpose of this study. The conclusions from their review are summarized below.

PricewaterhouseCoopers conducted a review of the methodology used by COFI to undertake the Economic Impact Study and reviewed the study results. Based on our review, we have concluded that the methodology is consistent with common practices and the calculations are accurate.

PricewaterhouseCoopers LLP

Report Summary

The forest sector in British Columbia (B.C.) is a foundational industry that supports economic activity in all regions of the province. To quantify the total contribution of the forest sector to the provincial economy, an economic impact analysis was undertaken using Statistics Canada's Interprovincial Input-Output model. The key findings of the analysis indicate that in 2019, forest sector operations generated the following levels of economic activity:

- Over 100,000 jobs spread throughout the province, with almost half of the jobs located in the Lower Mainland and Southwest Region.
- $13.3 billion in GDP with $4.8 billion derived from forestry, logging and support activities, $5.5 billion from wood products manufacturing, and $3 billion from pulp and paper manufacturing.
- Approximately $8.4 billion in labour income, which includes wages and salaries as well as employers' social contributions such as contributions to pension plans.
- $4.1 billion in government revenue with $2.3 billion going to the provincial government, $1.5 billion to the federal government and $247 million to municipal governments.

In addition, between 2010 and 2019, approximately $14 billion was invested in B.C. by the forest sector in capital expenditures, repair and maintenance.
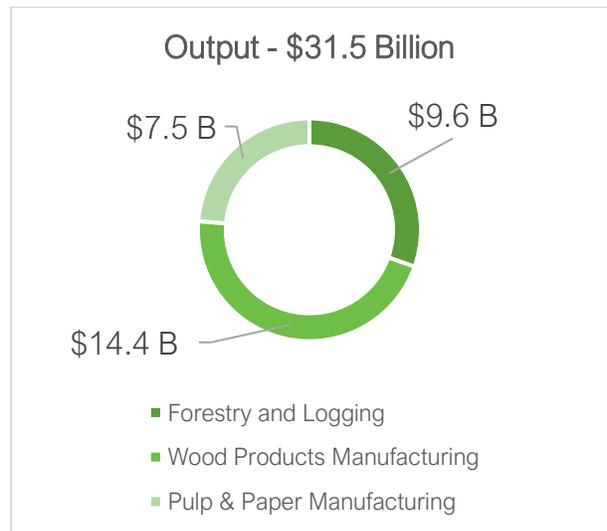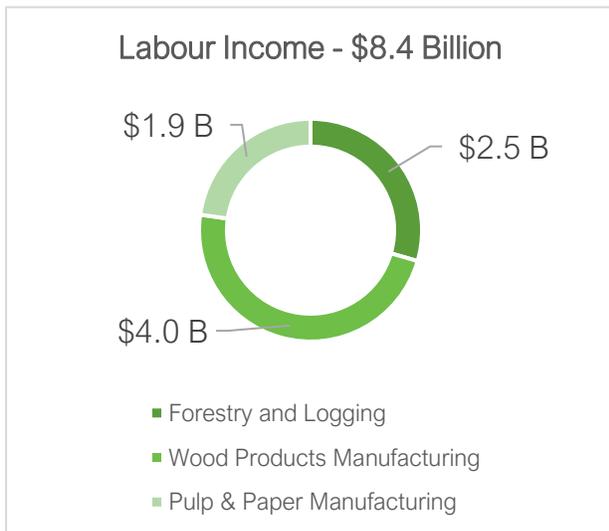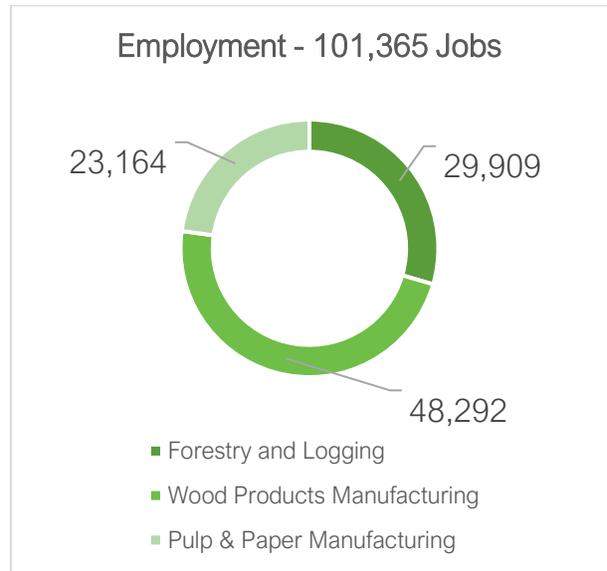
GDP - $13.3 Billion

$3.0 B

$4.8 B

$5.5 B

- Forestry and Logging
- Wood Products Manufacturing
- Pulp & Paper Manufacturing

Employment - 101,365 Jobs

23,164

29,909

48,292

- Forestry and Logging
- Wood Products Manufacturing
- Pulp & Paper Manufacturing

Labour Income - $8.4 Billion

$1.9 B

$2.5 B

$4.0 B

- Forestry and Logging
- Wood Products Manufacturing
- Pulp & Paper Manufacturing

Output - $31.5 Billion

$7.5 B

$9.6 B

$14.4 B

- Forestry and Logging
- Wood Products Manufacturing
- Pulp & Paper Manufacturing

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INTRODUCTION

The forest industry in British Columbia (B.C.) is foundational to the provincial economy. For over a century, the forest sector has been critical to regional economic development in the province and a source of economic benefits for British Columbians. While the provincial economy is constantly evolving and has become more diversified over time, the role of the forest sector in the economy remains very important. For instance, in 2020, forest products were B.C.'s number one export category, representing 28.8% of all exports by value (**Chart 1**). Further, global demand for forest products is projected to be strong in the years ahead owing to growth in both traditional and emerging forest products markets. Combining this with the fact that sustainable production of forest products, along with products' carbon-storing cabilities, have a crucial role to play in mitigating climate change, suggests that the forest sector has a bright future and will continue to provide opportunities for British Columbians for generations to come.

Chart 1 - Forest Products are B.C.'s Leading Export

Source: BC Stats
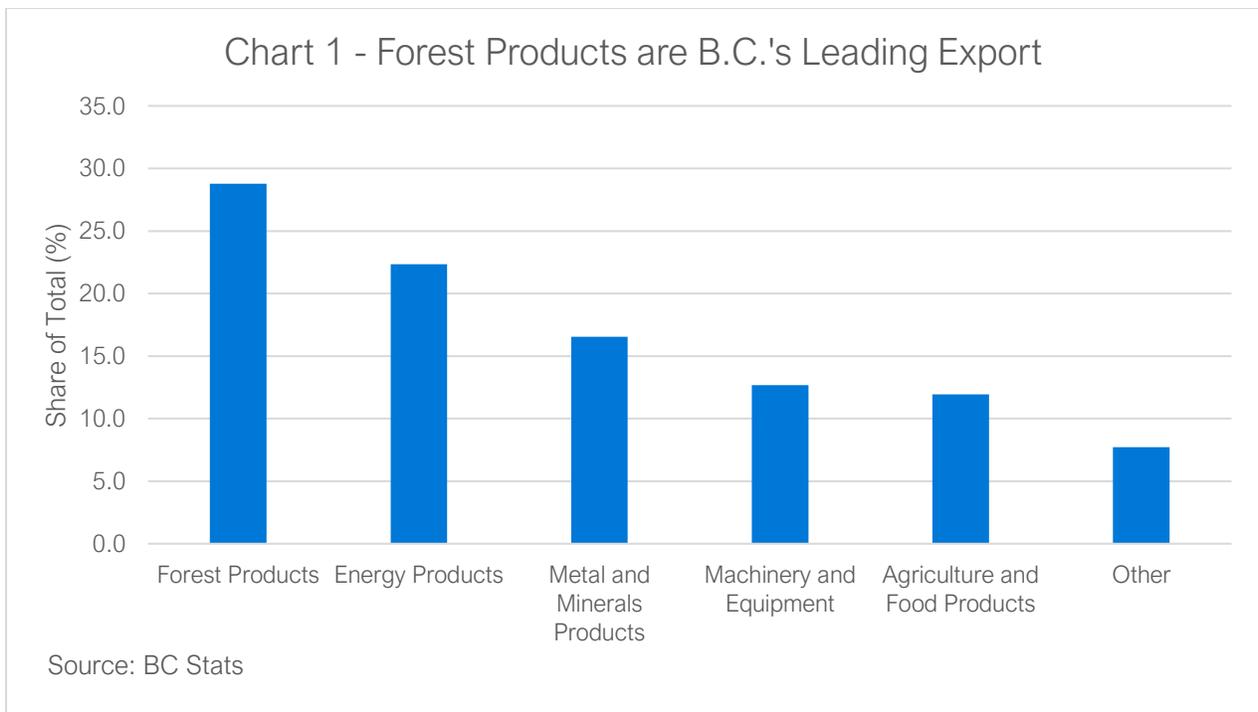
The benefits generated by forest sector activity do not just reside with those who are directly involved in the sector. Being a leading export industry, forest sector activity provides a solid base to the domestic economy, generating demand for other goods and services and creating tax revenues to government that fund critical services such as health and education. The purpose of the study

was to assess and quantify the total economic footprint of the forest sector on the provincial economy in 2019.

Statistics Canada's Interprovincial Input-Output model was used to obtain the direct, indirect and induced economic effects of forest sector operations for four key economic metrics:

1. Employment
2. Output
3. Gross Domestic Product (GDP)
4. Labour income

These economic metrics have been summarized at the provincial level and regionalized according to B.C.'s eight Economic Development Regions. The study also quantifies tax and other government revenues that can be attributed to forest sector activity; estimates are provided for provincial, federal and municipal levels of government. Finally, in addition to forest sector operations, the economic footprint associated with capital expenditures in the forest sector are presented. Following from what was outlined above, the remaining sections of the report are structured as follows:

Section 1 – Province-wide Economic Impacts

Section 2 – Regional Economic Impacts

Section 3 – Government Revenues

Section 4 – Capital Investment

To ensure the robustness of the study, an independent firm, PricewaterhouseCoopers (PwC), was engaged to review the methodology and calculations conducted for the purpose of this study. A brief description of this methodology can be found in the main body of the report. Further methodological details can be found in the **Appendix.**

SECTION ONE

Province-Wide Economic Impact

1.1   The Forest Sector

For the purposes of the study, the forest sector was defined using Statistics Canada's Input-Output Industry Classification (IOIC). There are seven sub-sectors that make up the broader forest sector. Below is a description of each of the sub-sectors along with their associated IOIC classification code.

- **Forestry and Logging** (BS113000) – This subsector is comprised of establishments that are primarily engaged in growing and harvesting timber. It includes those who develop and sell standing timber, forest nurseries and logging companies.

- **Support Activities for Forestry** (BS115300) – Service companies that support forestry and logging companies. This includes timber cruising and tree planting activities.

- **Sawmills and Wood Preservation** (BS321100) – Primarily manufacturing facilities that produce dimension lumber, shakes and shingles, as well as treated wood facilities.

- **Veneer, Plywood and Engineered Wood Product Manufacturing** (BS321200) – Firms that manufacture hardwood and softwood veneer and plywood. Also included in this category are companies that produce engineered wood products such as oriented strand board, finger-jointed lumber, laminated veneer lumber and glulam.

- **Other Wood Product Manufacturing** (BS321900) – Firms that produce millwork such as mouldings and softwood flooring. Also included in this sub-sector are companies that produce wooden boxes, pallets, as well as prefabricated buildings.

- **Pulp, Paper and Paperboard Mills** (BS322100) – This includes those that produce market pulp by mechanical and chemical methods, paper mills (including newsprint), and paperboard stock products such as cardboard.

- **Converted Paper Product Manufacturing** (BS322200) – Firms that manufacture paper products from paper and paperboard.

While estimates are available for each economic metric for all the sub-sectors listed above, for ease of exposition, the sub-sectors were aggregated into three groups, as described in **Table 1.**

Table 1. Forest Sector Groupings

Forestry, Logging and Support	Wood Products Manufacturing	Pulp and Paper Manufacturing
Forestry and Logging	Sawmills and Wood Preservation	Pulp, Paper and Paperboard Mills
Support Activities for Forestry	Veneer, Plywood and Engineered Wood Product Manufacturing	Converted Paper Product Manufacturing
	Other Wood Product Manufacturing	

1.2   Economic Metrics

Input-output analysis yields a rich set of data that captures the direct economic footprint of the forest sector as well as its interlinkages with other sectors. To quantify this footprint, four key indicators or metrics are provided. Below is a brief description of each metric:

- **Output** – This measure captures the total value of goods and services produced by the sector. Effectively it is the sales revenue obtained by the sector.[1] When aggregating across the supply chain, it includes some double counting as the value of intermediate goods are embedded in the metric. For example, consider a sawmill that produces lumber and sells it for $300/m^3. To produce the lumber, the sawmill needed to purchase and consume an intermediate product (logs) for $100/m^3, which was the output of a logging company. The aggregate output of the sawmilling and logging sector is $400/m^3, yet the value of the logs was already reflected in the output value of the sawmill.

- **Gross Domestic Product (GDP)** – GDP avoids the issue of double counting as it only includes the value added created along the supply chain. Value added for a given stage of production is the value of the final product less the value of intermediate products that are consumed. In the simple example given above, the value added of the sawmill is $200/m^3

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[1] Technically it also includes changes in the value of inventory.

($300/m^3 minus $100/m^3). Summing value added across the sub-sectors, yields the sector's contribution to GDP.[2]

- **Labour Income** – The value added created through a production process generates income that pays for other factors of production. In broad terms, these factors can be divided into labour and capital. Labour income represents labour's share of value added. It includes wages and salaries as well as employers' social contributions such as pension plans and employment insurance.

- **Employment** – The estimate of the total number of jobs covers two main categories: employee jobs and self-employed jobs. The total number of jobs includes full-time, part-time, temporary jobs and self-employed jobs. It does not consider the number of hours worked per employee.

For each of the four metrics outlined above, a direct, indirect and induced impact is calculated. The differences between the various impacts are as follows:

- **Direct impact** – Measures the initial requirements for an extra dollar's worth of output from the forest industry. The direct impact is a one dollar change in forest sector output to meet the change of one dollar in final demand for forest products. Associated with this change, there will also be direct impacts on GDP, jobs, etc.
- **Indirect impact** – Measures the changes due to inter-industry purchases as they respond to the new demands of the directly affected industries. This includes all the chain reaction of output up the production stream since each of the products purchased will require, in turn, the production of various inputs.
- **Induced impact** – Measures the changes in the production of goods and services in response to consumer expenditures induced by households' incomes (i.e., wages) generated by the production of the direct and indirect requirements.

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[2] Note that for the overall economy, summing up value added across all sectors is equivalent to the value of final (finished) products produced within a region.

Multipliers[3]

Multipliers are a simple measure that indicate the degree of spinoff impacts associated with a sector. There are two commonly referenced multipliers:

1. Type I = simple multiplier (direct + indirect) / direct impacts
2. Type II = total multiplier (direct + indirect + induced) / direct impact

For example, the type I employment multiplier reveals the direct and indirect impact on non-forestry jobs of one job in the forest industry. The same idea holds for the type II multiplier, except it also includes the induced impact.

1.3   Results by Sub-Sector

Having introduced the sub-sectors within the forest industry and the metrics and concepts associated with input-output analysis, this section summarizes the total economic impacts for each metric and subsector. Also included are the type I and type II job multipliers implied from the results.

Table 2. Output of B.C. Forest Sector, 2019 $CAD Billions (B)

Sector	Direct	Indirect	Induced	Total Impact
Forestry, Logging & Support	$6.11 B	$2.10 B	$1.36 B	$9.57 B
Wood Products Manufacturing	$10.39 B	$2.26 B	$1.78 B	$14.43 B
Pulp & Paper Manufacturing	$4.70 B	$1.93 B	$0.86 B	$7.49 B
Total Forest Sector	$21.20 B	$6.29 B	$4.00 B	$31.48 B

Table 3. GDP of B.C. Forest Sector, 2019 $CAD Billions (B)

Sector	Direct	Indirect	Induced	Total Impact
Forestry, Logging & Support	$2.82 B	$1.06 B	$0.88 B	$4.77 B
Wood Products Manufacturing	$3.13 B	$1.26 B	$1.16 B	$5.54 B
Pulp & Paper Manufacturing	$1.32 B	$1.08 B	$0.56 B	$2.95 B
Total Forest Sector	$7.27 B	$3.40 B	$2.59 B	$13.26 B

[3] To avoid double counting, multiplier estimates contained in this study are based on a delinked forest sector supply chain. See Appendix for further details.

Table 4. Labour Income B.C. Forest Sector, 2019 $CAD Billions (B)

Sector	Direct	Indirect	Induced	Total Impact
Forestry, Logging & Support	$1.52 B	$0.61 B	$0.33 B	$2.47 B
Wood Products Manufacturing	$2.62 B	$0.83 B	$0.55 B	$3.99 B
Paper Manufacturing	$0.97 B	$0.67 B	$0.26 B	$1.91 B
Total Forest Sector	$5.11 B	$2.11 B	$1.14 B	$8.37 B

Table 5. Employment of B.C. Forest Sector (number of jobs), 2019

Sector	Direct	Indirect	Induced	Total Impact
Forestry, Logging & Support	14,850	8,685	6,374	29,909
Wood Products Manufacturing	25,660	11,709	10,922	48,292
Pulp & Paper Manufacturing	7,755	9,712	5,697	23,164
Total Forest Sector	48,265	30,106	22,994	101,365

Table 6. Type I and Type II Employment Multipliers

Sector	Type I	Type II
Forestry, Logging & Support	1.6	2.0
Wood Products Manufacturing	1.5	1.9
Pulp & Paper Manufacturing	2.3	3.0
Total	1.6	2.1

1.4   Forest Sector Spinoff Effects

As indicated in Table 5, in 2019 there were 48,265 direct forestry jobs, which created an additional 53,100 indirect and induced jobs. In this section, the ripple or spinoff effects of forest sector activity (i.e., direct and indirect impacts) are unpacked to highlight the sectors that are most affected by the forest industry. Of the indirect and induced jobs, the top 10 impacted sectors and the jobs associated with them are shown in Chart 2.

Chart 2. Top 10 Sectors Impacted by Forest Sector Activity

SECTION TWO

Economic Impact by Region
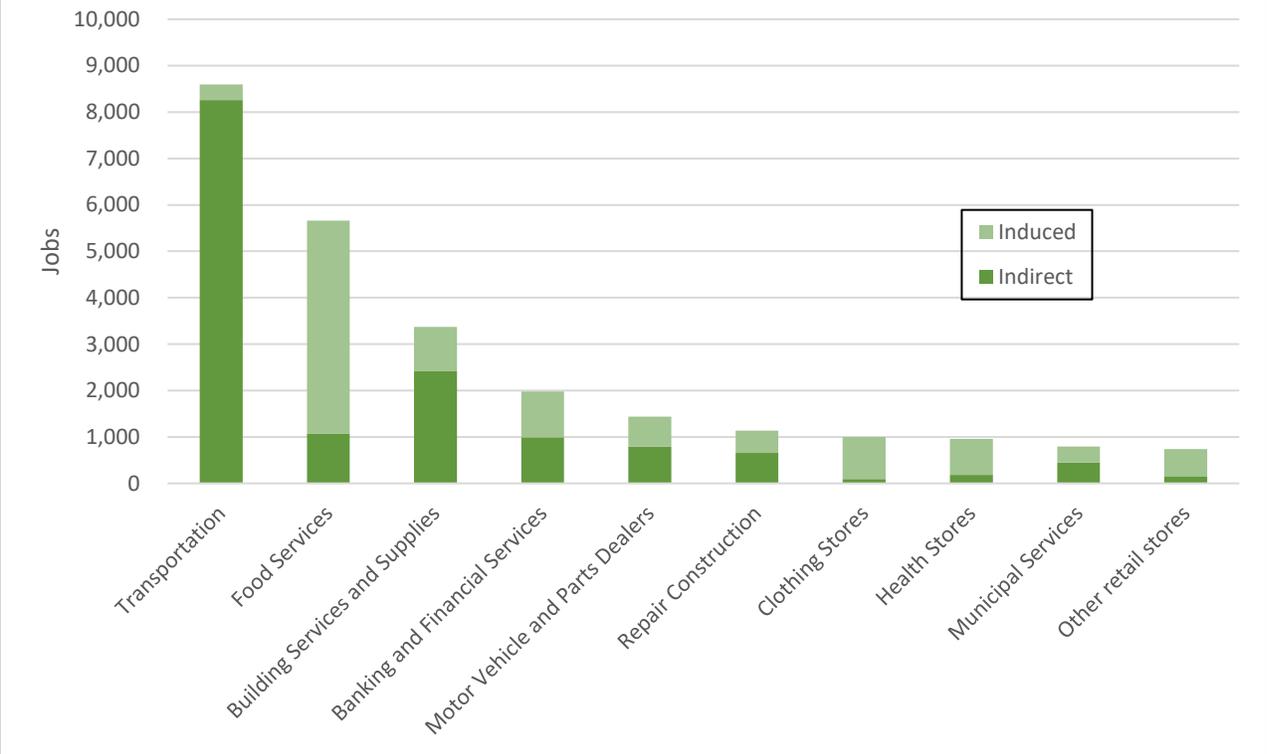
2.1   BC's Economic Development Regions

There are eight Economic Regions within British Columbia that are defined based on spatial aggregations of various census boundaries.[4] Economic activity in each of these is influenced by the forest sector. The regions include:

- **Vancouver Island/Coast** – This region includes all of Vancouver Island and the Gulf Islands. It encapsulates major urban centres, such as Victoria and Nanaimo, and contains some area on the Mainland in the Central Coast and around Powell River.
- **Mainland/Southwest** – Consists of the Greater Vancouver area, the Fraser Valley and the Sunshine Coast. The cities and surrounding area around Whistler, Pemberton and Lillooet are also part of this region.
- **Thompson/Okanagan** – This region is the most populated region in the Interior. It includes Kelowna and Kamloops and extends out to around Princeton in the west. It is bound by the Alberta border in the east, and the Washington state border in the south.
- **Kootenay** – The Kootenay economic region is situated in the southeastern corner of B.C. It includes cities such as Cranbrook, Castlegar and Nelson.
- **Cariboo** – A major forestry region that includes the cities of Prince George, Williams Lake and Quesnel. It includes the Cariboo-Chilcotin plateau and extends east to the Rockies.
- **North Coast** – The North Coast region covers the northwestern coastal areas of the province including Prince Rupert, Terrace and Kitimat. It also includes the islands of Haida Gwaii.
- **Nechako** – A large geographic region that includes the central Lakes District of the province and is separated from the northeastern section of the province by the Rocky Mountain Trench. It includes towns such as Vanderhoof, Burns Lake, and Smithers.
- **Northeast** – This region is part of the Peace River Basin. It is separated from the northwestern part of the province by the Rocky Mountain Trench. The main centres within the Northeast region are Fort St. John, Dawson Creek and Fort Nelson.

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[4] Census Boundaries - Province of British Columbia (gov.bc.ca)

Figure 1. There are eight Economic Development Regions within British Columbia.

2.2   Regionalization

To uncover the economic footprint of the forest sector in each of the regions, the economic impact results in Section One were regionalized by developing a location quotient based on regional labour force data. The location quotient is used to allocate the economic impact results across the regions.

The regionalization of the economic metrics across the eight Economic Development Regions, was achieved in the following four steps:

1. Total "experienced" labour force data for each Economic Development Region and four-digit North American Industry Classification System (NAICS) code was extracted. This data was obtained from Statistics Canada as a custom tabulation based on the 2016 census. This data counts those individuals who worked from January 2015 to May 2016 in the industry. We chose to use this rather than the employment data, which only counts those individuals who work in the industry in the week proceeding the census. Experienced labour force provides a more robust measure that is less influence by short-term fluctuations or seasonal variation. These labour force estimates were based on the place of work, rather than place of residence as it was believed to capture the distribution of economic impacts better.

2. The four-digit NAICS classification of the total labour force data by region was then mapped with the Input-Output Industry Classification (IOIC), which was the classification used for the economic impacts estimated through Statistics Canada's Input-Output model. The mapping was performed based on supplemental data from Statistics Canada on wages and salaries, total number of jobs and total compensation for B.C. This exercise yielded an estimate of the experienced labour force in B.C. by IOIC.

3. Employment ratios were then computed for each industry and region. The employment ratio being the share of the experienced labour in each region as a share of the entire B.C. experienced labour force for each industry.

4. Employment ratios were then applied to each corresponding industry's direct, indirect and induced impacts, resulting in region-specific impacts by industry.

2.3 Regional Results

Chart 3. Comparison of total economic impact by region

Legend:
- Wood Products Manufacturing
- Pulp & Paper Manufacturing
- Forestry and Logging

Y-axis: Billion $ (CAD)

Regions (each with Output, GDP, Labour Income):
- Vancouver Island and Coast
- Lower Mainland--Southwest
- Thompson--Okanagan
- Kootenay
- Cariboo
- North Coast
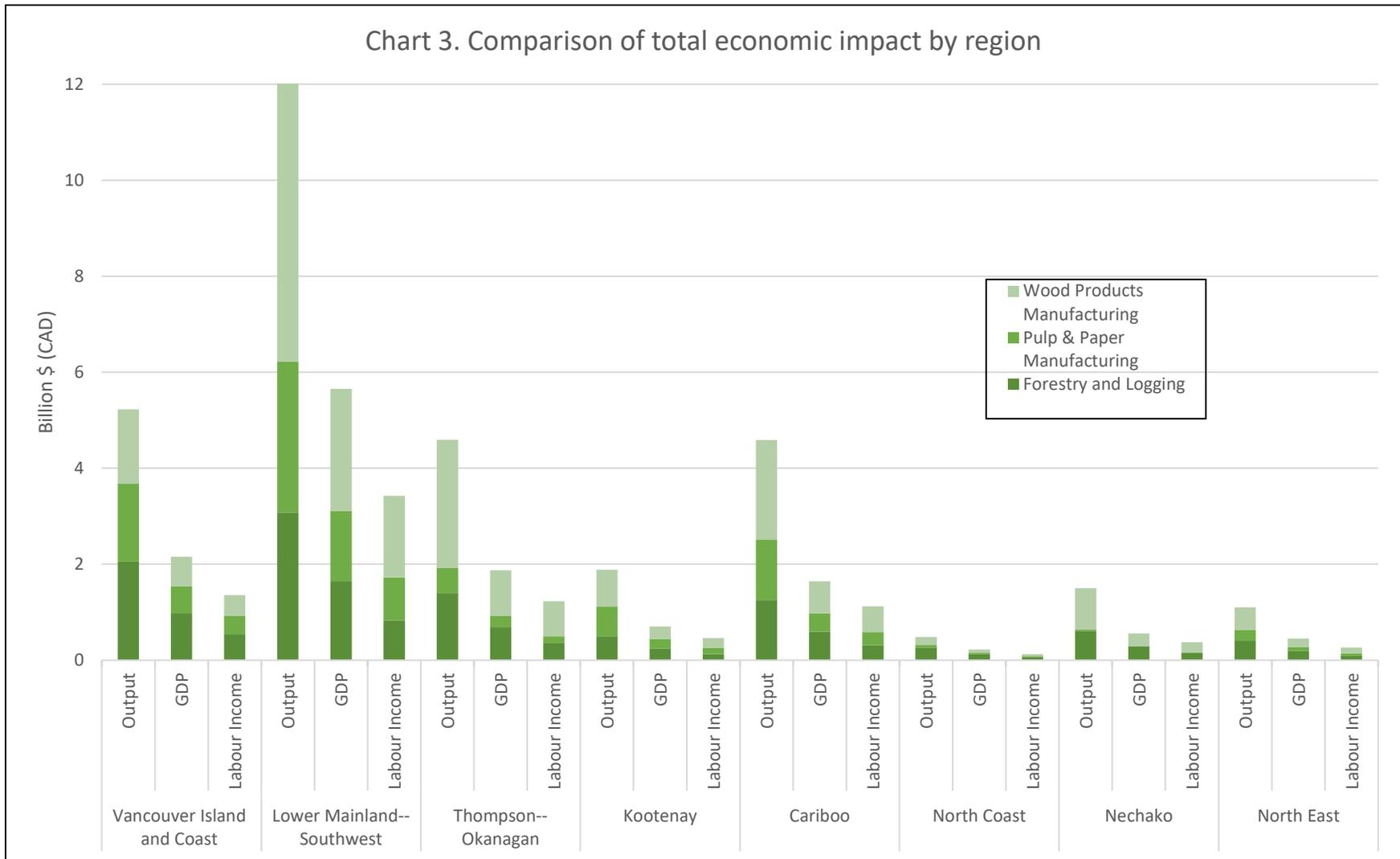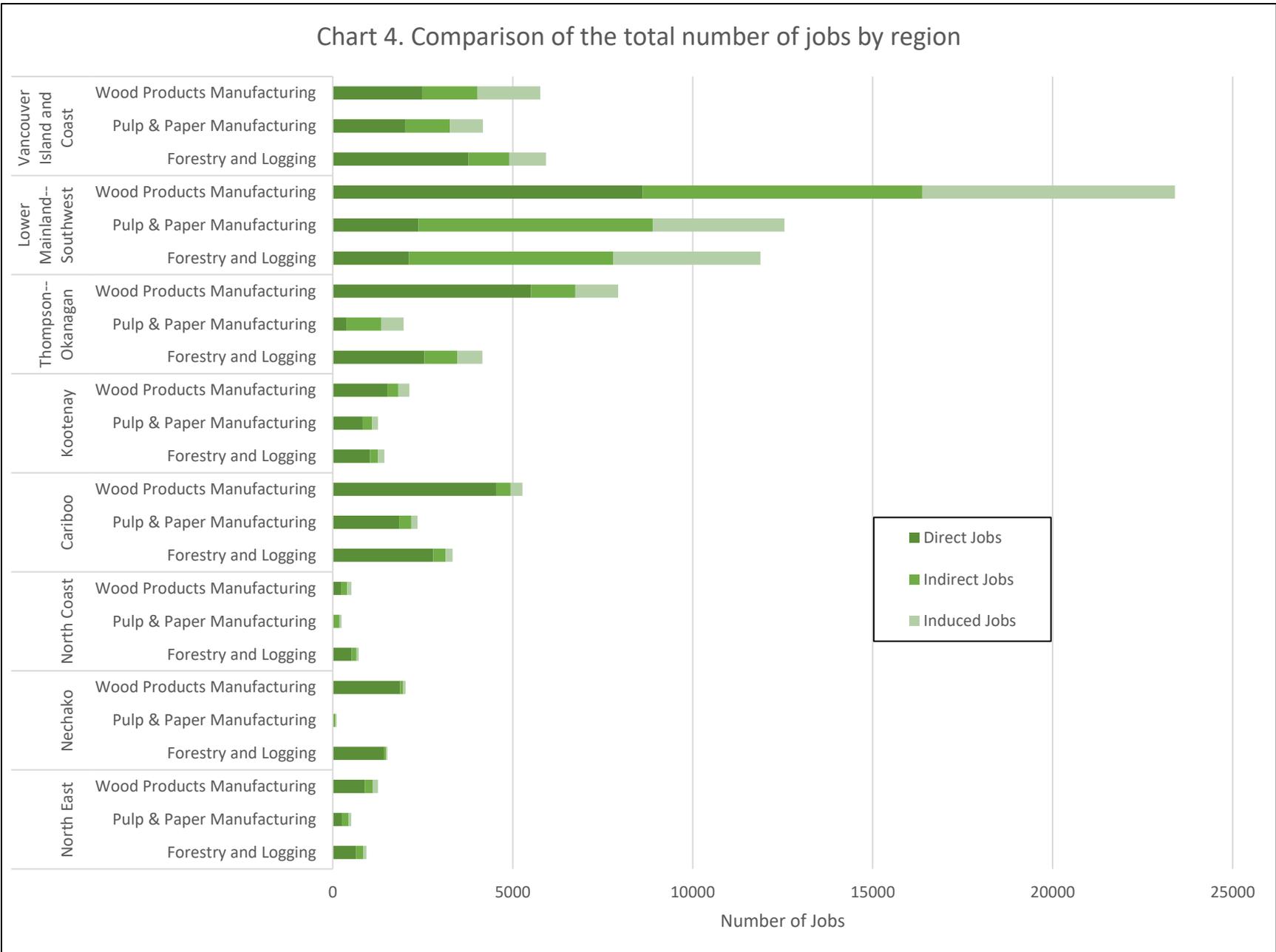- Nechako
- North East

Chart 4. Comparison of the total number of jobs by region

SECTION THREE

Government Revenues

3.1   Tax Revenues

When economic activity (i.e., output/GDP) occurs, it generates income for those who contributed capital and labour towards its creation. These income streams are ultimately subject to taxes, which fund various government services. Government tax revenue is also created from other sources such as the production and sale of products. In this section is a brief description of the key sources of government revenue. For each source, the revenue that can be attributed to forest sector activity was estimated, these results can be found in section 3.3.

- **Taxes on Products and Production** – Tax revenue is generated from the sale of products produced, or used by, the forest sector; this includes fuel and carbon taxes, Goods and Services Tax (GST) and Provincial Sales Tax (PST). Moreover, other taxes on production occur that are not necessarily linked to sales; this includes items such as property taxes or license fees.

- **Personal Income Tax (PIT)** – The PIT impacts were based on the labour income impact estimates and Statistics Canada data on primary household income and personal income tax (Table 36-10-0224-011). For British Columbia, the PIT share of primary household income was 17.3% in 2019. This ratio was then applied to the labour income impact estimates to come up with a corresponding PIT impact. To allocate the PIT impacts between federal and provincial governments, data from Statistics Canada that shows the level of household income tax collected by each government was utilized (Table 36-10-0450-01). For 2019, the overall federal share of PIT was 67%, whereas the provincial share was 33%.

- **Corporate Income Tax (CIT)** – The amount of value added is allocated between labour and capital. The Gross Operating Surplus (GOS) is the amount that is left over after labour income is deduced from value added; in other words, it is capital's share of value added. The CIT impacts were based on the GOS estimates derived from the Input-Output model. However, seeing that GOS reflects both corporate income as well as depreciation and amortization, an adjustment needs to be made to it before it can be used in the estimation of the amount of CIT that was paid. Supplemental data from Statistics Canada (Table: 36-10-0478-01 and Table: 33-10-0006-01) was used for this purpose. Using the most recent year of available data (2017), ratios between GOS and taxable income by sub-sector were established. From the same data, the effective federal and provincial CIT rates by industry were calculated. These ratios and rates were then applied to the 2019 GOS estimates for

each sub-sector to come up with an estimate of the level of CIT paid by the sector to provincial and federal governments.

3.2   Other Revenue

The forest sector also generates other revenue to government through various other fees. The most important ones being:

- **Logging tax** – The B.C. Logging Tax applies to entities that have income from logging operations on private or Crown land.
- **Stumpage** – Most of the raw materials used to produce forest products are derived from publicly owned standing timber. For instance, in 2019, 83% of the total annual harvest was from Crown land (**Chart 5**)[5]. The fee companies pay for this standing timber is called stumpage. Stumpage fees are set based on timber stand characteristics and market conditions, using an auction-based timber pricing system.[6]
- **Annual Rent** – In addition to stumpage fees, forest companies that have long-term tenures on public forestland are required to pay annual rents based on the amount of allowable annual cut they have.
- **Fee in Lieu** – The export of raw logs from British Columbia is regulated and subject to a surplus test where logs are first offered to domestic mills. If logs are deemed surplus to domestic manufacturing needs, they may be exported. However, in lieu of domestic manufacturing, the province charges a fee that depends on the value of the timber and the species.[7]

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[5] Source: Harvest Billing System

[6] See BC Timber Sales - Province of British Columbia (gov.bc.ca). BCTS auctions support the Market Pricing System, which is the main mechanism used to price public timber in British Columbia.

[7] See Fee in Lieu of Manufacture - Province of British Columbia (gov.bc.ca) for further details.

Chart 5. The majority of harvest took place on Crown land in 2019

17%

83%

■ Crown ■ Private
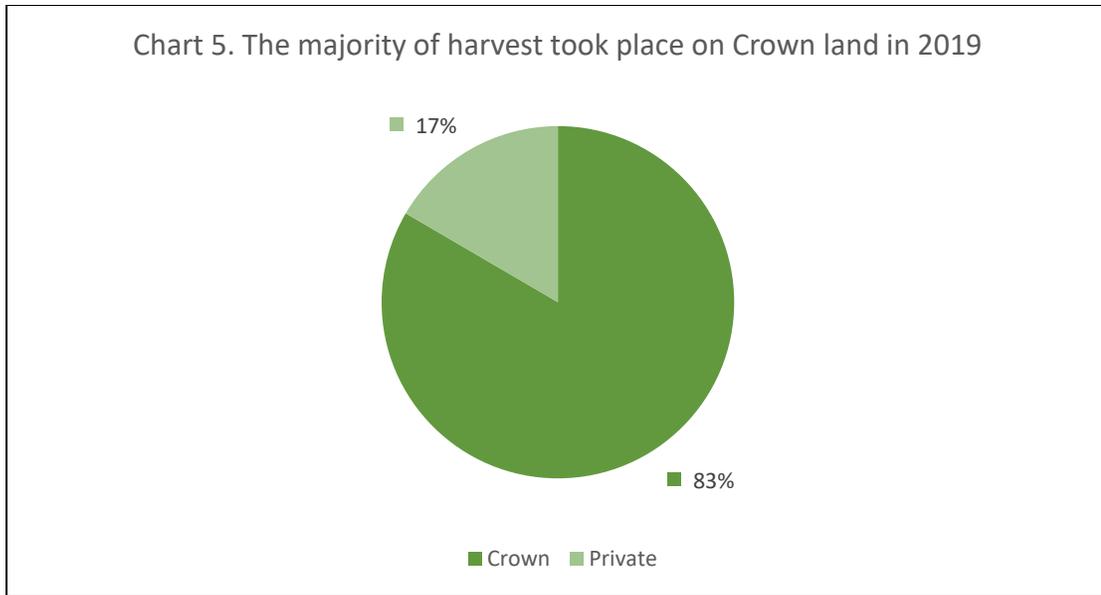
3.3   Government Revenue Estimates

Table 7. Revenues collected by the government attributed to the forest sector in 2019.[8]

Federal Government		$1,536 M
Products and production taxes, corporate and personal income taxes	$1,536 M	
Provincial Government		**$2,320 M**
Products and production taxes, corporate and personal income taxes	$1,317 M	
Logging tax	$28 M	
Stumpage	$932 M	
Annual Rent	$23 M	
Fee in Lieu	$20 M	
Municipal Government		$247 M
Products and production taxes	$247 M	
Total		$4,103 M

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[8] Other provincial revenues such as the logging tax, stumpage, annual rent and fee in lieu were not a product of the Input-Output model but instead were obtained directly from FLNRORD Timber Pricing Branch. The logging tax estimate is based on Fiscal Year 2019/20.

SECTION FOUR

Capital Investment

4.1   Capital Investment

What was presented in the previous sections was based on economic activity generated by the production of forest products. Additional economic contributions can be attributed to the forest industry because of its significant capital expenditures in the province. From 2010 to 2019, the forest sector invested about $14 billion in combined capital and repair expenditures.[9] Capital expenditures alone, which include expenditures related to construction, machinery and equipment, totaled over $6.4 billion from 2010 to 2019 (**Chart 6**). Repair expenditures, which also include expenditures related to maintenance, totaled $7.6 billion over a similar period (**Chart 7**).[10]

Chart 6. Capital Expenditure, 2010 to 2019 ($ million)

Legend: ■ Forestry and logging   ■ Pulp & Paper Manufacturing   ■ Wood product manufacturing

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Chart 7. Repair Expenditure, 2010 to 2018 ($ million)

Legend: ■ Forestry and logging ■ Pulp & Paper manufacturing ■ Wood product manufacturing
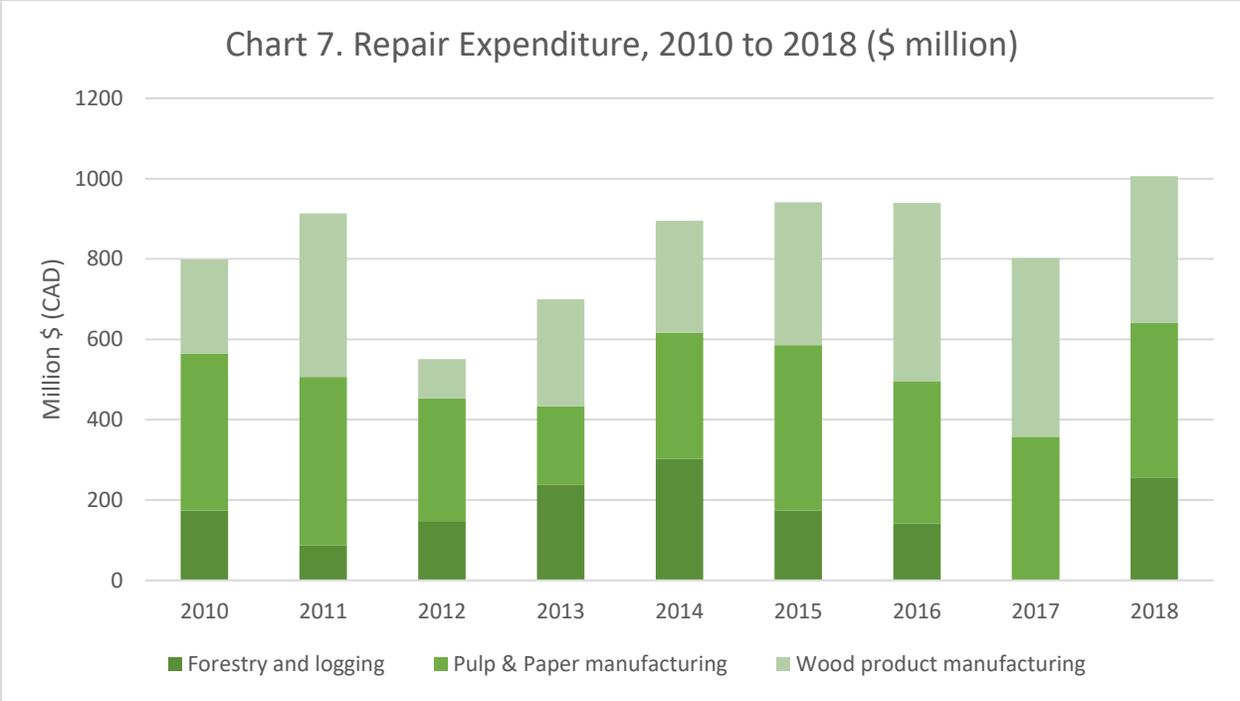
APPENDIX

A.1   Methodology

The following section describes some further details about the methodology associated with various aspects of the Economic Impact Study as well as key data sources and limitations.

Economic Impact Analysis has a long history and can take many forms. The most commonly used approach relies on Input-Output models that are based on supply and use accounts, which are part of the broader Canadian System of Macroeconomic Accounts.[11]

While Input-Output analysis is widely used and is very good at capturing the interlinkages in the economy at a particular point in time, there are several well-known limitations. The key ones being:

- The Input-Output model is based on the assumption of fixed technological coefficients. It does not take into account economies of scale, technological change, externalities, or responses to price changes. This makes impact analysis less accurate for long-term impacts as firms adjust their production technology and the Input-Output technological coefficients become outdated.
- The analysis says nothing about supply constraints associated with factors of production and whether they have been allocated to their highest valued use. In other words, the analysis does not consider the opportunity cost of labour and capital. For this reason, Input-Output results are thought to be most accurate when there is significant slack in the economy and less accurate under a full-employment situation.

Delinking the Forest Sector Supply Chain

The estimates for the economic impact were based on running Statistics Canada's Interprovincial Input-Output model for a shock on inputs. The shock values consisted of the intermediate inputs and primary inputs of the forestry sector industries as shown in the supply and use tables for British Columbia, at basic prices. To avoid double counting of the forest sector making purchases from itself, the intermediate consumption of the forestry products (defined as products primarily produced by the forestry sector industries) were zeroed out. In addition, the economic impact of the forestry sector industries appearing as indirect and induced effects were also zeroed out.

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[11] [Chapter 4 Supply and use accounts (statcan.gc.ca)](statcan.gc.ca)

Projecting Input-Output Results from 2017 to 2019[12]

The dollar value estimates provided in the study are all based on nominal values in 2019. At the time the study was conducted, nominal GDP by industry in current dollars was only directly available from Statistics Canada up until the year 2017. However, real GDP by industry (2012 Chained Dollars) is available from Statistics Canada up to 2019. From the two series we can get GDP deflators for 2017 as follows:

$$Deflator_t = \frac{Nominal_t}{Real_t} * 100$$

Since we do not have nominal GDP for 2018 and 2019, price indices for each sub-sector were used to calculate the deflators.

$$Deflator_{\{t+1\}} = \frac{P_{\{t+1\}}}{P_{\{t\}}} \times Deflator_{\{t\}}$$

Then nominal GDP can be forecasted as follows:

$$Nominal\ GDP_{\{t+1\}} = Deflator_{\{t+1\}} * Real\ GDP_{\{t+1\}}$$

Now the % change from Base IO Year GDP is calculated as follows:

$$\%\ change\ in\ Nominal\ GDP = \frac{Projected\ Nominal\ GDP_{\{t+1\}}}{IO\ Base\ Year\ GDP_{\{t\}}} - 1$$

This GDP growth rate was then applied to Output, GDP (at market prices) taxes on products and production, and gross operating surplus to get the projected nominal impacts for 2019. Such an exercise was not necessary for both direct labor income and the number of jobs as these values were directly available from Statistics Canada tables (Table: 36-10-0480-01) and the indirect and induced impacts were calculated using the corresponding multipliers.

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[12] In discussions with Natural Resources Canada, they indicated that a similar approach was taken in their estimates of nominal GDP by resource sector for Canada in 2019. 10 Key Facts on Canada's Natural Resources (nrcan.gc.ca)

A.2   Data

Economic metrics for the Vancouver Island/Coast development region, 2019 $CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	$1607.7M	$244.5M	$202.4M	$2054.5M
	Wood Products Manufacturing	$1016.9M	$263.1M	$266.0M	$1546.0M
	Pulp & Paper Manufacturing	$1275.3M	$221.8M	$127.7M	$1624.9M
	Total	**$3899.9M**	**$729.4M**	**$596.1M**	**$5225.4M**
GDP	Forestry, Logging & Support	$730.5M	$123.0M	$132.7M	$986.2M
	Wood Products Manufacturing	$304.4M	$140.3M	$174.5M	$619.3M
	Pulp & Paper Manufacturing	$352.6M	$114.5M	$83.8M	$550.9M
	Total	**$1387.5M**	**$377.8M**	**$391.0M**	**$2156.3M**
Labour Income	Forestry, Logging & Support	$407.6M	$77.2M	$50.0M	$534.9M
	Wood Products Manufacturing	$254.1M	$101.1M	$83.9M	$439.1M
	Pulp & Paper Manufacturing	$264.3M	$81.2M	$39.8M	$385.2M
	Total	**$926.0M**	**$259.5M**	**$173.7M**	**$1359.2M**
Employment	Forestry, Logging & Support	3,775	1,129	1,020	5,925
	Wood Products Manufacturing	2,491	1,529	1,748	5,768
	Pulp & Paper Manufacturing	2,025	1,234	912	4,171
	Total	**8,291**	**3,893**	**3,679**	**15,864**

Economic metrics for the Mainland/Southwest development region, 2019 $CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	$849.7M	$1342.4M	$887.2M	$3079.3M
	Wood Products Manufacturing	$3228.6M	$1487.4M	$1165.8M	$5881.8M
	Pulp & Paper Manufacturing	$1319.1M	$1266.5M	$559.8M	$3145.4M
	Total	**$5397.4M**	**$4096.3M**	**$2612.7M**	**$12106.5M**
GDP	Forestry, Logging & Support	$397.2M	$684.5M	$570.5M	$1652.3M
	Wood Products Manufacturing	$962.9M	$829.9M	$750.1M	$2542.8M
	Pulp & Paper Manufacturing	$384.4M	$712.1M	$360.1M	$1456.6M
	Total	**$1744.5M**	**$2226.5M**	**$1680.7M**	**$5651.7M**
Labour Income	Forestry, Logging & Support	$209.5M	$406.0M	$215.2M	$830.7M
	Wood Products Manufacturing	$782.4M	$557.8M	$360.8M	$1701.1M
	Pulp & Paper Manufacturing	$271.7M	$453.4M	$171.0M	$896.1M
	Total	**$1263.6M**	**$1417.3M**	**$747.0M**	**$3427.9M**
Employment	Forestry, Logging & Support	2,118	5,669	4,097	11,884
	Wood Products Manufacturing	8,611	7,766	7,020	23,397
	Pulp & Paper Manufacturing	2,383	6,505	3,660	12,548
	Total	**13,112**	**19,940**	**14,777**	**47,829**

Economic metrics for the Thompson/Okanagan development region, 2019 $CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	$1038.5M	$220.0M	$143.7M	$1402.1M
	Wood Products Manufacturing	$2244.8M	$236.2M	$188.7M	$2669.7M
	Pulp & Paper Manufacturing	$243.9M	$185.7M	$90.7M	$520.3M
	Total	**$3527.1M**	**$641.8M**	**$423.1M**	**$4592.1M**
GDP	Forestry, Logging & Support	$481.3M	$112.1M	$93.9M	$687.3M
	Wood Products Manufacturing	$695.1M	$133.1M	$123.4M	$951.7M
	Pulp & Paper Manufacturing	$67.7M	$108.3M	$59.3M	$235.3M
	Total	**$1244.1M**	**$353.6M**	**$276.5M**	**$1874.2M**
Labour Income	Forestry, Logging & Support	$258.2M	$62.6M	$34.6M	$355.4M
	Wood Products Manufacturing	$589.8M	$84.3M	$58.0M	$732.1M
	Pulp & Paper Manufacturing	$50.5M	$64.0M	$27.5M	$142.0M
	Total	**$898.6M**	**$210.9M**	**$120.1M**	**$1229.6M**
Employment	Forestry, Logging & Support	2,543	919	695	4,157
	Wood Products Manufacturing	5,504	1,234	1,191	7,928
	Pulp & Paper Manufacturing	391	956	622	1,970
	Total	**8,438**	**3,109**	**2,508**	**14,055**

Economic metrics for the Kootenay development region, 2019 $CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	$414.4M	$48.5M	$36.7M	$499.6M
	Wood Products Manufacturing	$663.5M	$59.2M	$48.2M	$770.8M
	Pulp & Paper Manufacturing	$529.4M	$64.2M	$23.2M	$616.7M
	Total	**$1607.2M**	**$171.8M**	**$108.1M**	**$1887.1M**
GDP	Forestry, Logging & Support	$193.8M	$25.7M	$24.7M	$244.2M
	Wood Products Manufacturing	$194.9M	$35.2M	$32.5M	$262.6M
	Pulp & Paper Manufacturing	$146.4M	$35.7M	$15.6M	$197.7M
	Total	**$535.1M**	**$96.6M**	**$72.8M**	**$704.5M**
Labour Income	Forestry, Logging & Support	$102.1M	$14.6M	$8.8M	$125.5M
	Wood Products Manufacturing	$164.1M	$20.5M	$14.8M	$199.4M
	Pulp & Paper Manufacturing	$109.7M	$18.4M	$7.0M	$135.1M
	Total	**$376.0M**	**$53.5M**	**$30.6M**	**$460.1M**
Employment	Forestry, Logging & Support	1,034	222	181	1,437
	Wood Products Manufacturing	1,519	301	310	2,130
	Pulp & Paper Manufacturing	842	251	162	1,255
	Total	**3,394**	**774**	**654**	**4,821**

Economic metrics for the Cariboo development region, 2019 $CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	$1118.5M	$90.4M	$40.6M	$1249.5M
	Wood Products Manufacturing	$1930.6M	$87.3M	$53.4M	$2071.3M
	Pulp & Paper Manufacturing	$1162.5M	$78.7M	$25.7M	$1266.8M
	Total	**$4211.6M**	**$256.4M**	**$119.6M**	**$4587.6M**
GDP	Forestry, Logging & Support	$523.2M	$44.9M	$27.1M	$595.2M
	Wood Products Manufacturing	$584.8M	$48.7M	$35.6M	$669.1M
	Pulp & Paper Manufacturing	$321.4M	$44.5M	$17.1M	$383.0M
	Total	**$1429.4M**	**$138.1M**	**$79.8M**	**$1647.3M**
Labour Income	Forestry, Logging & Support	$275.5M	$23.9M	$9.7M	$309.1M
	Wood Products Manufacturing	$496.5M	$28.8M	$16.2M	$541.6M
	Pulp & Paper Manufacturing	$240.9M	$24.4M	$7.7M	$273.0M
	Total	**$1013.0M**	**$77.2M**	**$33.6M**	**$1123.7M**
Employment	Forestry, Logging & Support	2792	344	191	3327
	Wood Products Manufacturing	4536	408	327	5271
	Pulp & Paper Manufacturing	1846	341	171	2358
	Total	**9174**	**1093**	**688**	**10956**

Economic metrics for the North Coast development region, 2019 $CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	$213.1M	$34.4M	$15.1M	$262.5M
	Wood Products Manufacturing	$103.8M	$40.0M	$19.8M	$163.6M
	Pulp & Paper Manufacturing	$6.3M	$41.1M	$9.5M	$56.9M
	Total	**$323.1M**	**$115.5M**	**$44.4M**	**$483.0M**
GDP	Forestry, Logging & Support	$99.2M	$17.1M	$10.0M	$126.3M
	Wood Products Manufacturing	$29.9M	$21.5M	$13.1M	$64.5M
	Pulp & Paper Manufacturing	$1.7M	$22.3M	$6.3M	$30.4M
	Total	**$130.8M**	**$60.9M**	**$29.4M**	**$221.2M**
Labour Income	Forestry, Logging & Support	$52.7M	$9.9M	$3.4M	$66.0M
	Wood Products Manufacturing	$25.1M	$13.2M	$5.7M	$44.1M
	Pulp & Paper Manufacturing	$1.3M	$12.9M	$2.7M	$16.9M
	Total	**$79.2M**	**$36.0M**	**$11.9M**	**$127.0M**
Employment	Forestry, Logging & Support	527	131	66	725
	Wood Products Manufacturing	230	174	113	517
	Pulp & Paper Manufacturing	10	173	59	243
	Total	**767**	**479**	**239**	**1484**

Economic metrics for the Nechako development region, 2019 $CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	$588.5M	$16.1M	$8.6M	$613.2M
	Wood Products Manufacturing	$835.4M	$16.5M	$11.4M	$863.2M
	Pulp & Paper Manufacturing	$6.3M	$12.4M	$5.5M	$24.2M
	Total	**$1430.2M**	**$45.0M**	**$25.5M**	**$1500.6M**
GDP	Forestry, Logging & Support	$270.5M	$7.8M	$5.9M	$284.2M
	Wood Products Manufacturing	$243.7M	$9.1M	$7.7M	$260.5M
	Pulp & Paper Manufacturing	$1.7M	$7.0M	$3.7M	$12.4M
	Total	**$516.0M**	**$23.9M**	**$17.3M**	**$557.1M**
Labour Income	Forestry, Logging & Support	$147.5M	$4.4M	$2.0M	$153.9M
	Wood Products Manufacturing	$205.7M	$5.7M	$3.3M	$214.7M
	Pulp & Paper Manufacturing	$1.3M	$4.2M	$1.6M	$7.1M
	Total	**$354.5M**	**$14.4M**	**$6.8M**	**$375.7M**
Employment	Forestry, Logging & Support	1417	63	40	1520
	Wood Products Manufacturing	1875	80	68	2023
	Pulp & Paper Manufacturing	10	62	36	107
	Total	**3301**	**205**	**143**	**3650**

Economic metrics for the Northeast development region, 2019 $CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	$277.1M	$104.3M	$22.8M	$404.2M
	Wood Products Manufacturing	$368.7M	$67.8M	$29.9M	$466.4M
	Pulp & Paper Manufacturing	$156.7M	$58.8M	$14.4M	$229.9M
	Total	**$802.5M**	**$230.9M**	**$67.2M**	**$1100.5M**
GDP	Forestry, Logging & Support	$125.3M	$49.9M	$14.7M	$189.8M
	Wood Products Manufacturing	$115.7M	$37.3M	$19.3M	$172.3M
	Pulp & Paper Manufacturing	$43.3M	$34.1M	$9.3M	$86.7M
	Total	**$284.3M**	**$121.3M**	**$43.2M**	**$448.8M**
Labour Income	Forestry, Logging & Support	$70.6M	$15.6M	$4.6M	$90.8M
	Wood Products Manufacturing	$99.1M	$15.9M	$7.6M	$122.6M
	Pulp & Paper Manufacturing	$32.5M	$14.3M	$3.6M	$50.4M
	Total	**$202.1M**	**$45.9M**	**$15.8M**	**$263.8M**
Employment	Forestry, Logging & Support	644	207	85	936
	Wood Products Manufacturing	895	217	145	1257
	Pulp & Paper Manufacturing	249	189	76	514
	Total	**1787**	**613**	**306**	**2706**

A.3 Acknowledgements

This report was prepared by the following COFI staff:

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COFI would like to thank the Economic Services Branch of the B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development for their extensive collaboration on study design and development as well as for their comments on earlier drafts of this report, although any errors or omissions are solely the responsibility of the authors.

COFI would also like to thank members within the Industry Accounts Division from Statistics Canada for their help with identifying data sources.