Technical Report

The Economic Impact of British Columbia's Forest Sector

April 2024

BDO

BC COUNCIL OF FOREST INDUSTRIES

Acknowledgements

The following COFI staff prepared this report:

- Kurt Niquidet, Ph.D., Vice President and Chief Economist
- Jonathan Kan, RPF, Manager, Data & Analytics
- Kyle Sia-Chan, MBA, Manager, Economics & Finance

COFI would like to thank the Economics and Trade Branch of the B.C. Ministry of Forests for their collaboration and partnership on this project. Any errors or omissions are solely the responsibility of the authors.

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

About the Study

The BC Council of Forest Industries (COFI) conducted the study. COFI represents 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 he is an Adjunct Professor in the Faculties of Forestry and Land and Food Systems at the University of British Columbia.

Most of the data that forms the basis of the study was sourced from Statistics Canada. The study measures 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. The study showcases the economic impacts of the sector for the year 2022.

To ensure the accuracy of the study's findings, an independent firm, BDO Canada LLP (BDO), was engaged to review the methodology and calculations conducted for this study. The conclusions from their review are summarized below.

This letter provides support for the methodology employed and the results obtained from the Economic Impact Study (the "Study") conducted by the Council of Forest Industries ("COFI"). BDO Canada LLP ("BDO" or "we") was engaged by COFI to provide independent external validation on the Study's findings, ensuring its accuracy and reliability.

As independent economists, we objectively reviewed and evaluated the Study's findings and methodology.

The Economic Impact Study highlights the vital role of British Columbia's ("B.C.") forest sector in supporting economic activity across the province. The main findings of the study indicate that B.C.'s forest sector operations support significant employment generation, value-added activity, labour income, and government revenue. The detailed breakdown, by sub-sector, aggregated into three groups and economic metrics, offers important insights into the forest sector's contributions to the provincial economy.

The data used in the Study was primarily sourced from Statistics Canada, a reliable and leading source for Canadian economic statistics. The use of Statistics Canada's Interprovincial Input-Output model is statistically sound and valid. The input-output approach is not only in line with industry standards but is also a widely recognized and accepted practice when conducting economic impact analyses.

We have carefully reviewed and assessed all the supporting calculations used in the Study, and we affirm our trust in the methodology and calculations, which lend support to the Study's findings.

To sum up, we support the Economic Impact Study and its findings. We believe that this Study will be an invaluable resource for policymakers and the broader community to comprehend the economic significance of B.C.'s forest industry.

Jamal Hejazi, PhD

Jamal Hejazi

Chief Economist, Economic Consulting Practice
BDO Canada LLP

Report Summary

Forestry is foundational to British Columbia (B.C.), supporting economic activity in all regions of the province. To quantify the total contribution of the forest industry 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 2022, forest sector operations generated the following levels of economic activity:

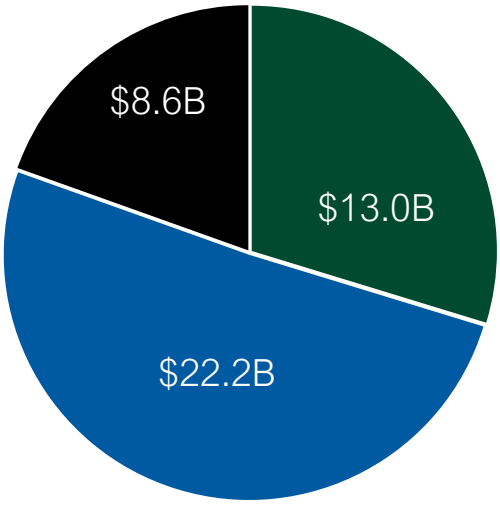
- Approximately 100,000 total jobs spread throughout the province, with over one quarter (26,000) of the jobs located in the Lower Mainland and Southwest Region.
- $17.4 billion in value-added activity (i.e., gross domestic product or GDP) with $5.5 billion derived from forestry, logging, and support activities; $8.3 billion from wood products manufacturing; and $3.6 billion from pulp and paper manufacturing.
- Approximately $9.1 billion in labour income, which includes wages and salaries as well as social contributions from employers such as contributions to pension plans.
- $6.6 billion in government revenue with $4.0 billion going to the provincial government, $2.3 billion to the federal government and $325 million to municipal governments.

In addition, between 2013 and 2022, approximately $15.8 billion was invested in B.C. by the forest sector in capital expenditures, repair, and maintenance.

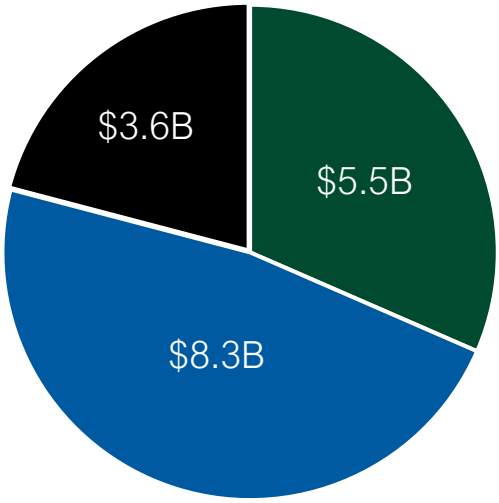
Summary of Forestry's Economic Impact in BC (2022)

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

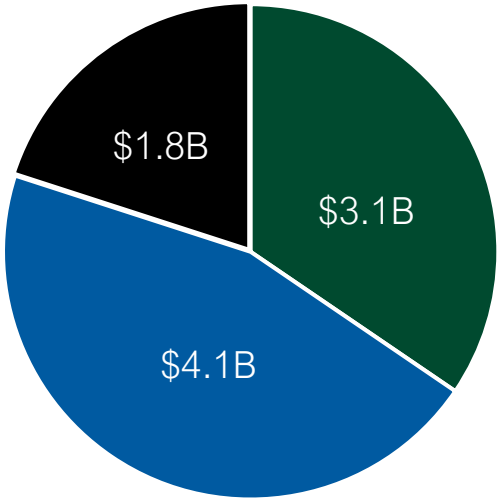
Output - **$43.9 Billion**



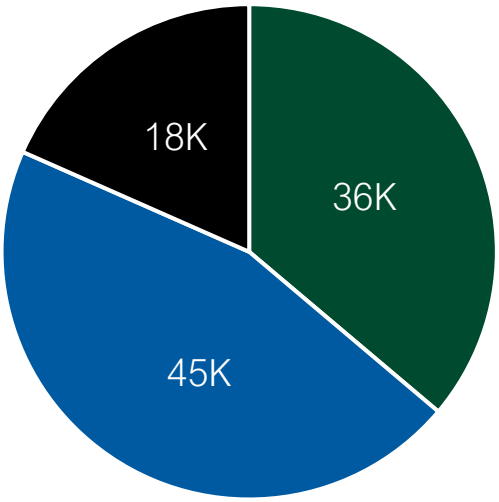
GDP - **$17.4 Billion**



Labour Income - **$9.1 Billion**



Employment - **100K Jobs**



Summary of Forestry's Regional Economic Benefits

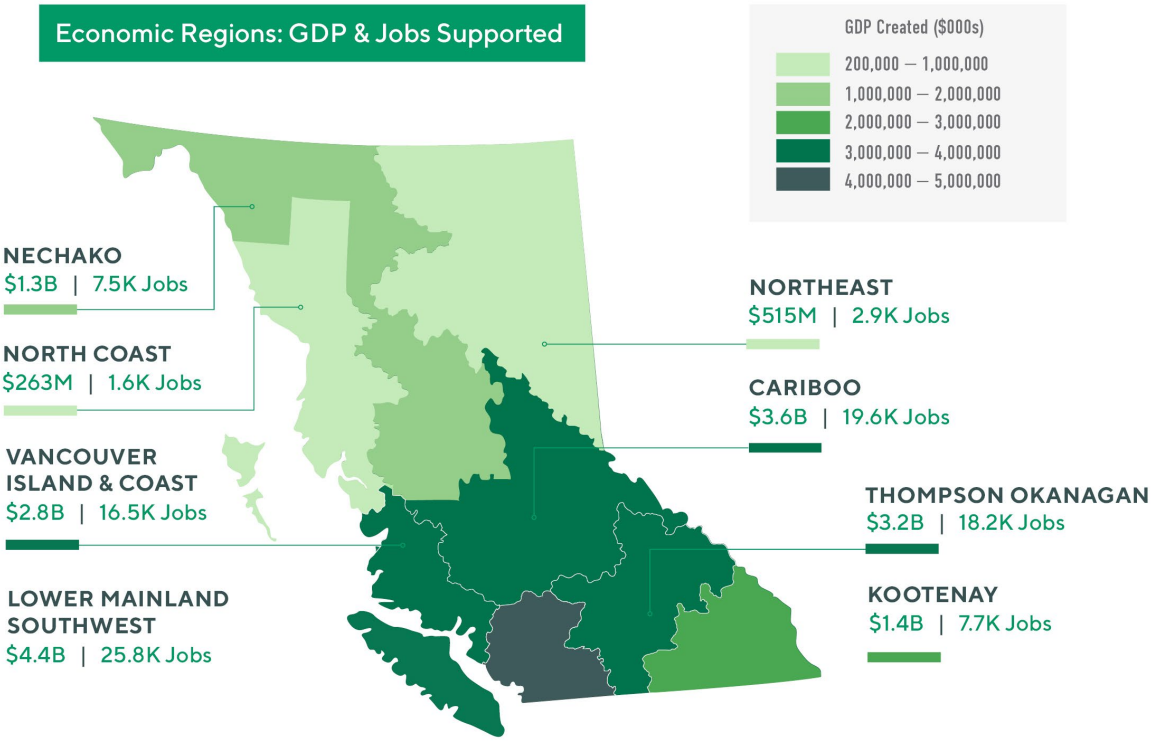


Table of Contents

Introduction 1

Section One – Province-Wide Economic Impacts 3

1.1 The Forest Sector 4

1.2 Economic Metrics 5

1.3 Results by Sub-Sector 7

1.4 Forest Sector Spinoff Effects 9

1.5 Jobs & Harvest 10

Section Two: Economic Impact by Region 13

2.1 B.C.'s Economic Development Regions 14

2.2 Regionalization 15

2.3 Regional Results 17

Section Three: Government Revenues 20

3.1 Tax Revenues 21

3.2 Other Revenue 22

3.3 Government Revenue Estimates 24

Section Four: Capital Investments 25

4.1 Capital Investment 26

Appendix 27

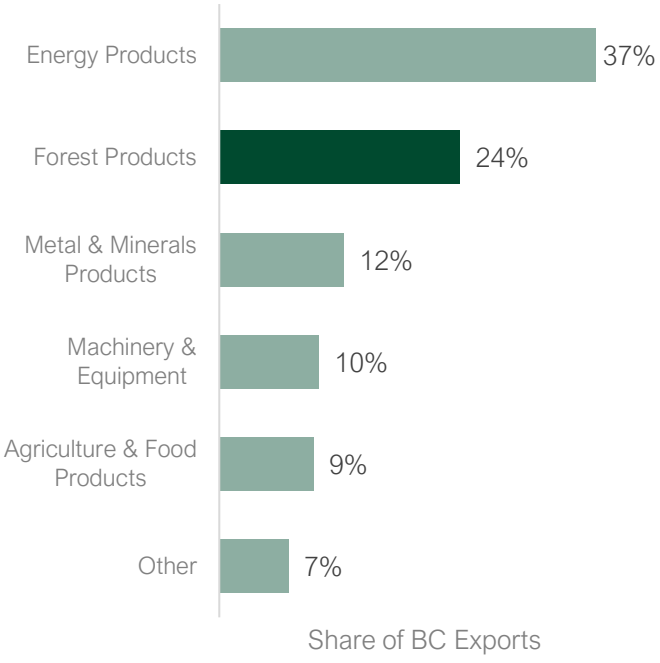
A.1 Methodology 27

A.2 Data 30

Introduction

The forest industry forms an important part of British Columbia's (B.C.) economic base. Forestry activities contribute to regional economic development and are a source of economic benefits for all British Columbians. While the provincial economy is constantly evolving and has become more diversified over time, the role of the forest sector remains foundational to the economy, especially in regional communities across the province. In 2022, forest products were B.C.'s number two export category, representing 24% of all merchandise exports by value (Chart 1). Further, global demand for forest products is projected to be strong in the years ahead due to growth in both traditional (e.g., United States housing market) and emerging forest products markets such as mass timber and the circular bioeconomy.[1]

Chart 1 - **Forest products rank second to energy as B.C.'s leading export**



Source: BC Stats (2022)

The benefits generated by forest sector activity do not just reside with those who are directly involved in the sector. Most of the inputs used by the forest industry are sourced locally, which means that forest sector activity also creates spinoff effects by generating demand for other B.C. goods and services. This economic activity creates tax revenues for the government that fund public services such as health, education, and infrastructure. The

[1] Global forest sector outlook 2050: Assessing future demand and sources of timber for a sustainable economy (fao.org)

purpose of the study was to assess and quantify the total economic footprint of the forest sector on the provincial economy in 2022.[2]

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

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

These economic metrics are presented 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 all levels of government: provincial, federal, and municipal. In addition to forest sector operations, the economic footprint associated with capital expenditures in the forest sector is presented. 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

An independent firm, BDO Canada LLP (BDO), was engaged to review the methodology and calculations conducted for 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 Appendices.

[2] The economic impacts presented in the report are based on data availability as of March 2024. The estimates could change in the future due to data revisions from Statistics Canada or other sources.

SECTION ONE

Province-Wide Economic Impacts

1.1 The Forest Sector

For the study, the forest sector was defined using Statistics Canada's Input-Output Industry Classification (IOIC). Seven sub-sectors make up the broader forest sector.[3] 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 mass timber.
- Other Wood Product Manufacturing (BS321900) – Firms that produce millwork such as mouldings and softwood flooring as well as those that produce wooden boxes, pallets, prefabricated buildings, and wood pellets.
- Pulp, Paper, and Paperboard Mills (BS322100) – This includes those that produce market pulp by mechanical and chemical methods as well as paper mills.
- Converted Paper Product Manufacturing (BS322200) – Firms that manufacture paper products from purchased paper and paperboard.

[3] Electricity generation from biomass is not included in the analysis due to data availability.

While estimates are available for each economic metric for all the sub-sectors listed above, for ease of exposition, they are 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

The input-output analysis yields a rich set of data that captures the forest sector's direct economic footprint and 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.[4] When aggregating across the supply chain, it includes some double counting as the value of intermediate goods is 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.
- **Value-added or Gross Domestic Product (GDP)** – GDP avoids the issue of double counting as it only includes the value added created along the supply chain. The value added for a given production stage is the final product's value less that of intermediate products used as inputs in the production process. In the simple example given above, the value added of the sawmill is $200/m^3 ($300/m^3 minus

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

$100/m^3$). Summing value added across the supply chain yields the forest sector's contribution to GDP.[5]

- 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, 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 jobs or economic activity directly associated with the forest industry (e.g., working in forest management, logging, or manufacturing).
- Indirect impact – Measures the economic impacts associated with other sectors that are suppliers to the forest industry (e.g., transportation sector).
- Induced impact – Measures the economic effects created by the expenditure of income generated by direct and indirect forestry-related activities.

[5] 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[6]

Multipliers are simple measures that indicate the degree of spinoff impacts associated with a sector and can help us understand how the creation of one job in the forest sector can have positive ripple effects in other sectors. 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

The type I employment multiplier reveals the indirect impact on non-forestry jobs of one direct job in the forest industry. As a simple illustration, if one direct sawmill job is created, and it generates an additional indirect trucking job, the Type I multiplier would be 2. 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. Included are the type I and type II job multipliers implied from the results.

Table 2. Output of B.C. Forest Sector, 2022 CAD Billions (B)

Sector	Direct	Indirect	Induced	Total Impact
Forestry, Logging & Support	$8.1B	$3.1B	$1.8B	$13.0B
Wood Products Manufacturing	$16.1B	$3.6B	$2.5B	$22.2B
Pulp & Paper Manufacturing	$5.3B	$2.3B	$1.0B	$8.6B
Total Forest Sector	$29.5B	$9.0B	$5.3B	$43.9B

Table 3. GDP of B.C. Forest Sector, 2022 CAD Billions (B)

Sector	Direct	Indirect	Induced	Total Impact
Forestry, Logging & Support	$3.1B	$1.3B	$1.1B	$5.5B
Wood Products Manufacturing	$4.5B	$2.0B	$1.8B	$8.3B
Pulp & Paper Manufacturing	$1.4B	$1.5B	$0.8B	$3.6B
Total Forest Sector	$8.9B	$4.8B	$3.6B	$17.4B

[6] To avoid double counting, multiplier estimates contained in this study are based on a delinked forest sector supply chain. .

Table 4. Labour Income B.C. Forest Sector, 2022 CAD Billions (B)

Sector	Direct	Indirect	Induced	Total Impact
Forestry, Logging & Support	$1.9B	$0.9B	$0.4B	$3.1B
Wood Products Manufacturing	$2.6B	$1.0B	$0.5B	$4.1B
Pulp & Paper Manufacturing	$0.9B	$0.7B	$0.2B	$1.8B
Total Forest Sector	$5.4B	$2.5B	$1.2B	$9.1B

Table 5. Employment of B.C. Forest Sector (number of jobs), 2022

Sector	Direct	Indirect	Induced	Total Impact
Forestry, Logging & Support	17,890	11,084	7,141	36,115
Wood Products Manufacturing	23,895	12,155	9,342	45,392
Pulp & Paper Manufacturing	6,940	7,439	3,982	18,361
Total Forest Sector	48,725	30,678	20,465	99,868

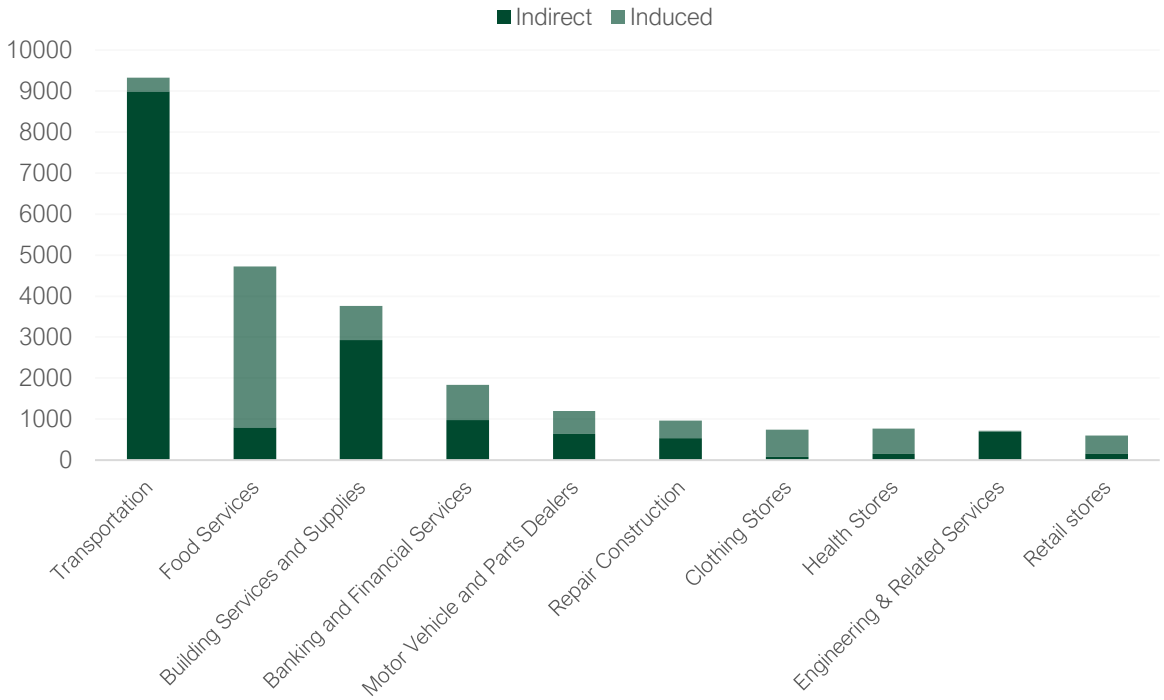
Table 6. Type I and Type II Employment Multipliers, 2022

Sector	Type I	Type II
Forestry, Logging & Support	1.6	2.0
Wood Products Manufacturing	1.5	1.9
Pulp & Paper Manufacturing	2.1	2.6
Total Forest Sector	1.6	2.0

1.4 Forest Sector Spinoff Effects

In 2022 there were 48,725 direct forestry jobs, which created an additional 51,143 indirect and induced jobs (see Table 5). In this section, the ripple or spinoff effects of forest sector activity (i.e., indirect and induced 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.

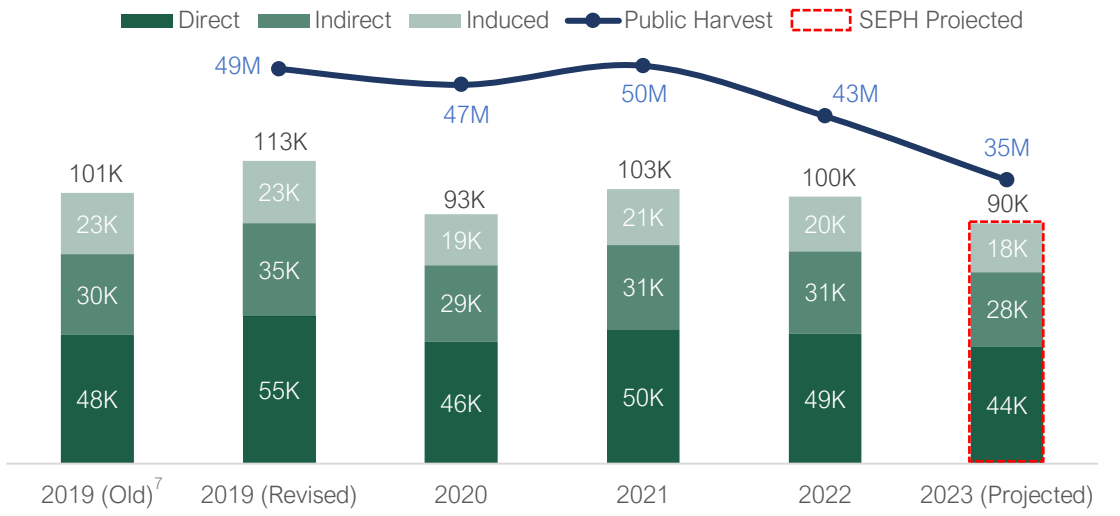
Chart 2. **The transportation and food services sectors are significantly impacted by forestry activity**



1.5 Jobs & Harvest

Total jobs in forestry are correlated with harvest levels in B.C. Since 2019, harvest levels in B.C. have declined owing to a combination of factors, including changing land-use policies, natural disturbances such as wildfires and pests, and the escalating cost of operations, among other things. This reduction in harvest levels has significant implications for the provincial economy as total economic impacts are correlated with harvest levels (Chart 3). The chart below shows the correlation between harvest levels and jobs. With a sizeable drop in harvest levels for 2023, it is expected that there will be negative economic impacts on all economic metrics, notably jobs. Utilizing data sourced from the Survey of Employment, Payrolls, and Hours (SEPH), a dataset known for its timeliness albeit reduced accuracy, it is estimated that job losses in 2023 in the forest sector could reach approximately 10,000.

Chart 3 - **Jobs and harvest levels are highly correlated**



Source: *Harvest Billing System.* Units for Public harvest in cubic meters

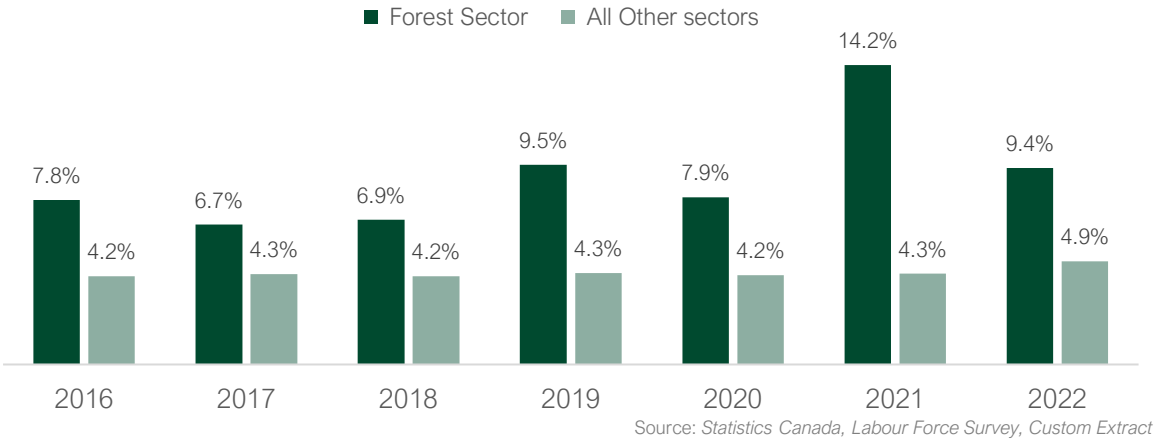
Note that in Chart 3 above, there is a revised jobs number for 2019. When COFI released its economic impact study in 2021, it provided total job estimates for 2019[7] of about 101,000 jobs. Subsequent to that period, Statistics Canada implemented substantial revisions to their data, primarily attributable to the 2021 Census and COVID-19 impacts. These revisions resulted in noteworthy upward adjustments to our 2019 estimates for total forestry-related employment to 113,000 jobs (Chart 3 – 2019 Revised).

[7] The Economic Impact of British Columbia's Forest Sector 2019 (cofi.org)

Indigenous Labour Participation[8]

Indigenous labour participation (Chart 4) in the forest sector has been trending upwards and exhibits nearly twice the representation of Indigenous employment compared to other sectors.

Chart 4 - **Forestry leads other sectors in Indigenous representation**



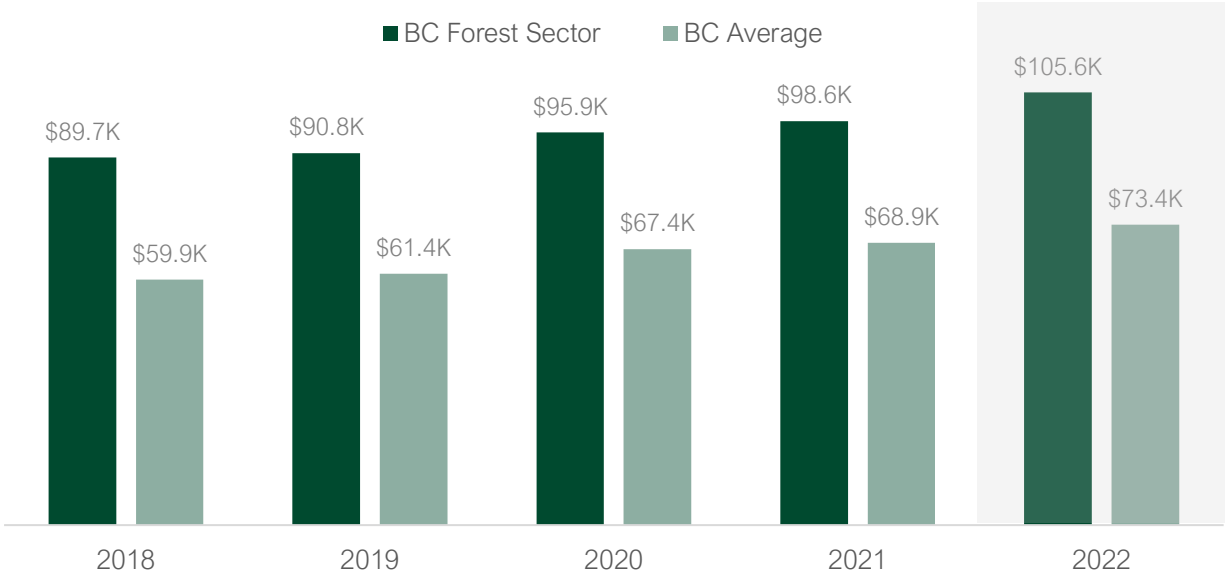
Source: *Statistics Canada, Labour Force Survey, Custom Extract*

Forest Sector Compensation

One noteworthy aspect of those working in the B.C. forest sector is that wages are nearly 45% higher than the average earnings in British Columbia. Salaries have consistently increased since 2018, rising from around $90,000 to just over $105,000 per year in 2022 (Chart 5). The significance of well-paying jobs in B.C., particularly in regional communities, cannot be understated, as they contribute to maintaining a high standard of living. In rural areas, where such jobs are scarcer compared to urban centers, the resource sector is even more crucial for the province.

[8] Includes persons who reported being an Indigenous person, that is, First Nations, Métis or Inuk (Inuit), or those who reported more than one identity. Excluded from the survey's coverage are persons living on reserves and other Indigenous settlements in the provinces as well as those living in the territories.

Chart 5 - **The B.C. Forest Sector has significantly higher-paying salaries, averaging over 105k a year in 2022**



Source: *Statistics Canada Table 36-10-0480-01*

SECTION TWO

Economic Impact by Region

2.1 B.C.'s Economic Development Regions

There are eight Economic Regions within British Columbia that are defined based on spatial aggregations of various census boundaries.[9] Economic activity in each of these is influenced by the forest sector. The regions include:

- Vancouver Island/Coast – Includes all of Vancouver Island and the Gulf Islands. It encapsulates major urban centres, such as Victoria and Nanaimo, and contains some areas 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 areas around Whistler, Pemberton, and Lillooet are also part of this region.
- Thompson/Okanagan –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 including 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 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 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.

[9] 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 2021 census. An experienced labour force provides a more robust measure that is less influenced by short-term fluctuations or seasonal variation. These labour force estimates were based on the place of work, rather than the 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 is 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 6 - **The forest industry impacts all regions of the province, with the Lower Mainland-Southwest leading in economic impact**

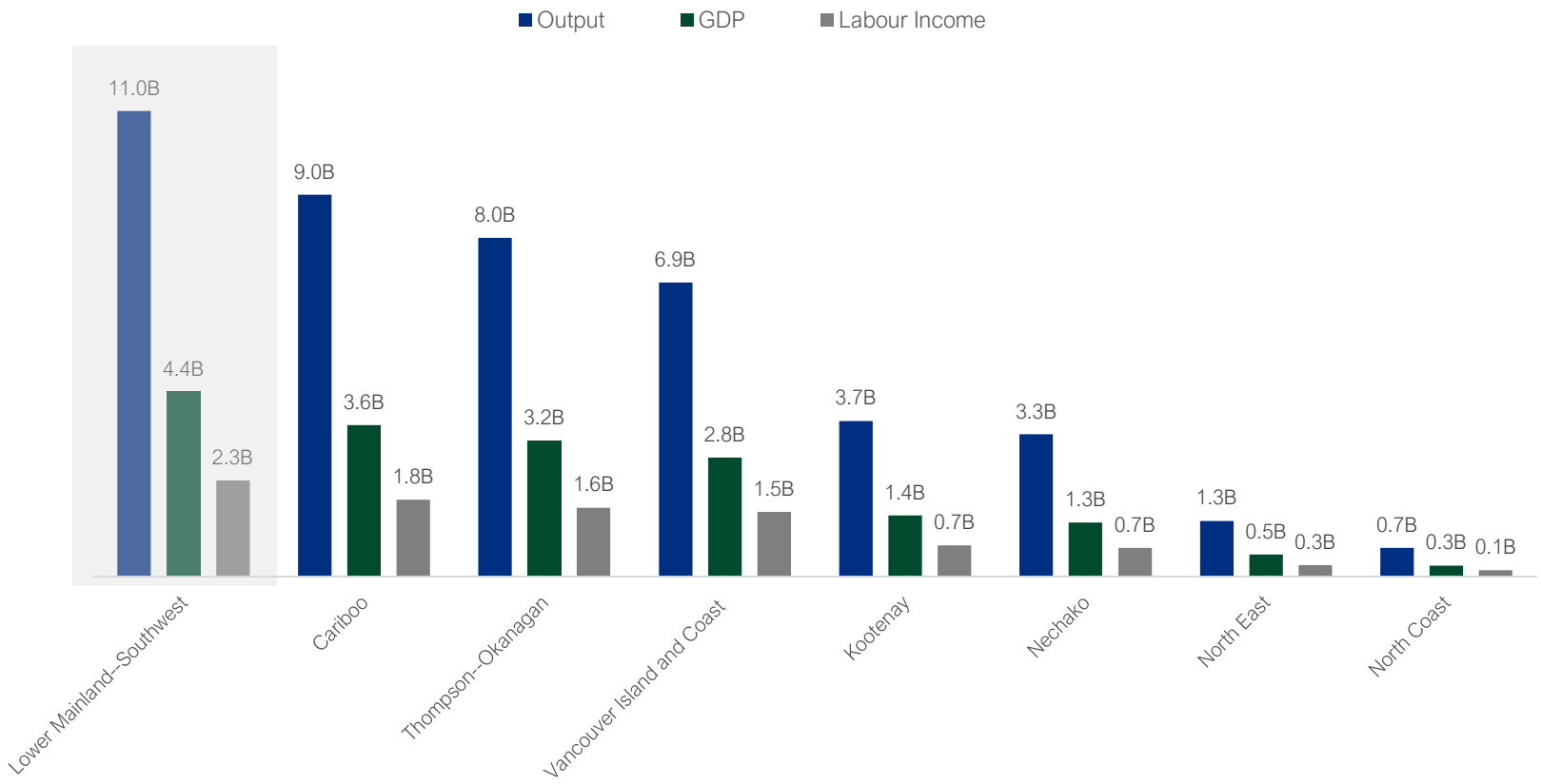


Chart 7 - Direct forestry jobs often lead to just as many indirect and induced jobs

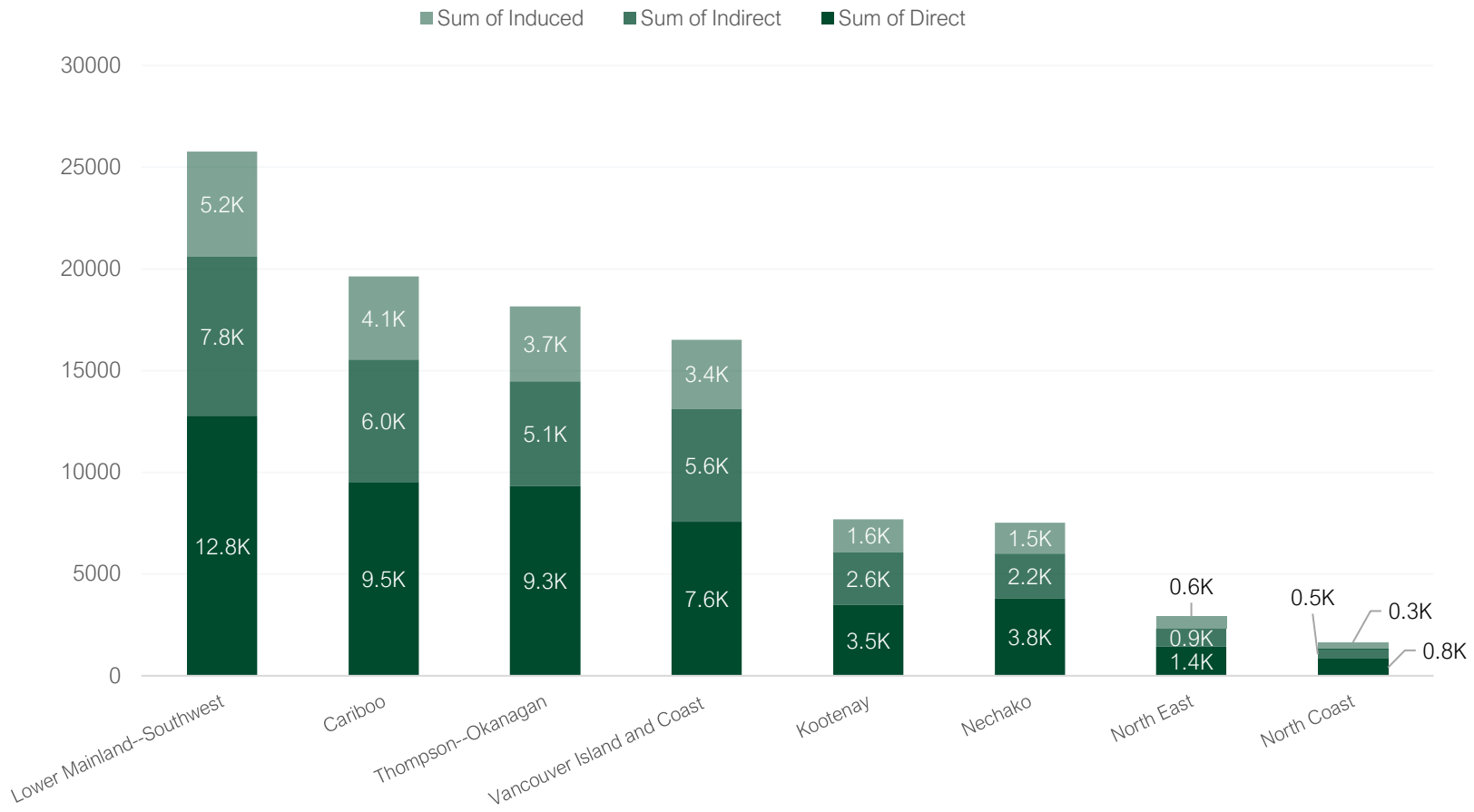
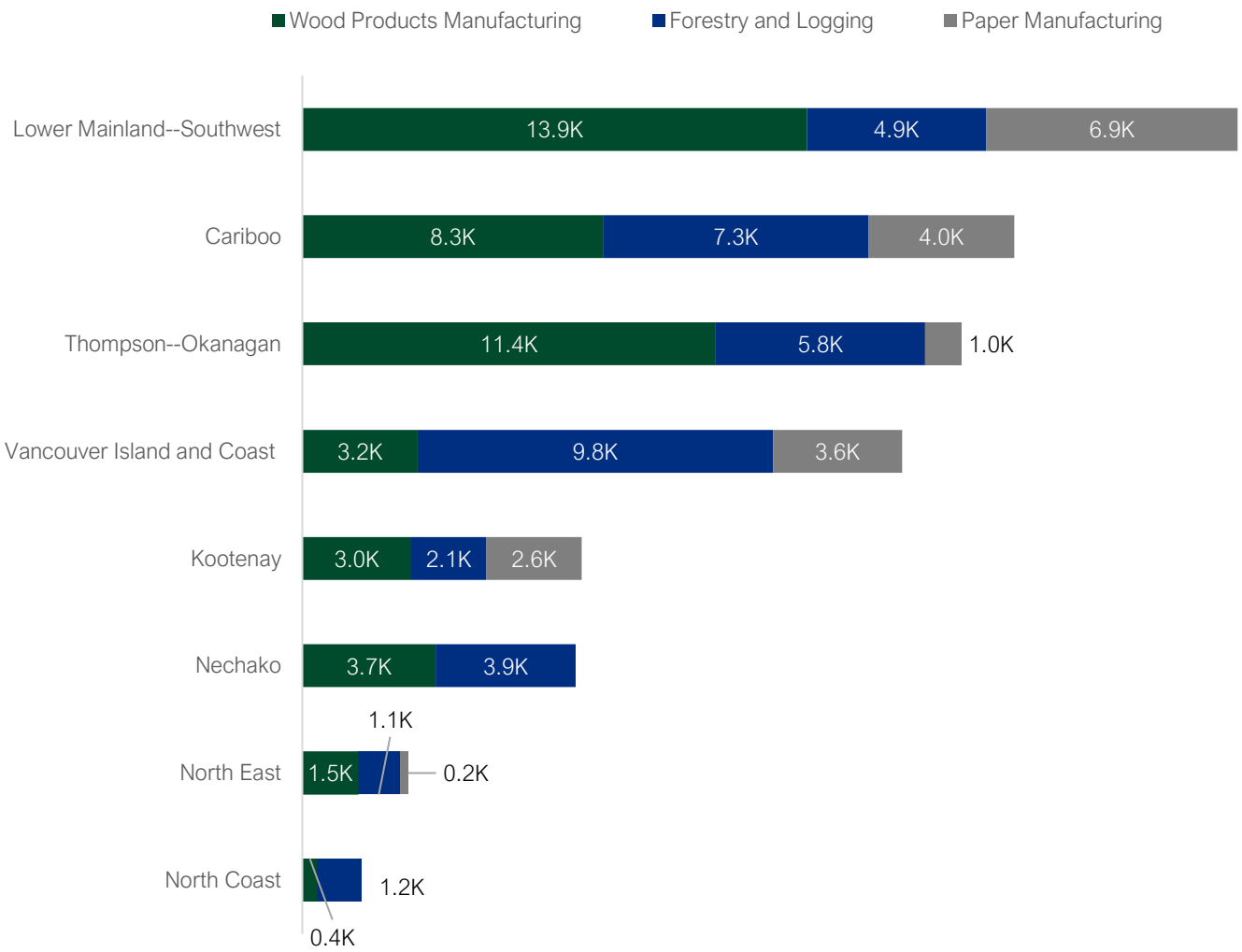


Chart 8 - **Wood products manufacturing leads in employment in most regions, whereas forestry and logging is more prominent on Vancouver Island and Coast**



SECTION THREE

Government Revenues

3.1 Tax Revenues

When economic activity (i.e., output/GDP) occurs, it generates income for those who contributed towards its creation (e.g., owners of capital, and labour). 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 related to forest sector activity. 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, such as property taxes or license fees.
- Personal Income Tax (PIT) – The PIT impacts are 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 18.4% in 2022. 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 2022, the overall federal share of PIT was 63%, whereas the provincial share was 37%.
- 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 deducted 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. Ratios between GOS and taxable income by sub-sector were established using the most recent year of available data (2019). From the same data, the effective federal and provincial CIT rates by industry were calculated. Although Table: 33-10-0006-01 has been discontinued, the calculated ratios tend to be stable, so the 2019 ratios will be retained for now. These ratios and rates were then applied to the GOS estimates for each sub-sector, in each subsequent year, to come up with an estimate of the level of CIT paid by the sector to provincial and federal governments.

3.2 Other Revenue

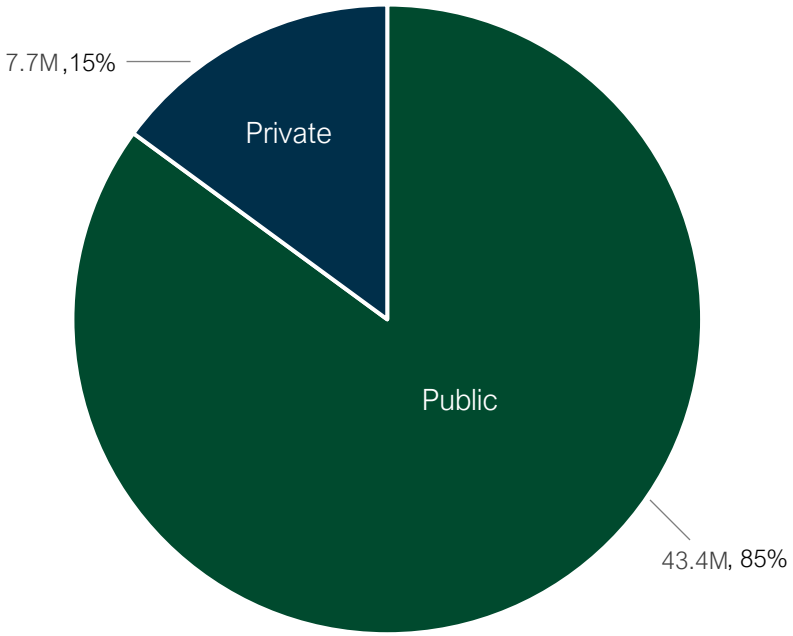
The forest sector also generates other revenue for the government through various fees. The most important ones are:

- 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 2022, 85% of the total annual harvest was from Crown or public land (Chart 9). Companies pay a fee for this standing timber, known as stumpage. Stumpage fees are set based on timber stand characteristics and market conditions, using an auction-based timber pricing system.[10]
- 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.

[10] 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.

- **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.[11]

Chart 9 - **The Majority of BC harvest is from public lands**



Source: *Harvest Billing System*

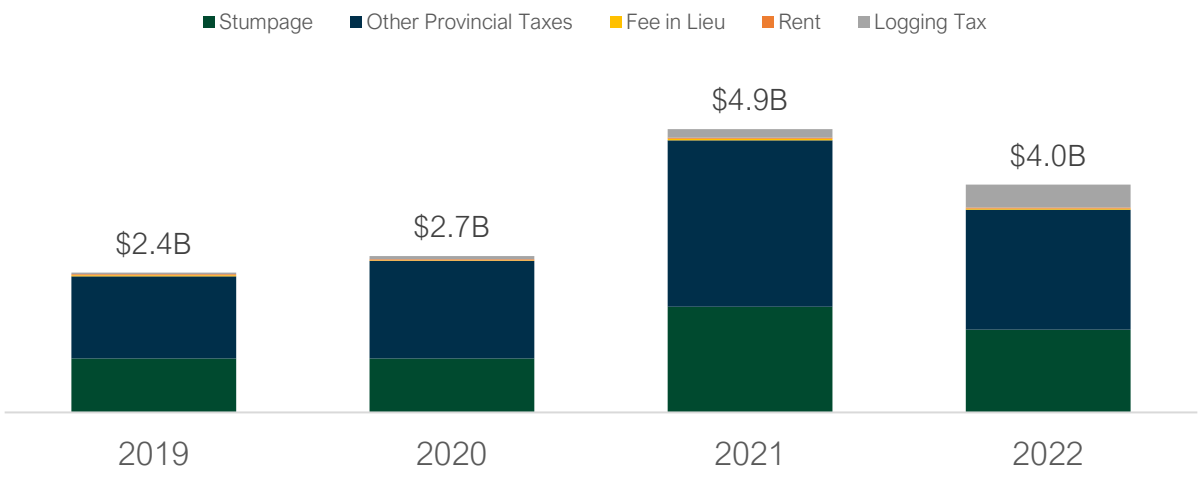
[11] See Fee in Lieu of Manufacture - Province of British Columbia (gov.bc.ca) for further details.

3.3 Government Revenue Estimates

Table 7. Total revenues collected by the provincial government attributed to the forest sector in 2022.[12]

Federal Government	$2,292 M
Products and production taxes, corporate and personal income taxes[13]	$2,292 M
Provincial Government	**$3,969 M**
Products and production taxes, corporate and personal income tax[13]	$2,086 M
Logging tax[14]	$403 M
Stumpage	$1,440 M
Annual Rent	$20 M
Fee in Lieu	$20 M
Municipal Government	**$325 M**
Products and production taxes[13]	$325 M
Total	**$6,586 M**

Chart 10 - **Stumpage is a large component of Provincial Government revenues**



*Other Provincial Taxes include direct, indirect and induced taxes from products, production, corporate and personal income taxes

[12] 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 MoF Timber Pricing Branch.

[13] Includes direct, indirect, & induced taxes.

[14] Logging tax is based on a fiscal year 2021/22.

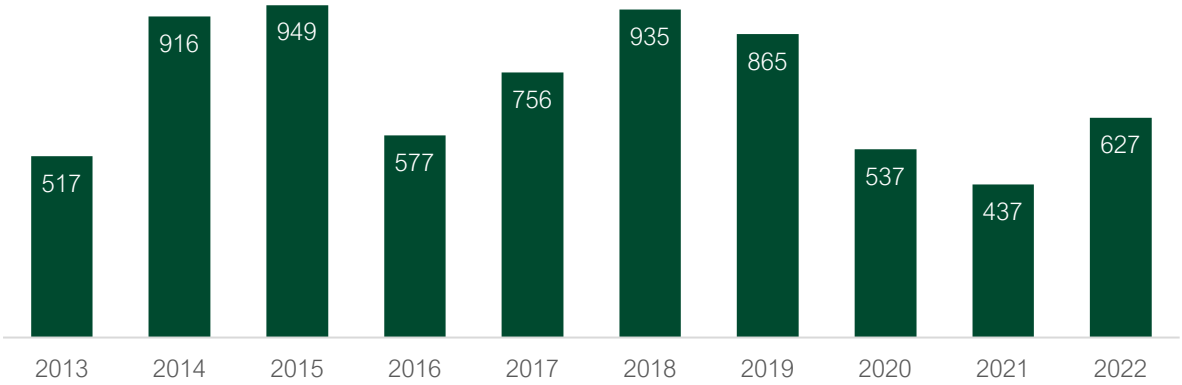
SECTION FOUR

Capital Investment

4.1 Capital Investment

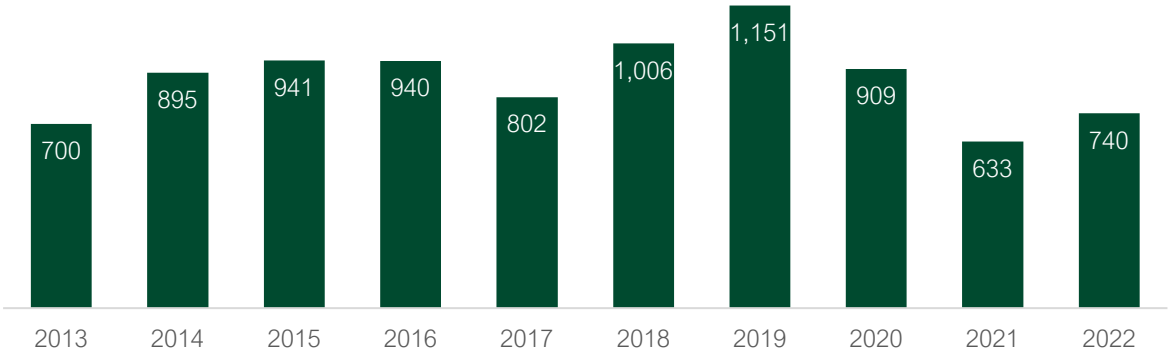
In addition to forest operations, the forest industry also contributes to the economy through its capital expenditures in the province. From 2013 to 2022, the forest sector invested approximately $15.8 billion in combined capital and repair expenditures. Capital expenditures alone, which include expenditures related to construction, machinery, and equipment, amounted to over $7.1 billion from 2013 to 2022 (Chart 11). Repair expenditures, which also include expenditures related to maintenance, amounted to $8.7 billion from 2013 to 2022 (Chart 12).

Chart 11 - **Capital Expenditures have totalled $7.1B CAD from 2013-2022**



Source: Statistics Canada. Table 34-10-0035-01. Please note that some data points have been imputed using a rolling 3-year average, in cases where Statistics Canada has suppressed the data in order to show a trend. Unless otherwise indicated, units are in Millions.

Chart 12 - **Repair expenditures have totalled $8.7B CAD from 2013-2022**



Source: Statistics Canada. Table 34-10-0035-01. Please note that some data points have been imputed using a rolling 3-year average, in cases where Statistics Canada has suppressed the data in order to show a trend. Unless otherwise indicated, units are in Millions.

Appendix

A.1 Methodology

The following section describes additional details about the methodology used in the Economic Impact Study, along with explanations of key data sources and limitations.

Economic Impact Analysis has a long history and can take many forms. The most common 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.[15]

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

- The Input-Output model assumes fixed technological coefficients. It does not consider economies of scale, technological change, externalities, or responses to price changes. This makes economic impact analysis less accurate when evaluating 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.[16]

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

[16] Getting to Know Models: - A primer and critique on Input-Output and Computable General Equilibrium Models and their uses for policy and project analysis (policyschool.ca)

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 significant change in inputs. The 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 the forest sector making purchases from itself, the intermediate consumption of forestry products (defined as products primarily produced by forestry sector industries) was zeroed out. In addition, the economic impact of the forestry sector industries appearing as indirect and induced effects were also zeroed out.

Projecting Input-Output Results from 2020 to 2022[17]

The dollar value estimates provided in the study are all based on nominal values. At the time the study was conducted, nominal GDP and output by industry in current dollars were only directly available from Statistics Canada up until the year 2020. For Forestry and Logging and the manufacturing industries, Statistics Canada suggested utilizing the principal statistics from the Annual Survey of Manufacturing and Logging (ASML) to project current dollar values for 2021 and 2022. For output, we used total revenue growth rates to make projections as follows: calculate the growth rate of total revenue in time t+1 and apply that rate to output in time t to estimate output in t+1. A similar exercise was done for projecting nominal GDP, except the growth rate in value added was applied.

For support activities related to forestry, projections were based on a GDP deflator, which was calculated as follows:

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

Since we do not have nominal GDP for 2021 and 2022, a price index was used for the sub-sector to calculate the deflators.

[17] 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)

$$Deflator_{\{t+1\}} = \frac{P_{\{t+1\}}}{P_{\{t\}}} \text{ x } Deflator_{\{t\}}$$

Then nominal GDP was forecast as:

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

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

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

For the number of jobs, a projection exercise was not necessary 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.

A. 2 Data

Economic metrics for the Vancouver Island/Coast development region, 2022 CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	2,252M	867M	475M	3,593M
	Wood Products Manufacturing	1,172M	259M	183M	1,614M
	Pulp & Paper Manufacturing	1,040M	482M	193M	1,715M
	Total	**4,464M**	**1,608M**	**850M**	**6,922M**
GDP	Forestry, Logging & Support	819M	368M	282M	1,469M
	Wood Products Manufacturing	317M	145M	128M	591M
	Pulp & Paper Manufacturing	275M	309M	156M	739M
	Total	**1,411M**	**822M**	**566M**	**2,799M**
Labour Income	Forestry, Logging & Support	512M	245M	111M	868M
	Wood Products Manufacturing	187M	68M	39M	293M
	Pulp & Paper Manufacturing	176M	137M	48M	361M
	Total	**875M**	**450M**	**197M**	**1,522M**
Employment	Forestry, Logging & Support	4,649	3,189	1,954	9,792
	Wood Products Manufacturing	1,664	847	662	3,174
	Pulp & Paper Manufacturing	1,250	1,527	785	3,562
	Total	**7,563**	**5,563**	**3,401**	**16,528**

Economic metrics for the Lower Mainland/Southwest development region, 2022 CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	1,110M	423M	248M	1,782M
	Wood Products Manufacturing	4,351M	1,057M	713M	6,121M
	Pulp & Paper Manufacturing	1,948M	760M	357M	3,065M
	Total	**7,410M**	**2,240M**	**1,318M**	**10,968M**
GDP	Forestry, Logging & Support	419M	183M	150M	751M
	Wood Products Manufacturing	1,256M	587M	495M	2,338M
	Pulp & Paper Manufacturing	534M	466M	265M	1,265M
	Total	**2,209M**	**1,235M**	**910M**	**4,354M**
Labour Income	Forestry, Logging & Support	256M	116M	55M	427M
	Wood Products Manufacturing	731M	297M	161M	1,188M
	Pulp & Paper Manufacturing	351M	218M	87M	656M
	Total	**1,338M**	**630M**	**303M**	**2,272M**
Employment	Forestry, Logging & Support	2,451	1,513	976	4,939
	Wood Products Manufacturing	7,397	3,774	2,734	13,904
	Pulp & Paper Manufacturing	2,935	2,535	1,464	6,934
	Total	**12,783**	**7,822**	**5,174**	**25,778**

Economic metrics for the Thompson/Okanagan development region, 2022 CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	1,271M	481M	299M	2,051M
	Wood Products Manufacturing	3,930M	893M	630M	5,453M
	Pulp & Paper Manufacturing	287M	131M	53M	471M
	Total	**5,487M**	**1,505M**	**983M**	**7,975M**
GDP	Forestry, Logging & Support	495M	210M	183M	888M
	Wood Products Manufacturing	1,161M	501M	442M	2,105M
	Pulp & Paper Manufacturing	76M	84M	43M	203M
	Total	**1,732M**	**795M**	**668M**	**3,195M**
Labour Income	Forestry, Logging & Support	297M	128M	64M	489M
	Wood Products Manufacturing	658M	242M	137M	1,037M
	Pulp & Paper Manufacturing	49M	37M	13M	99M
	Total	**1,004M**	**407M**	**215M**	**1,625M**
Employment	Forestry, Logging & Support	2,971	1,669	1,131	5,772
	Wood Products Manufacturing	6,017	3,034	2,343	11,394
	Pulp & Paper Manufacturing	352	417	216	986
	Total	**9,340**	**5,121**	**3,691**	**18,152**

Economic metrics for the Kootenay development region, 2022 CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	476M	183M	102M	760M
	Wood Products Manufacturing	1,203M	256M	183M	1,642M
	Pulp & Paper Manufacturing	767M	357M	142M	1,265M
	Total	**2,445M**	**796M**	**427M**	**3,668M**
GDP	Forestry, Logging & Support	174M	78M	61M	313M
	Wood Products Manufacturing	304M	144M	129M	577M
	Pulp & Paper Manufacturing	203M	229M	115M	546M
	Total	**681M**	**450M**	**304M**	**1,435M**
Labour Income	Forestry, Logging & Support	108M	51M	24M	183M
	Wood Products Manufacturing	184M	65M	37M	286M
	Pulp & Paper Manufacturing	130M	101M	35M	266M
	Total	**422M**	**217M**	**96M**	**735M**
Employment	Forestry, Logging & Support	997	668	414	2,078
	Wood Products Manufacturing	1,559	799	642	3,001
	Pulp & Paper Manufacturing	916	1,128	579	2,623
	Total	**3,472**	**2,595**	**1,635**	**7,702**

Economic metrics for the Cariboo development region, 2022 CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	1,597M	603M	383M	2,583M
	Wood Products Manufacturing	3,264M	699M	501M	4,465M
	Pulp & Paper Manufacturing	1,176M	547M	218M	1941M
	Total	**6,038M**	**1,849M**	**1,102M**	**8,989M**
GDP	Forestry, Logging & Support	629M	264M	235M	1,128M
	Wood Products Manufacturing	858M	392M	353M	1,603M
	Pulp & Paper Manufacturing	311M	351M	176M	838M
	Total	**1,798M**	**1,007M**	**764M**	**3,570M**
Labour Income	Forestry, Logging & Support	375M	159M	81M	615M
	Wood Products Manufacturing	509M	178M	103M	790M
	Pulp & Paper Manufacturing	199M	155M	54M	408M
	Total	**1,083M**	**492M**	**238M**	**1,813M**
Employment	Forestry, Logging & Support	3,806	2,072	1,428	7,306
	Wood Products Manufacturing	4,321	2,201	1,773	8,295
	Pulp & Paper Manufacturing	1,406	1,731	888	4,025
	Total	**9,533**	**6,004**	**4,089**	**19,626**

Economic metrics for the North Coast development region, 2022 CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	279M	107M	60M	446M
	Wood Products Manufacturing	164M	35M	25M	225M
	Pulp & Paper Manufacturing	0M	0M	0M	0M
	Total	**443M**	**142M**	**85M**	**671M**
GDP	Forestry, Logging & Support	103M	46M	36M	184M
	Wood Products Manufacturing	41M	20M	18M	79M
	Pulp & Paper Manufacturing	0M	0M	0M	0M
	Total	**144M**	**65M**	**54M**	**263M**
Labour Income	Forestry, Logging & Support	64M	30M	14M	107M
	Wood Products Manufacturing	25M	9M	5M	39M
	Pulp & Paper Manufacturing	0M	0M	0M	0M
	Total	**89M**	**39M**	**19M**	**147M**
Employment	Forestry, Logging & Support	590	390	243	1,223
	Wood Products Manufacturing	216	111	88	415
	Pulp & Paper Manufacturing	0	0	0	0
	Total	**806**	**500**	**332**	**1,638**

Economic metrics for the Nechako development region, 2022 CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	877M	336M	191M	1,403M
	Wood Products Manufacturing	1,418M	308M	218M	1,944M
	Pulp & Paper Manufacturing	0M	0M	0M	0M
	Total	**2,294M**	**644M**	**409M**	**3,348M**
GDP	Forestry, Logging & Support	325M	144M	115M	584M
	Wood Products Manufacturing	363M	172M	153M	688M
	Pulp & Paper Manufacturing	0M	0M	0M	0M
	Total	**688M**	**316M**	**267M**	**1,271M**
Labour Income	Forestry, Logging & Support	201M	93M	44M	338M
	Wood Products Manufacturing	219M	79M	45M	343M
	Pulp & Paper Manufacturing	0M	0M	0M	0M
	Total	**420M**	**172M**	**89M**	**681M**
Employment	Forestry, Logging & Support	1,880	1,215	766	3,862
	Wood Products Manufacturing	1,916	982	774	3,672
	Pulp & Paper Manufacturing	0	0	0	0
	Total	**3,796**	**2,197**	**1,541**	**7,534**

Economic metrics for the Northeast development region, 2022 CAD Millions (M).

	Sector	Direct	Indirect	Induced	Total Impact
Output	Forestry, Logging & Support	262M	101M	56M	418M
	Wood Products Manufacturing	571M	125M	90M	785M
	Pulp & Paper Manufacturing	68M	31M	13M	112M
	Total	**900M**	**257M**	**158M**	**1,315M**
GDP	Forestry, Logging & Support	96M	43M	33M	172M
	Wood Products Manufacturing	162M	70M	63M	295M
	Pulp & Paper Manufacturing	18M	20M	10M	48M
	Total	**276M**	**133M**	**106M**	**515M**
Labour Income	Forestry, Logging & Support	60M	28M	13M	101M
	Wood Products Manufacturing	93M	33M	19M	145M
	Pulp & Paper Manufacturing	11M	9M	3M	23M
	Total	**164M**	**70M**	**35M**	**269M**
Employment	Forestry, Logging & Support	545	369	228	1,142
	Wood Products Manufacturing	806	407	324	1,537
	Pulp & Paper Manufacturing	81	100	51	231
	Total	**1,432**	**875**	**603**	**2,910**

BC COUNCIL
OF FOREST
INDUSTRIES

www.cofi.org
𝕏 cofi_info