



Equity, diversity and inclusion in Canada's forest sector labour force: Are we making progress?

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ABSTRACT

Around the world, the labour force supporting commercial forestry has been male-dominated and Canada is no exception. Women, Indigenous Peoples and immigrants in Canada often face systemic barriers such as racism, sexism that result in specific inequalities including income disparities, job segregation, and uneven opportunities for training and mentorship. In response, federal and provincial governments, industry, and educational institutions have introduced policies and taken action to enhance equity, diversity, and inclusion (EDI) in the labour force across multiple sectors. In this paper, we explore Canada's progress in building a diverse and equitable forestry labour force. We analysed data from national forestry strategies (1981–2019), State of Canada's Forests Reports (1990–2023), and the quinquennial national Census (1991–2021), using proxies to examine progress in employment opportunities and representation of three equity-denied groups: women, Indigenous Peoples, and immigrants. Although there are high-level policies for EDI, federal government documents for the forest sector revealed little attention to EDI, with the exception of promoting opportunities for Indigenous workers. Census data show slow and uneven progress with respect to labour force participation, income, and job segregation in forestry. While there is progress in opportunities for Indigenous people, the data show that they still have lower incomes and occupy fewer management positions than others employed in commercial forestry. We reflect on several limitations in the available data and conclude that if the forest sector in Canada and other similar contexts seeks to advance EDI in its forestry labour force, it must commit to broad motivations for diversity beyond industry competitiveness, set clear targets, introduce new practices, take action and publicly report on the results.

1. Introduction

In 2015, the United Nations adopted a set of 17 Sustainable Development Goals (SDGs) underlined by the principle of “leaving no one behind” and with the goal of ensuring that the benefits of development should be shared by all. Achieving the SDGs requires addressing inequalities and discrimination and ensuring that data and evidence are collected and disaggregated to identify and address the root causes of inequalities across and within countries and sectors. The fifth goal specifically addresses gender equality, while the tenth and eighth goals take a broader perspective of reducing inequality and ensuring productive employment and decent work for all, respectively. In framing these goals, the UN explicitly recognises that achieving sustainable development will not be possible without action to address the social needs of the world's population.

In the forest sector, the pursuit of sustainable forest management remains an important management goal with a broad acceptance among governments, the private sector, and civil society since the early 1990's (CCFM, 1992; Bridge et al., 2005). Despite this, there is a widespread recognition that measures of sustainable forest management do not do a good job of tracking social goals of sustainability (Steenberg et al., 2013; Tysiachniouk and McDermott, 2016; Symington-Armstrong, 2018) and is less attentive to changing societal values and interests, including gender and diversity. This is evident in the long-standing recognition that the natural resources sector, particularly, forestry lacks labour force diversity and is less inclusive and less welcoming for women and other minority groups. In major forest producing countries of the global north such as Canada, United States, Sweden, and Finland, women, young people, and Indigenous people, among others, are poorly represented and have fewer opportunities to grow in their careers and secure

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leadership positions (see; Holmgren and Arora-Jonsson, 2015; Ville et al., 2023; Bal and Sharik, 2019; Katila et al., 2025). For instance, studies in Canada's forest industries have long shown persistent inequalities in the labour force for women and Indigenous people (e.g. Teskey and Smyth, 1975; Hopwood et al., 1993; Merkel, 1994). For example, Reed (2008), Varghese and Reed (2012) and Ekers (2014) have all pointed to the gendered character of forestry in Canada and documented institutional barriers to securing and retaining women in the forestry labour force (see also Baruah and Biskupski-Mujanovic, 2021; Reed, 2004).

In response, governments, industry, and educational institutions have taken steps to advance equity, diversity, and inclusion (EDI) using approaches such as equity hiring, development of EDI statements and policies, training, and the collection, analysis and reporting of diversity data. Since 2012, the Forest Stewardship Certification's (FSC) Global Strategy and the Forest Stewardship Standards have referenced diversity and gender equality although reporting is quite limited, and data are not available for detailed analysis (FSC, 2021). In 2021, the Government of Canada initiated a Call to Action on Anti-Racism, Equity, and Inclusion, to address systemic racism and unjust treatment of Black people, other racialized groups, and Indigenous people, and make the Public Service more inclusive (Canada, 2023). Given the commitment and variety of initiatives to enhance social sustainability, it could be expected that Canada would be well advanced in ensuring EDI in the forest sector labour force and meeting objectives for social sustainability and the development of resilient, equitable communities within the forestry sector.

This paper tracks and evaluates Canada's national progress towards a more equitable labour force and the actions required to embed and track commitments to EDI in industrial forest sector. Our objective is twofold: first, we assess the extent to which forest sector policies, strategies and reporting address workforce diversity broadly and EDI commitments specifically; second, we quantify and track the proportions of three designated groups – Indigenous people, women, and immigrants – within Canada's forestry sector labour force to assess progress towards building a more equitable workforce. In setting these objectives, we adopt an empirical approach to provide evidence on the existing situation, while also acknowledging that there are no consistent indicators or data that allow reliable measurement of EDI in a sector such as forestry across the nation. Hence, we hope that this national portrait will support the development of better indicators and a deeper understanding of EDI as a concept within the sector.

We begin by summarizing research on EDI from an early emphasis on women's disadvantages to a broader view that considers multiple interconnecting factors. We then address our objectives using two distinct approaches. Firstly, analysing national policy documents and reporting since 1981 enables us to consider the presence or absence of initiatives for and reporting on EDI, relative to other forest sector issues. Secondly, we use employment data from the quinquennial national Census to determine changing proportions and income levels of Indigenous people, women, and immigrants working in the sector. Finally, we consider the possible implications of this trajectory for attaining an equitable, diverse, and inclusive labour force that is equipped to meet the demands of an emerging knowledge-based, innovative and globally competitive forest sector nationally.

2. Background – Movement towards understanding equity, diversity, and inclusion in the natural resource sectors

Historically, employment in the natural resources sectors, including forestry, has been highly segregated, with men dominating almost all roles, except for administrative functions. Research has shown systemic challenges in attracting, recruiting, and retaining workers from equity-denied groups such as women, racialized minorities, and gender diverse individuals (Batavia et al., 2020; Burmann et al., 2022; Mejicano et al., 2022; Korhonen et al., 2024). For well over a century, membership

and leadership of natural resource and environmental organisations have been overwhelmingly dominated by upper- and middle-class white men (see Harry et al., 1969; Taylor, 2008; Schelhas, 2002). Marilyn Waring's (1988) ground-breaking work "If women counted" argued that national income accounting systems always disadvantaged the contributions of women by undervaluing or making their work invisible. Subsequent research focused on the proportion of women in paid work and also highlighted a significant "gender wage gap", where women received lower incomes than men for equally productive work (reviews include Blau and Kahn, 2017; Weichselbaumer and Winter-Ebmer, 2005). At the same time, women in forestry and natural resources fields report harassment, lower job-satisfaction, and gender-based discrimination more frequently than males in similar roles (Johansson et al., 2018; Sjölie et al., 2023). In addition, they often endure an unwelcoming atmosphere, grapple with the perception that forestry is primarily a "male" profession, struggle to feel a sense of belonging, and perceive limited career opportunities (Sjölie et al., 2023; Crandall et al., 2020; Baublyte et al., 2019; Larasatie et al., 2019).

While earlier efforts to redress the imbalance in the paid workforce focused on gender parity as a human rights concern (Taylor, 2015), over time, ideas about employment equity have broadened to account for gender, sex, and other intersecting factors. This body of research has shown that individuals with intersecting identities of race, gender, ethnicity, citizenship status, disability and sexuality, have even more pronounced challenges when working in forestry and other natural resources sectors (Collins and Bilge, 2020).

Parallel to recognition of gender inequality, the civil rights movement of the 1960s contributed to promoting diversity. In recent years, greater awareness of systemic bias and discrimination, amplified by new media, has further highlighted the experiences of people of color (Devine and Ash, 2022). Equity, Diversity and Inclusion (EDI) has become a conceptual framework to address historical underrepresentation and multiple persistent barriers to participation of equity-denied groups in all sectors of society. EDI is a multi-layered, trimodal theory with intersecting elements that is used to promote equal participation and treatment of all peoples (Martin and Olson, 2024). These more recent considerations of EDI can broaden interpretations and efforts to advance social sustainability in forestry. Bernstein et al. (2020) considered past efforts in addressing inequity and diversity in organisations, noting the evolving terminology and offering definitions.

To make a clear connection between our definitions and our use of Canadian government data sources, and to potentially align definitions with available data, we adopted definitions for EDI provided by the Government of Canada. A glossary of definitions provided by the Canadian Centre for Occupational Health and Safety (2025) explains diversity as:

">the variety of identities found within an organization, group, or society. Diversity is expressed through factors such as culture, ethnicity, religion, sex, gender, sexual orientation, age, language, education, ability, family status or socioeconomic status>".

The glossary also explains Inclusion as:

">the practice of using proactive measures to create an environment where people feel welcomed, respected, and valued, and to foster a sense of belonging and engagement>". This practice involves changing the environment by removing barriers so that each person has equal access to opportunities and resources and can achieve their full potential.

Inclusive organisations modify work practices and processes to reflect the differing needs of individuals. Equity is focused on organisations rather than the individual, stressing the absence of systematic disparities between groups that come from different social backgrounds (Chin and Chien 2006 in Bernstein et al., 2020). The Canadian Centre for Occupational Health and Safety (2025) states that the "principle of equity considers people's unique experiences and differing situations and ensuring they have access to the resources and opportunities that are necessary for them to attain just outcomes. Equity aims to eliminate disparities and proportions that are rooted in historical and contemporary injustices and

oppression>". Achieving equity often requires organisations to correct historical practices that have been discriminatory.

Although the forest sector has shown increasing attention and commitment to EDI initiatives, tracking and reporting on EDI outcomes have evolved slowly. Diversity is the most common and easy to measure as many organisations now track and report diversity data (e.g., gender, race, age etc.). For instance, since 2009, the FSC standard mandates firms to report on the "number of men and of women of people working" in certified forest management operations (FSC, 2021). Although this data is available in the public forest management reports, it is difficult to access due to lack of standardised reporting format requirements and lack of traceability of who was counted. Compared with diversity, measures and reporting on equity and inclusion have been difficult. The most common equity measure reported in the forest sector has been wage gap, especially gender wage gap (see [Forestry Commission, 2025](#)) although other industry standard measures include public disclosures focused on hiring, promotion, and retention rates of women and other minority groups. Inclusion is even more difficult to measure and track and is typically assessed and reported qualitatively by organisations using employee surveys to capture perceptions factors such as fairness, respect, and sense of belonging ([Cukier et al., 2024](#)).

Beside industry practices, academic research across various disciplines is evolving to develop standard measures for EDI to overcome gaps in conceptualizing and operationalizing EDI research and implementation. For instance, [Davy \(2023\)](#) developed three-dimensional scale to measure EDI as separate constructs. [O'Keefe et al. \(2020\)](#) proposed an organization inclusion behaviour framework composed of five themes including equal treatment from peers and supervisors; inclusion promoted at an organizational level; empowerment; uniqueness recognized and valued; and belongingness.

2.1. Equity, diversity and inclusion in Canadian forestry

Research in Canada's industrial forest sector followed a similar trajectory, first demonstrating that women held a relatively small proportion of the forestry labour force, worked in highly segregated roles, and experienced significant income disparity with men ([Reed, 2003b](#); [Reed, 2003a](#); [Ekers, 2014](#); [Baruah, 2018](#)). As forestry work became more mechanized, researchers, industry and policy actors observed the opportunity for new knowledge-based occupations and the potential for opening the sector to a more diverse labour pool ([FPAC, 2024](#); [CCFM, 2017](#); [Ensign et al., 2011](#); [Teske and Beedle, 2001](#)).

Despite these changes, the largest research emphasis has been placed on women. [Baruah and Biskupski-Mujanovic \(2021\)](#) suggested that women in the natural resources sector, including forestry, continue to experience both "sticky floors and glass ceilings" (p.21), identifying recruitment, retention and promotion, advancement, and leadership as key areas of concern. Barriers to women's employment include entry rules, division of labour, social norms and regulations, organizational cultures, childcare and family-work balance, and training and promotion opportunities ([Martz et al., 2006](#); [Ensign et al., 2011](#); [Varghese and Reed, 2012](#)). Women are less likely to hold leadership positions ([Reed, 2003b](#); [Teske and Beedle, 2001](#)), thereby limiting the opportunities for new women employees to benefit from mentoring ([Ensign et al., 2011](#)). These barriers are compounded by inadequate data on the gendered division of labour ([Reed, 2008](#)) and a lack of consistent and transparent reporting ([Peltier-Huntley, 2019](#)).

Consideration of intersecting social identities including race, indigeneity, gender and gender-diverse identities, immigration status, and differing abilities, is limited. Nonetheless, the rationale for equity has expanded to include a "business case" for equity that recognises the growing need to address challenges such as an aging labour force and a labour and skill shortage that will need to be filled by a more diverse workforce, including immigrants, Indigenous people, and women ([Huq, 2007](#); [Elis et al., 2006](#); [FPSC, 2011](#)). Hence, private companies and civil society actors in Canada's forest sector are adopting internal policies and

action plans aimed at enhancing recruitment and retaining skilled labour ([FPAC, nd](#); [FGF, nd](#); [Proulx et al., 2020](#)). Researchers have also drawn attention to the employment experiences of women, Indigenous people, and other equity-denied groups ([Reed, 2004](#); [Mills, 2012](#)). This research, however, has not led to measurable change in how government tracks progress in the sector. Although Canada is a leader in conceptualizing "sustainable forest management", including criteria relating to social and economic values (e.g., [CCFM 2006; 2007](#); [Bridge et al., 2005](#)), none of the indicators under these criteria refer to gender inequality or underrepresentation of Indigenous Peoples or visible minorities. Without systematic government or academic attention, data describing women and minority groups in the sector (especially for newer fields) remains scarce and poorly understood ([Reed, 2008](#); [Ensign et al., 2011](#)). In this context, "fair representation" is not simply equality in the number of individuals employed, but also refers to other indicators such as income, access to benefits and career opportunities, and the absence of discrimination or harassment.

Indigenous people form a young and growing population facing high unemployment rates. [Beaudoin et al. \(2022: 693\)](#) suggest that they are an "an interesting labour pool for organisations in the forestry and resource sectors". Since the 1990s, Canada has encouraged Indigenous engagement and employment in the forest sector through mechanisms such as forest tenures, training and employment schemes, and business partnerships ([Brubacher, 1998](#); [Wyatt et al., 2013](#)) but studies in Quebec found that employers were slow to recognise this potential and to modify practices and workplace cultures to support Indigenous workers ([Th  berge et al., 2019](#); [Proulx et al., 2020](#)).

Research on the participation of immigrants and recent Canadians in the forest sector labour force remains both limited and scarce. In 2016, immigrants comprised only 12 % of the forest sector labour force, compared to 25 % for all sectors ([Wyatt et al., 2021](#)). Black and Asian Canadians working as professional foresters faced significant hurdles to securing employment due to prejudice and discrimination, lack of credential recognition, and lack of Canadian experience ([Boakye-Danquah et al., 2023](#)). These findings align with broader research suggesting that immigrants, and recent Canadians with educational backgrounds from Asia, Latin America, and the Caribbean, are less likely than native-born Canadians to secure employment in regulated professions ([Girard and Smith, 2013](#)) including forestry.

Both forestry and the natural resources sector more broadly have affirmed the importance of equity and diversity, as evidenced by widespread efforts across educational, professional societies, and governmental agencies to diversify and correct historical exclusion (e.g., [Brown and Harris, 2001](#); [Davis Sr et al., 2002](#); [Taylor, 2015](#); [Bal and Sharik, 2019](#)). In 2006, the Government of Canada contributed a chapter to an international document entitled, "Time for Action: Changing the Gender Situation in Forestry" produced by the Food and Agricultural Organization of the United Nations (FAO). Canada's chapter focused primarily on women's representation in the federal Forest Service and in University Forestry Programs. Between 2018 and 2021, the federal Department of Women and Gender Equality funded a national steering committee to document and develop a national strategy to address needed changes. At about this time, Natural Resources Canada, the federal department that houses the federal Forest Service, began doing in-house research about diversity in the forestry sector. Additionally, individual provincial forestry associations also began maintaining records related to gender for those who became Registered Professional Foresters within their jurisdictions. The Forest Products Association of Canada, an industry based association, has developed and now promotes its "EDI Policy" on its website (<https://www.fpac.ca/equity-diversity-and-inclusion>). Supportive organisations such as Environmental Careers Organization, ECO, Canada (<https://www.eco.ca>) and Free to Grow in Forestry (<https://www.freetogrowinforesstry.ca>) have created a wealth of resource materials for employers and employees to catalyze progressive change in the sector.

The promotion of workforce diversity in forestry has broad

motivations including larger social shifts and political demands for equality and also from a business case, that is, to address labour shortages and enhance firm performance and competitiveness (Thomson and Gooberman-Hill, 2024). While the push to diversify forestry forms part of the broader consideration to enhance social sustainability in forestry, these efforts do not necessarily rest on shared or defined notions of what equity is, why it matters, and what its implications may be (Bernstein et al., 2020). Moreso, in forestry and natural resource fields, the social aspects are relatively understudied compared to ecological and economic concerns (Kniivilä et al., 2024).

3. Methods

Examining EDI progress in the forest sector labour force is challenging because government-collected data do not match EDI definitions, obliging us to identify simple proxies that could be found in available information. For “diversity” we chose to examine Census data describing occupations and industry sectors for the Canadian labour force. While gendered data have long been collected by the Census, relating employment to indigeneity and immigration status is more recent. To evaluate “equity”, we used Census data to determine relative proportions of men/women, Indigenous/non-Indigenous and immigrant/non-immigrant workers and to compare annual average incomes. ‘Inclusion’ considers how organisations modify practices and processes to reflect differing needs of people, and such information about individual employers nation-wide is not currently available. Instead, we used national government policies and program statements as a proxy for actions by forest sector employers to promote inclusive workplaces that meet the needs of diverse workers. The forest sector is highly regulated and national policies and programs have proved effective in promoting change in forest management practices. Hence, we focus on inclusion at a structural (macro) level rather than an individual (micro) level. This approach is informed by institutional theory (see DiMaggio and Powell, 1983) and policy diffusion (Berry and Berry, 2018), recognising the role of governments in leading from the top and encouraging employers to design and implement inclusive policies and practices.

Hence our study comprises three parts: a documentary review of the way in which EDI has been presented in national strategies for Canada’s forest sector; an equivalent review of actions and progress in annual reporting in the forest sector; and an analysis of forestry employment data from Canada’s five-yearly censuses.

Firstly, we examined all seven national forest strategies produced by the federal government between 1981 and 2019 to determine how “inclusion” and EDI in the sector were presented. While Canada’s forests are provincially managed, the federal strategies (with varying names and formats) establish a common vision to coordinate provincial governments and other partners in addressing national priorities and issues (see Young and Duinker, 1998). Strategies are generally “aspirational” documents, setting a number of broad goals or directions and explaining the importance of these, with some strategies proposing priority interventions. Some provinces and individual companies have equivalent documents, but content, structure and regularity are less consistent, and we excluded them from this study. Secondly, we reviewed the annual “State of Canada’s Forests” (SOCF) reports, prepared by the federal government, which provide both a statistical snapshot of the forest sector and short analyses of issues of particular significance. In “looking back” on the year, the statistical reports provide an easily accessible and comparable set of indicators of forest management and its economic importance, but do not include social variables or EDI. The issues chosen for analysis vary from year to year, providing an indication of how national forest authorities are viewing progress and challenges in the sector. We examined all reports since 1990.

We used NVIVO 12 (qualitative data analysis software) for a keyword search in both the strategies and reports for the terms “men”, “women”, “gender”, “worker”, “workforce”, “labour”, “labour force”, “native”,

“Aboriginal”, “Indigenous”, “First Nation” and “immigrant”, and their plurals. Accepted terms have evolved and so “native” and “Indian” as used in 1981, “Aboriginal” as used in 2008, and “First Nation” are treated as synonyms for “Indigenous” in our analysis. “Workers”, “labour”, “workforce” and “labour force” are all used in similar (but not identical) ways, and we count these to indicate the relative importance of employment issues within each strategy or report. “Labour force” has a precise definition in the Census, referring to people participating in the labour market, whether they are employed or unemployed. Older strategies were not digital and were manually searched for the same key words. We looked both for occurrences of these keywords and the context in which they were used, excluding instances where keywords appeared in names (e.g., First Nations Forestry Program or the Labour Force Survey). Table 1 summarizes key observations for each of these strategies and Fig. 1 for the SOCF reports.

Thirdly, we analysed the Canadian census from 1991 to 2021 to produce a set of indicators of EDI in the forestry sector, examining characteristics such as: proportions of women, Indigenous people and immigrants in the sector, broken down by sub-sector and occupation; average annual income; labour force activity and mobility; and professional training (a full report with detailed methodology and data set is provided by Wyatt et al., 2021). Although we do not assume that members of these three groups (women, Indigenous people, and immigrants) are always marginalized or excluded, the census does provide labour force data on these groups, and we used them as proxies. In comparison, employment data for other equity-denied groups such as “visible minorities”, differently abled, or gender-diverse are not available at the forest sector level. In this article, we describe the proportions of the three groups overall in four sub-sectors, and across specific occupations, while also analysing the gender wage gap.

Canada’s census uses standardised categories that are consistent across the country and from census to census, making it more complete and more reliable than data sets or surveys conducted by provincial governments or industry associations (which can be very useful in certain contexts). We used data tables that are publicly available from Statistics Canada for the five-yearly censuses from 1991 to 2021 (although data from the 2011 census is not as detailed as that of other years and is excluded from some analyses). We obtained data on Indigenous employment from custom tables prepared by Statistics Canada at the request of Natural Resources Canada, as this information was not available in public data tables. Data were accessed using both the web interface and the *Beyond 20/20* viewing program provided by Statistics Canada and were analysed in Excel. Canada’s forest sector is usually considered as comprising four sub-sectors in the North American Industry Classification System (NAICS, codes indicated in parentheses) - Forestry and Logging (F&L, 113), Support Activities for Forestry (SA, 1153), Wood Product Manufacturing (WP, 321, including sawmills and engineered wood), and Paper Manufacturing (PM, 322, including pulp and paperboard). We recognise the growing significance of other forest-related activities, such as biofuels, carbon accounting, and recreation, but these are not included in our analysis. Data on specific occupations are presented using the National Occupation Classification (NOC), adjusting for modifications in these classifications since 1991. While data on some indicators have been available since 1991, others date only from 2006 or 2016.

4. Results

4.1. EDI in the national forest strategies

Canada’s first national forest strategy was produced in 1981, with subsequent versions being released at intervals of 5 to 11 years through to the seventh (current) strategy in 2019. Although the format varies, each strategy identifies themes (also described as directions or priorities) of current importance in the sector, ranging from two themes in 2008 to nine in 1992 and 1998. EDI has not been a theme in any of the

Table 1
EDI in Canadian forest strategies from 1981 to 2019.

Year	Strategy title (reference)	Proxies			
		Worker	Women	Indigenous	Immigrant
1981	A forest sector strategy for Canada (Roberts, 1981). Priority themes- expanding timber supply to meet internal demand and man-power crisis in professional labour	19	0	7	0
1987	A National Forest Sector Strategy for Canada (CCFM, 1987). Priority themes- trade and investment, forest management, employment, research and development and public awareness.	8	0	0	0
1992	Sustainable Forests: A Canadian Commitment (CCFM, 1992). Priority themes- sustainable forest management, effective public participation, workforce education and safety and Aboriginal peoples in forestry.	2	0	44	0
1998	National Forest Strategy 1998–2003 Sustainable forests; A Canadian commitment (CCFM, 1998). Priority themes- multiple values of forest ecosystems, management and stewardship, global competitiveness, communities and workforce including relationships with Aboriginal peoples	25	0	65	0
2003	National Forest Strategy 2003–2008 A sustainable forest; The Canadian commitment (NFSC, 2003). Priority themes- Ecosystem based management, sustainable forest communities, diversification of forest products, and urban forest and public engagement	1	2	45	0
2008	A Vision for Canada's Forests: 2008 and Beyond (CCFM, 2008). Priority themes - Forest sector transformation to sustainable forest, address climate change and wildfires, collaboration with Indigenous peoples and Canada's environment reputation	2	0	16	0
2019	A Shared Vision for Canada's Forests: Towards 2030 (CCFM, 2019)	0	0	17	0

strategies, although labour force issues were highlighted in the first four strategies, and Indigenous Peoples were themes in 1992, 1998, 2003 and 2019. Table 1 summarizes the frequency of key words for each of our proxies (women, Indigenous, and immigrants) in each of the strategies. Interestingly, the word “gender” does not appear in any of the seven strategies.

In the last forty years, “women” were mentioned in only the 2003 strategy, where women’s increasing participation was mentioned twice (along with youth and “Aboriginal Peoples”) in community and public participation activities. Workers were only mentioned once in the 2003 strategy, although the strategy refers to “forest-based communities” (9 mentions) which may be considered as including those who work in the forest sector, without distinguishing their concerns.

Indigenous people were mentioned in every strategy except in 1987, with employment in the forest sector as a recurrent theme. In 1981, forestry was viewed as a means to expand employment “for native people located on ‘Indian reserves’” (Roberts, 1981: 20). After absence in 1987, “Aboriginal Peoples” was a key theme in the 1992, 1998 and 2003 strategies, referring to the employment and economic benefits of the forest sector for Indigenous Peoples and to recognition of traditional values, land, and roles in forest management planning. The 2003 strategy specifically mentions “employment”, “training”, “business development” and “partnership” opportunities for “Aboriginal Peoples” alongside the inclusion of “Aboriginal cultural and traditional approaches” in forest decision-making (NFSC, 2003: 15). The 2008 and 2019 strategies were shorter documents (15 and 16 pages, compared to 47 in 1998) with fewer mentions of “Aboriginal”, mainly in the context of collaboration in forest business and in forest management. The 1981 and 2019 strategies were the only ones to include quantitative indicators about any of our proxies: with 6000 Indigenous employees reported (about 2 % of all workers) in 1981 and 6 % of all workers (about 14,000 Indigenous employees) in 2016.

No strategies ever referred to immigrants or non-permanent residents, even though all addressed labour issues, with 1981 identifying the “manpower crisis” as one of four major issues (Roberts, 1981: 4). While immigrants make an increasing contribution to the forest sector (as shown in section 4.3), they remain invisible in the national forest strategy.

The strategies show different approaches to promoting actions, with general recommendations in 1981 and seven specific employment recommendations in 1987 making no mention of any of our EDI proxies. A skilled labour force was one of seven priority areas in 1992, with six actions (similar to those in 1987) that did not mention our proxies. However, Indigenous perspectives were also a priority with four actions related to economic opportunities. A similar pattern is seen in 1998 with nine work related actions (one of which refers to opportunities for

Indigenous people) and three other actions for employment and business development for Indigenous people. The 2003 strategy saw a smaller number of actions (47 compared to 121 in 1998) of which none addressed workers overall, although actions included promoting innovation among managers and researchers. The 2008 strategy presented 14 “desired outcomes”, and the 2019 strategy offered five priorities and six objectives, but none of these referred to workers in the sector.

The seven strategies were silent about workforce strategies that accounted for gender and immigration status, identifying no specific issues and proposing no specific objectives or actions. By contrast, issues and actions for Indigenous Peoples have been addressed in all strategies except 1987, initially as workers, then as participants in planning and decision-making, and most recently as business-owners and partners. As a proxy for “inclusion”, the national forest strategies show that the forest sector is evolving to enhance opportunities for Indigenous Peoples, but there is no evidence of similar changes for women or immigrants.

4.2. EDI progress through annual reports

While the national strategies present a forward-looking perspective of Canada’s forest sector, the “State of Canada’s Forests” (SOCF) reports provide an annual retrospective of progress since 1990. Each report includes short sections on themes of current importance along with a standard set of quantitative indicators. Fig. 1 illustrates the number of mentions of Indigenous people and women across 34 reports. Consistent with the strategies, Indigenous people are mentioned much more frequently than women and immigrants (1,343, 104 and nine mentions respectively). The 2020 report was the first to provide data on proportions of Indigenous people, women, and immigrants in the labour force, with similar analyses in 2022, and 2023. All reports except 2012 refer to workers or labour force issues, with common themes being training, skills and technology. Of a total of 325 mentions, nearly half occur in just six years, most commonly in 2006 and 2007 with mill closures due to an economic recession.

Indigenous people have been mentioned in all SOCF reports, beginning in 1990 with a single mention that “native peoples used the forests to meet their needs” (NRCanada, 1990: 18). The number of mentions varies with six reports having five or less mentions and four reports with 100 or more. Only three reports (1997, 1999 and 2020) included sections addressing Indigenous issues, with the 1997 report containing 210 mentions (more than any other report), referring notably to Indigenous rights, roles in forest management, and traditional ecological knowledge. Perhaps surprisingly, this report made only six mentions of Indigenous employment or businesses, a central theme in both preceding and subsequent years. Indigenous engagement in federal programs such as Model Forests and the First Nations Forestry Program was

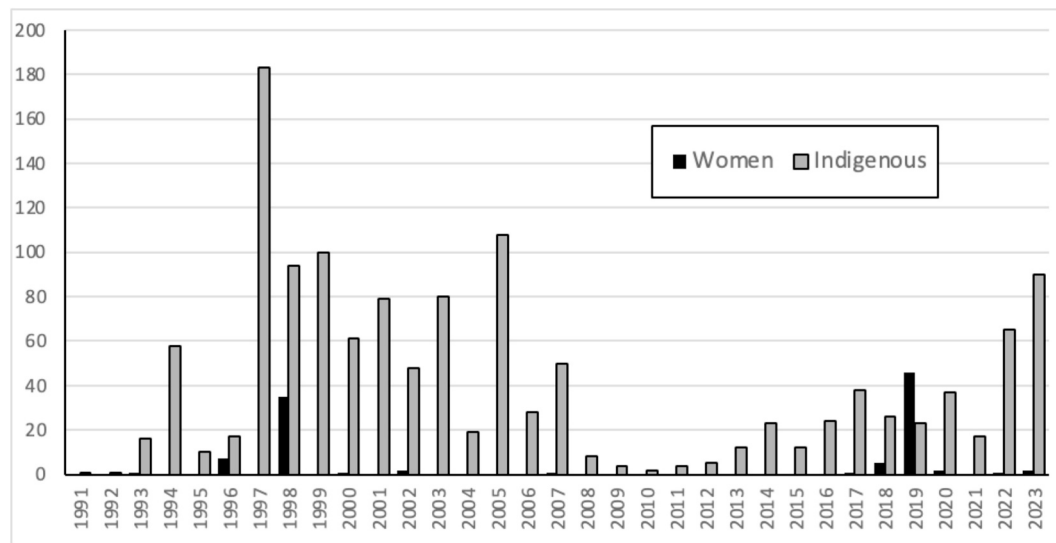


Fig. 1. Number of times “women” and “indigenous”, and their synonyms, were mentioned in each “State of Canada’s Forest” report between 1991 and 2023. Immigrants were mentioned in 1994, 2020, 2022 and 2023.

regularly reported over the following years. Quantitative data are rare until 1919: the 1999 report notes “there are only 16 Aboriginal registered professional foresters in Canada, and fewer than 100 registered forest technicians” (NRCanada, 1999: 69); the 2001 and 2002 reports provide the number of Indigenous workers receiving training through federal programs (4800 and 5700 respectively). After 2018, reports state that Indigenous employees comprised 6–7 % of the sector labour force. While Indigenous employment and economic development were dominant in early reports, discussion about Indigenous values, knowledge and participation became more common from 1997, although the context remained one where forests were managed by governments and non-Indigenous companies. There were no mentions of Indigenous women in an employment context, although there were occasional mentions in relation to their participation in planning.

Women were mentioned 99 times in the reports, of which 81 occurrences were in the years 1998 and 2019, in special sections on women in forestry. A single mention in 1993 was followed three years later by a section on international forestry, stating that Canada “requires that gender issues be considered an integral part of forest projects and that each project involve men and women equitably” (NRCanada, 1996: 40). While this requirement was imposed on international projects, there was no evidence of similar expectations in domestic forestry. The 1998 report introduced the special section on women by stating that the early days of forestry provided “no place for a woman” and that currently “females make up only 5–8% of foresters” before going on to describe the careers of six women who had “earned a place in the male-dominated field of forestry” (NRCanada, 1998: 74). Despite this recognition, women were almost invisible over the next twenty years: female insects and animals were mentioned seven times in the period 1999–2001 while women were mentioned only once. Two mentions in the 2002 report referred to women’s values, education, and the benefits provided by non-timber forest products. In 2019, another profile of six women in forestry included Tanya Wick, then vice-president of a major forestry company, who advocated for greater career development opportunities for women (NRCanada, 2019: 15).

Immigrants were mentioned in the 1994 report, stating that in the early 20th century European immigrants with farming backgrounds viewed Canada’s forests as hostile and undesirable, seeking instead to clear the land for settlement. The next mention is twenty-six years later, when the 2020 report noted that immigrants represented 12 % of the forest sector labour force, but 25 % for all sectors (NRCanada, 2020: 55). We also looked for references to minorities and disabled persons, finding

that these groups were even less visible. The 1995 report described a forestry education program for disabled children and there were single mentions of “minority” in 1998 and 2019.

This analysis of the annual SOFC reports is consistent with the findings from the strategies. All reports refer to Indigenous Peoples and there is a clear evolution in context from employment to knowledge and participation in forest management, and business roles. However, the number of mentions is highly variable and content in one report is rarely linked to the preceding year. Women were more visible in the reports than in the strategies, but this visibility is sporadic, while the contribution of immigrants to Canada’s forest sector is ignored until 2020. Finally, we note that while every report provided the number of employees in the sector, nationally and for each province, it is not until 2020 that proportions of women, Indigenous people and immigrants are included.

4.3. Quantitative data on EDI in Canada’s forestry labour force

As the preceding sections have shown, policies and reports contain diverse, but inconsistent, references to the participation of women, Indigenous Peoples and immigrants in Canada’s forest sector, with the second group being most common. We sought to determine the effect of statements in these documents by exploring how the national agency, Statistics Canada, has reported employment patterns over time. Here we focus on several indicators between 1996 and 2021 to document the extent of participation of our three target groups in the labour force, their relative proportions in the most common occupations within the forest sector, and the gender wage gap.

4.3.1. Women’s participation in the forest sector labour force

Fig. 2 shows the overall proportion of women in the forest sector, showing a slow but steady increase from 14 % in 1996 to 19 % in 2021, despite a range of policy and program initiatives dedicated to promoting gender equality during this period. Breaking this down by provinces shows that Ontario has the highest proportion with women comprising 23 % of the forest labour force in 2021 compared to only 14 % in New Brunswick.

Separating the data by sub-sectors and examining both the proportion and number of women (Fig. 3) provides a more nuanced understanding. Support Activities for Forestry (SA) (with occupations ranging from professional foresters to seasonal tree planters) shows the highest proportion of women. This remained stable at 21–22 % from 1996 to

2016 but jumped to 29 % in 2021. The other three sub-sectors showed steady increases with paper manufacturing consistently outperforming the others. The Forestry and Logging (F&L) sub-sector was more volatile, which may reflect both cycles in timber markets and an employment model dominated by small contractors.

It is important to note that total employment in the forest sector fell by 48 % from 369,480 in 1996 to 193,760 in 2021. This trend is reflected in the numbers of women shown in Fig. 3, but it is important to note that each sub-sector behaved differently. The decline has been relatively steady in Paper Manufacturing (PM) while the other sectors saw a sharp drop from 2006 to 2011 corresponding with an economic crisis that especially impacted housing construction, followed by a slight increase. Despite the overall fall in employment across the forest sector, the proportion of women increased, suggesting that they were less affected by this trend than were men. From 2016 to 2021, the number of workers fell in three sub-sectors, but the number of women increased in two of these (WP and PM). Total employment rose in the SA subsector, with women accounting for two-thirds of the increase in job numbers (2175 out of 3410).

4.3.2. Indigenous people and immigrants in the forest sector labour force

Fig. 4 shows the labour force for the forest sector and each of the four sub-sectors in 2016 and 2021, indicating the proportion of Indigenous people. This proportion remained constant at 7 % in both 2016 and 2021, but the number of Indigenous workers fell from 14,230 to 12,885, in line with the overall reduction in the sector. While this percentage is higher than their proportion in the national population (4.9 %), it is important to note that the Indigenous population in forested regions is often higher, suggesting that Indigenous people may still be underrepresented. Furthermore, the young and growing Indigenous population suggests that they will be increasingly important in the general labour force in these areas. This is reflected by the distribution of the Indigenous labour force across the sub-sectors as shown in Fig. 4. F&L and SA are typically associated with the forest and had the highest levels of Indigenous workers, while WP and PM are more likely to occur in regional cities and towns and had lower proportions. Across the provinces, the proportion of Indigenous people in forest sector occupations in 2016 varied from a high of 25 % in Saskatchewan to a low of 3 % in Quebec and New Brunswick, with no change in this situation in 2021.

In contrast to the situation for Indigenous people, the proportion of immigrants and non-permanent residents in the forest sector increased, rising from 11 % in 2006 to 12 % in 2016 and 13 % (23,560) in 2021. Nevertheless, this remains lower than their proportion in the national labour force, which was 29 % in 2021. The proportions of immigrants and non-permanent residents were higher in manufacturing (19 % for PM and 15 % for WP) in 2021, than in the forest (5 % for F&L and 7 % for SA), as shown in Fig. 5. However, the actual number of immigrants and non-permanent residents rose in both SA and PM between 2016 and 2021. The number of non-permanent residents in the sector more than doubled from 990 in 2016 to 2480 in 2021, with the Wood Product manufacturing (WP) sub-sector being especially important.

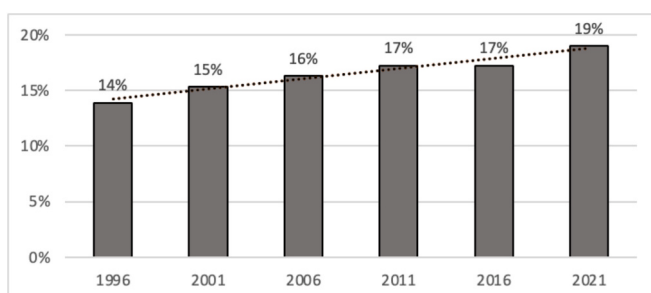


Fig. 2. Percentage of women in the forest sector labour force, 1996–2021.

4.3.3. Most common occupations in the forest sector labour force

Table 2 shows the top twenty occupations in the forest sector in 2021 showing the proportions of women, Indigenous people, and immigrants in each occupation. These top twenty jobs cover 52 % of the sector labour force and most are labourers and equipment operators. Men outnumbered women in all jobs, although two forest-based roles show the highest proportions - forest labourers (33 %) and forestry technicians (20 %). Women were much less common as forest equipment operators, with proportions in the single digits. Indigenous people, who counted for only 7 % of the forest labour force, held a higher proportion than this in 12 different occupations, almost all of which are in forest-based roles (F&L and SA sub-sectors). Proportions of immigrants and non-permanent residents were lower than the national average (29 %) in all jobs. In particular, the proportion of immigrants as labourers is lower than that for women, while they occupied more positions as managers and in skilled roles, usually in manufacturing (SM and PM sub-sectors).

Table 2 unavoidably focuses on those occupations where there are high numbers of non-immigrant, non-Indigenous men as they outnumber women, Indigenous people, and immigrants in the forest sector. Table 3 provides a different perspective, showing the top ten jobs for each of women, Indigenous people, and immigrants in 2021. Across all three groups, the most common occupation was that of labourer in processing, which was also the most common job in the sector. However, the distribution of the other most common jobs shows clear differences for each of these three groups. For women, finance and administration jobs predominated, usually with lower levels of responsibility, and men typically occupied less than 20 % of these posts. In total, 13,390 women, or 39 % of all women working in the sector, held one of the ten jobs listed whereas only 9935 women (27 %) were included in the overall top twenty list. Eight of the top ten jobs for Indigenous people were as labourers or operators in the forestry and logging sub-sector, with the highest proportions being in four harvesting roles. This top ten list accounted for 6180 workers, or 48 % of all jobs held by Indigenous people in the sector and it is important to note that this does not include any administration or management roles. For immigrants and non-permanent residents, all top ten jobs were associated with the manufacturing sub-sectors, with just over half these jobs being in skilled trades and as operators.

The top twenty and top ten job lists were dominated by the skilled trades and operator categories and by labourers. Three management roles were to be found in the top twenty list – manufacturing managers, forestry technicians and professional foresters – each of which had a relatively high proportion of women (15 %, 20 % and 18 % respectively). Immigrants and non-permanent residents occupied 16 % of the manufacturing manager positions, while there were fewer professional foresters and even fewer technicians. This percentage is lower than proportions of other skilled manufacturing operators, suggesting that immigrants face challenges in being promoted to management roles. Finally, Indigenous people are rarely found in senior positions, counting for only 2 % of manufacturing managers, 4 % of professional foresters, and only 9 % of forest technicians, despite the importance of the forest-based sub-sectors for them.

4.3.4. The persistent gender wage gap in the forest sector labour force

While the gender wage gap is generally decreasing in Canada (Fortin, 2019), there continues to be anecdotal evidence that women in the forest sector have lower incomes than men. There are many factors that can cause differences in income, including occupation types, educational qualifications, years of experience, choices about new positions, number of hours worked, and pauses in work history (Blau and Kahn, 2017). In earlier work (Wyatt et al., 2021), we analysed income differences for women, Indigenous people, and immigrants from several different perspectives (by sub-sectors, for the most common jobs, for six specific jobs since 1990, and in relation to roles and responsibilities). These indicators demonstrate a significant and persistent wage gap between men and women in the forest sector.

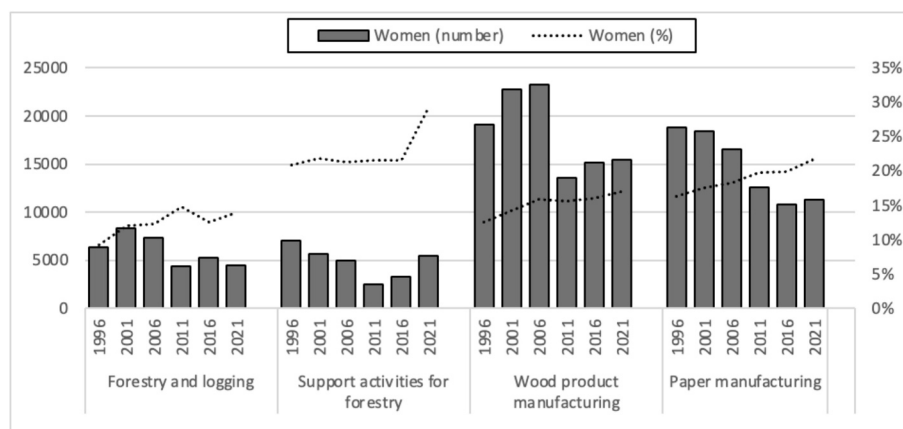


Fig. 3. Women in the forest labour force by sub-sector, 1996–2021.

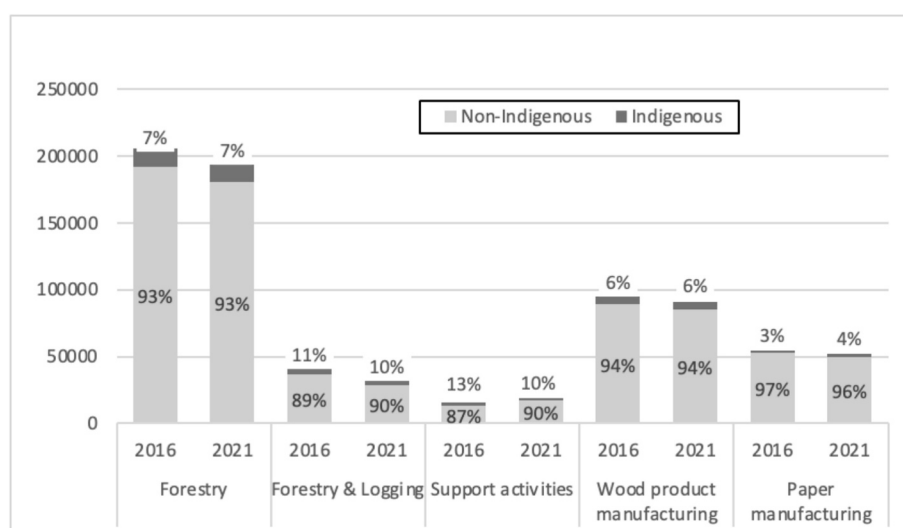


Fig. 4. Indigenous people in the forest labour force by sub-sector, 2016–2021.

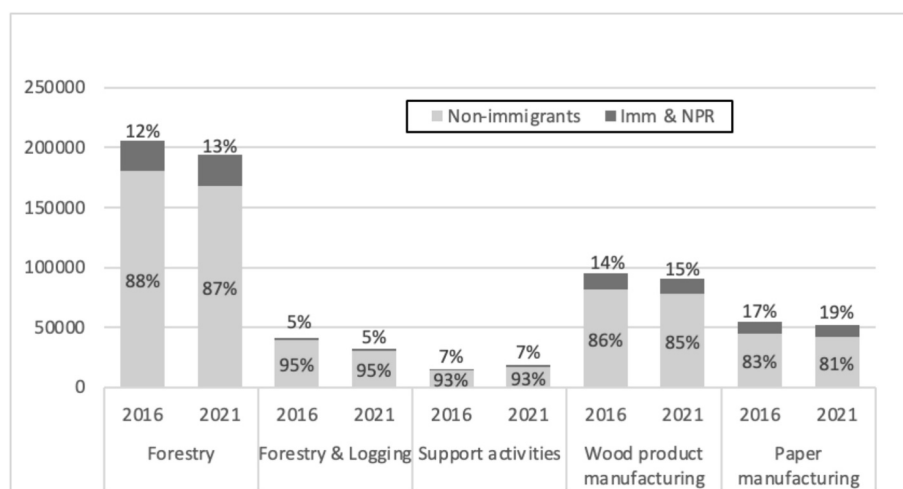


Fig. 5. Immigrants and non-permanent residents in the forest labour force by sub-sector, 2016–2021.

Fig. 6 shows average annual income for men and women in six specific occupations from 1990 to 2020. Historical data specific to income in the forest sector were not available, and so we selected

occupations that are almost exclusively found in the sector. These six occupations cover all four sub-sectors; a variety of labourer, skilled and professional posts, and all are included in the top twenty jobs for

Table 2

Twenty occupations with highest labour force in forest sector in 2021 Census.

NOC Code	Occupation	Occupation in forest sector		Groups as % of occupation		
		Workers	%	Women	Indigen.	Immig
	Total forest sector labour force	193,755	100	19 %	7 %	12 %
95103	Labourers in wood, pulp, paper process.	14,035	7 %	15 %	9 %	15 %
75101	Material handlers	9565	5 %	9 %	7 %	16 %
72400	Millwrights & industrial mechanics	7310	4 %	1 %	8 %	9 %
90010	Manufacturing managers	5990	3 %	15 %	2 %	16 %
83110	Logging machinery operators	5685	3 %	2 %	10 %	3 %
73300	Transport truck drivers	5490	3 %	2 %	9 %	8 %
94120	Sawmill machine operators	5035	3 %	6 %	8 %	12 %
84110	Chain saw and skidder operators	4995	3 %	2 %	14 %	4 %
85120	Logging and forestry labourers	4510	2 %	33 %	9 %	7 %
94121	Pulp & paper machine operators	4395	2 %	7 %	6 %	7 %
94211	Wood products assemblers & inspectors	4370	2 %	8 %	5 %	23 %
92014	Supervisors - forest products processing	4240	2 %	8%	7 %	10 %
84111	Silviculture and forestry workers	3905	2 %	12 %	15 %	10 %
92100	Power engineers and systems operators	3855	2 %	4 %	9 %	8 %
22112	Forestry technologists and technicians	3555	2 %	20 %	9 %	5 %
73400	Heavy equipment operators	3540	2 %	4 %	12 %	3 %
82010	Supervisors - logging and forestry	2805	1 %	9 %	9 %	5 %
94124	Woodworking machine operators	2720	1 %	13 %	3 %	16 %
94122	Paper converting machine operators	2675	1 %	14 %	4 %	22 %
21111	Forestry professionals	2660	1 %	18 %	4 %	9 %

Bold values are above the sector average for the group. *Values in italics* are half, or lower, of the sector average for the group.

Table 3

–Ten occupations with highest labour force for each of women, Indigenous people, and immigrants in forest sector in 2021 Census.

Women			Indigenous people			Immigrants and non-permanent residents		
Occupation	Workers	%	Occupation	Workers	%	Occupation	Workers	%
Labourers in wood, pulp, paper	2100	15 %	Labourers in wood, pulp, paper	1305	9 %	Labourers in wood, pulp, paper	2105	15 %
Administrative assistants	1695	95 %	Material handlers	715	7 %	Labourers in processing & manuf.	1850	34 %
Labourers in processing & manuf.	1550	29 %	Chain saw and skidder operators	680	14 %	Material handlers	1505	16 %
Accounting and related clerks	1530	88 %	Silviculture and forestry workers	605	15 %	Assemblers & inspectors of wood	1000	23 %
Logging and forestry labourers	1495	33 %	Logging machinery operators	590	10 %	Manufacturing managers	960	16 %
Administrative officers	1245	86 %	Millwrights and mechanics	575	8 %	Millwrights and mechanics	625	9 %
Accounting tech. & bookkeepers	1080	91 %	Transport truck drivers	490	9 %	Paper machine operators	600	22 %
General office support workers	940	81 %	Sawmill machine operators	420	8 %	Sawmill machine operators	580	12 %
Manufacturing managers	890	15 %	Heavy equipment operators	410	12 %	Process and machine operators	580	39 %
Customer service representatives	865	74 %	Logging and forestry labourers	390	9 %	Carpenters	560	25 %
Total	13,390	39 %	Total	6180	48 %	Total	10,365	37 %

women. In doing so, we sought to minimize the impact of factors that can contribute to differences in annual income (mentioned above). In 2020, 5520 women worked in one of these six jobs, (15 % of all women in the sector). Women's income was lower than men's in all six occupation and so Fig. 6 uses a stacked bar chart to show women's income plus the gap between that and men's income.

The average employment income for women in these five occupations has increased over the years, but progress has been uneven, and the wage gap persists. Logging and forestry labourers have the lowest income and are often part-time or seasonal. Women's average income was only 48 % of that of men in 1990, climbing to 68 % in 2020. Forestry professionals are the best paid group, and women came close to parity with men at 91 % in 2015 (along with assemblers and inspectors), but then saw their income decline in 2020 while that of men increased. The wage gap for labourers in wood, pulp and paper processing – the most common job in the forest sector – has narrowed. In 1990, women received 65 % of men's income, while this increased to 80 % in 2015. Forestry technologists and technicians have seen the greatest improvement, from 60 % in 1990 to 84 % in 2020. The worst performance is among paper converting machine operators, where women received 65 % of men's income in 1990, rising to 75 % in 2015 and falling back to 65 % in 2020 – despite a steady improvement in average annual income.

Finally, it is useful to consider changes in Canada's annual average consumer price index¹ which rose by 75 % over this thirty-year period. Increases in women's average income exceeded this percentage for all six jobs examined here, but only men who were paper converting machine operators or forestry professionals saw their real income increase over the period.

5. Discussion

5.1. Progress is slow and uneven

Our data sources reveal slow, limited, and uneven progress in EDI over time, suggesting the continued relevance of past results and the persistence of inequities in forest sector labour force (Reed, 2008; Baruah and Biskupski-Mujanovic, 2021). Progress in the proportion of jobs held by women has been almost glacial in pace. Nevertheless, the numbers are rising, and the wage gap is shrinking in some sub-sectors as women's salaries are rising relative to men's. Studies of the gender wage gap show that the rarity of women in higher paid jobs is an important factor when considering wage inequality in a sector (Blau and Kahn, 2017), but our data on individual occupations provides a more nuanced perspective showing that the wage gap exists at all levels but that it is

¹ Available at <https://www150.statcan.gc.ca/n1/pub/71-607-x/2018016/cpilg-ipcgl-eng.html>

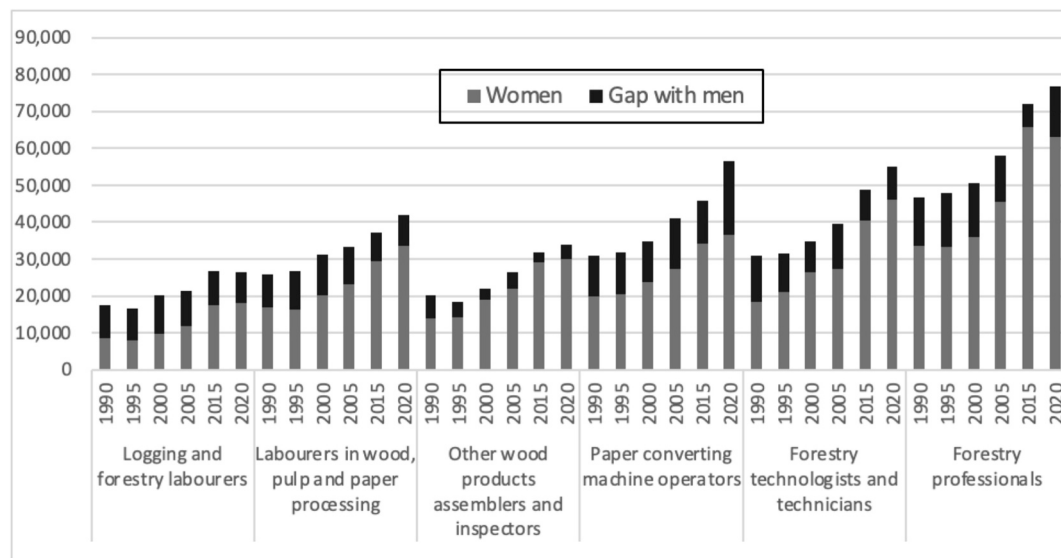


Fig. 6. Average annual income of women and men in six forest sector occupations, 1990–2020.

lessening in most occupations. Progress in the proportion of jobs held by Indigenous people has been more pronounced, and this is coupled with greater and more long-standing emphasis in Canada's national reports and strategies that encourage employment of Indigenous workers. Although proportions of immigrants have increased slightly over time, there has been almost no evidence, either in policy statements, or in changing employment figures of focused attention on increasing diversity in the sector by attracting immigrant populations. In the forestry sector overall, "diversity" is highly segmented, with Indigenous people being more likely to be hired in seasonal work in logging, women to be found in lower-paid administrative positions, and immigrant workers to be located in non-management manufacturing jobs. The overall segmentation of the labour force over the last 20 years remains, although women are increasingly working as professional and technical foresters (8 % to 19 % and 15 % to 21 %, respectively, between 1991 and 2016). There are indications that Indigenous people are gaining a foothold in manufacturing due to increasing numbers of Indigenous companies and that more immigrants are securing management positions, but data is insufficient.

These results are consistent with analysis of workforce diversity in the US particularly the limitations and inadequacies of current workforce data in keeping pace with the changing socio and economic conditions (see Korhonen et al., 2024) and corroborate understanding from the broader economics literature showing persistent gender segregation in employment, especially in more developed countries compared with less developed countries (Bertay et al., 2025; Lippa et al., 2014). While our research does not provide explanations of the factors contributing to the overall underrepresentation of women, Indigenous Peoples and immigrants in Canada's forest sector, previous studies in Canada and similar contexts suggest that the factors contributing to such inequities are complex and varied, including multifaceted institutional and personal elements (see Batavia et al., 2020; Westphal et al., 2022; Korhonen et al., 2024). This makes it difficult to assign a singular root cause and its corresponding mitigation. We anticipate that a deeper analysis to uncover and address causes will require targeted qualitative studies and must be driven by broader considerations beside business competitiveness.

The understanding of what constitutes and motivates progress towards EDI has shifted slightly. Early government efforts focused on increasing the proportion of women in Canada's labour force and appear to have been motivated by the notion that it was the right thing to do. For example, the Royal Commission on the Status of Women was tasked with identifying opportunities for gender equality in the labour force as

part of its mandate "to ensure equal opportunities for women with men in all aspects of the Canadian society" (Bird et al., 1970: ix). Similarly, the 1995 Federal Plan for Gender Equality argued for recognition of diversity among women, suggesting that all women should receive a fairer share of the benefits of their labour (SOWCanada, 1995: parag 37). This may have influenced the significant place for women in the 1997 SOCF report, although the 1998 strategy mentioned neither women nor gender. More recently, the scope has broadened to consider gender, sex, and other intersecting factors and motivations have expanded to include competitiveness, productivity, profitability, and innovation in the sector, as demonstrated by the 2020 report. Although much of this expansion has been motivated by recent large-scale policy shifts (e.g., SDGs) and social movements (e.g., Black Lives Matter), in the forest sector, the dominant motivation has been led by the private and professional organisations who have focused on current shortages in the labour forces and on diversity as a competitive advantage (e.g. FGF, nd; FPAC, nd), also referred to as the "business case" for diversity (Johansson and Ringblom, 2017). Across major forest producing countries in Europe and North America, the business case for gender and diversity remains the most dominant driver of diversity initiatives. The business case is driven primarily by the desire for economic growth, profitability, competitiveness and the need to secure workforce for the forestry industry (Holmgren and Arora-Jonsson, 2015; Ville et al., 2023). While this case is a powerful motivation for the private sector to engage in diversity initiatives, previous research has questioned the long-term effects of the business case for diversity (Holmgren and Arora-Jonsson, 2015; Johansson and Ringblom, 2017). The major concern is that if political priorities change and/or economic conditions reduce labour requirements, overall diversity initiatives may suffer (see Thomson and Gooberman-Hill, 2024). Other researchers have also argued that business case framings are detached from power relations in which gender has an intrinsic value, thereby obscuring structural factors that create inequality (Appelstrand and Lidestav, 2015; Holmgren and Arora-Jonsson, 2015; Ville et al., 2023). Thus, while fairness, improving competitiveness, and addressing labour shortages are three powerful drivers for increasing diversity, in forestry, the forest sector is highly cyclic, and an economic downturn could weaken arguments for two of these drivers, possibly leaving EDI progress reliant upon fairness. Yet, fairness considerations alone are unlikely to be effective or sustained without economic, policy, or regulatory backing (Thomson and Gooberman-Hill, 2024).

5.2. Data issues and limitations

Our analysis reflects significant limitations in data availability, access, comparability, and precision. This is consistent with the general lack of standardised measures for tracking outcomes on EDI initiatives in the forest sector (FSC, 2021). The Census provides the most complete data set including sub-sectors, occupations, income, and demographic details, but is only available every five years. The quarterly Labour Force Survey provides more frequent and rapid data, but public data do not allow monitoring of trends in single sectors, such as forestry, or specific occupations. Statistics Canada can provide custom data sets with more detail for purchase. Categories used to code data on industry, occupation, and identity are being modified to reflect current needs, but remain insufficient to fully explore EDI in the labour force. For example, data on immigrants in industry sectors only became available in 2006, while equivalent data for Indigenous people began in 2016. Data on other equity-denied groups (e.g., non-binary or differently abled) and are not available while the category “immigrants” includes a wide range of people including western white men who have been historically privileged in the sector. Furthermore, our analysis has examined groups discreetly; available data sets do not allow us to examine how identity factors intersect (such as for immigrant or Indigenous women) to compound inequalities, although research has long demonstrated the impact of these intersections (e.g. Kihdo, 1991). Korhonen et al. (2024) suggests that compared with women (and gender which has received significant attention in the literature), there is a comparative lack of understanding of the workforce dynamics along various racial, ethnic, and immigration status cross-sections and intersections. Generally, gender has received significant academic attention in the forest sector workforce (Sjölje et al., 2023; Crandall et al., 2020; Baublyte et al., 2019; Larasatie et al., 2019). Our findings emphasize the need to adopt an intersectional and disaggregated approach to tracking EDI outcomes focused on multiple and overlapping identities including gender, diversity, race/ethnicity, immigration status, disability, and class.

Quantitative data have the advantage of being “equally” available across the country but are insufficient to explain progress (or its absence) in building equitable and inclusive workplaces. According to Ville et al. (2023) gender and diversity strategies emphasized in policy documents and used to track diversity commitments continue to focus on statistics highlighting the focus on technical approaches. Yet, standardised quantitative national data sets do not allow the evaluation of recruitment, hiring, and retention strategies, for example, or employees’ perceptions and experiences concerning their acceptance in the workplace (Boakye-Danquah et al., 2022). The national reports we reviewed are clearly insufficient for this task as well, given the near absence of discussion of the labour force, let alone the conditions under which they work. While employers are increasingly adopting EDI policies and actions, monitoring and reporting progress is neither standardised nor required (see also Peltier-Huntley, 2019), neither do we know what works and how. Census data does show that provinces have achieved different outcomes, and a longer time series could help show trends, but we were not able to examine policies and actions for inclusion, nor to consider why provincial outcomes differ. These questions may be more amenable to qualitative studies and case studies, but we consider that monitoring national progress on EDI requires quantitative data that is both more detailed and more frequent. Waring’s (1988) argument about the invisibility of women’s work remains valid but is no longer limited to women.

5.3. Linkages between policies and outcomes

Evidence linking government policies and strategies to measurable outcomes on EDI in the labour force is weak. While Indigenous Peoples have been a key theme across Canada’s National Forest Strategies and SOCF reports, this has focused on issues such as knowledge, traditional practices, rights, and participation, with employment and business

development being less common.

Women were mentioned in only one national strategy and in 12 of the 30 SOFC reports, while immigrants have been almost completely ignored. Most mentions of women as workers in the forest sector have been anecdotal – profiles of six women in each of the 1998 and 2019 SOFC reports. It is not until 2020 that SOFC reports provide national data on proportions of Indigenous people, women, and immigrants in the labour force. Federal government policies for gender, diversity, and immigration (SOW Canada, 1995; Canada, 2023) do not appear to have influenced national forest sector policies. Where forest strategies and reports do refer to employment and labour force issues, they do so without referring to EDI, with the result that EDI as a goal becomes invisible. Additionally, “neutrality” implicitly assumes that actions to promote training or recruitment in the sector will be equally effective for men, women, Indigenous people and immigrants, despite evidence that shows that such an approach effectively favours the *status quo* (e.g., Josefsson, 2024). None of the strategies or SOCF reports provides specific objectives against which EDI progress can be evaluated.

The weakness of linkages for EDI in the labour force should be compared with much stronger linkages for Indigenous Peoples’ roles in forest management. Employment and business opportunities for Indigenous Peoples appear to have benefitted from objectives and actions associated with their knowledge, traditional practices, rights, and participation in forest management. Federal programs such as the First Nations Forestry Program and the Aboriginal Forestry Initiative have provided support for a wide variety of actions; the National Aboriginal Forestry Association provides regular reporting on the growing number of forest tenures held by Indigenous Peoples; and most provincial governments have developed their own programs to support Indigenous employment in the forest sector. For example, in 1999, the Saskatchewan government set a new policy to expand the forest sector and increase timber allocations to Indigenous businesses. Twenty-five years later, Indigenous allocations have risen from 11 % to 30 % (Saskatchewan, 2023) and the Province now reports the highest proportion of Indigenous people employed in forestry compared to any other province (27 %). While we have not attempted a comprehensive policy analysis for this study, the extent of objectives, actions, and reporting for Indigenous Peoples in forest sector employment strategies and reports is greater than that of EDI issues. This is appropriate given the history of land and resource appropriation during European settlement. The greater focus and corresponding results, however, support the view that progress in EDI will require good targets, good data, and strong policy commitments over time. We position our work as a first step towards mapping policy intent of inclusion and calls for future research to triangulate these macro findings with *meso*/organizational (e.g., HR systems) and *micro*/individual (e.g., feelings of belonging) analysis using surveys and case studies to help bridge the policy and practice gap more effectively.

6. Conclusion

Canada has shown significant commitment to advancing social sustainability in forestry and efforts to advance opportunities for EDI in the workplace at a national level align with this commitment. Our national overview of EDI journey in Canada’s forest sector shows slow progress and provides a pioneering analysis of macro-level federal data that is needed to ground evidence-based EDI policies and programs. Analysis of forest sector policies, strategies and reporting shows that existing initiatives rarely address workforce diversity except for opportunities aimed at Indigenous workers. Census data show modest and inconsistent progress with respect to labour force participation, income, and job segregation for Indigenous people, women, and immigrants. Given Canada’s long commitment to advancing social sustainability in forestry, the slow and uneven progress towards EDI suggest that the social goals are less prioritized, promoted or resourced. This can undermine progress towards SDGs 5, 10 and 8, and suggest the need to pay

more attention to structural and cultural barriers that sustains inequities in the forest sector.

However, the benefits of this national level overview are in its ability to identify structural gaps and opportunities that individual organisations and sub-national governments are incapable of addressing alone. Despite this, the inadequate and limited data do not support a comprehensive EDI assessment. Improvements to advance EDI in forestry at this macro-level will be made if multiple motivations – ethical, justice, sustainability, and economic – work together to support change. Importantly, however, as noted by Marilyn Waring in 1988, to make meaningful change, we need to set clear targets, introduce new practices, implement appropriate actions, and report publicly on the results. Addressing these knowledge gaps would require targeted research including: (a) government backed quantitative research, such as through future censuses, that expands custom tables and disaggregate forest specific labour force data; (b) qualitative studies by academics that capture and amplify the lived and employment experiences of forestry workers, particularly from Immigrants and Indigenous peoples backgrounds; (c) organizational or firm level case studies of EDI commitments and programs and their outcomes. Such studies could inform evidence-based action for Canada to achieve an equitable, diverse, and inclusive labour force and demonstrate how forestry can contribute more broadly to the social goals of sustainability and become a more equitable society.

Finally, our findings contribute to the evolving need to develop and refine frameworks, tools and data to measure and track EDI broadly and in the forest sector within and beyond Canada. The current lack of standardization of EDI frameworks and data sources make it challenging to compare and aggregate data across countries and sectors. Successful determination and application of key progress indicators for EDI will require linking EDI measures with outcomes, tracking metrics over time, and continually engaging with organisations to ensure relevance, validity and reliability while respecting contextual differences.

CRedit authorship contribution statement

John Boakye-Danquah: Writing – review & editing, Writing – original draft, Supervision, Formal analysis, Data curation, Conceptualization. **Stephen Wyatt:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Maureen G. Reed:** Writing – review & editing, Writing – original draft, Validation, Supervision, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data files used in this analysis are available from the lead author upon request.

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