

Western University

From the Selected Works of Bipasha Baruah

2021

Navigating Sticky Floors and Glass Ceilings: Barriers and Opportunities for Women's Employment in Natural Resources Industries in Canada

Bipasha Baruah, *Western University*

ARTICLE

Navigating sticky floors and glass ceilings: Barriers and opportunities for women's employment in natural resources industries in Canada

Bipasha Baruah¹ | Sandra Biskupski-Mujanovic²

¹Department of Women's Studies and Feminist Research, Western University, London, Ontario, Canada

²Women's Studies and Feminist Research, Western University, London, Ontario, Canada

Correspondence

Bipasha Baruah, Professor and Canada Research Chair in Global Women's Issues, Department of Women's Studies and Feminist Research, Lawson Hall Room 3244, Western University, 1151 Richmond Street, London, ON N6A 5B8, Canada.
Email: bbaruah@uwo.ca

Abstract

Women make up almost half the Canadian labour force and more than 50% of post-secondary students. However, in natural resources (NR) industries (energy, mining, forestry), they represent less than 20% of the workforce, face persistent wage gaps, hold traditionally gendered roles (in sales, administrative and support services) instead of technical or managerial positions, and are persistently absent from leadership roles. Retention of women is also a big challenge in these industries: many tend to leave their jobs within the first five years of employment, and/or after one or more maternity leaves. Women are very poorly represented in leadership positions (as senior executives and board members) despite significant evidence that gender diversity in leadership is good for business. Findings from our study of the status of women in NR employment in Canada produced concrete policy recommendations for recruiting, retaining, and promoting women in energy, mining, and forestry. Although these are intended specifically for Canadian organisations, they may also be relevant for other countries where women are underrepresented in NR industries.

KEYWORDS

Canada, employment, energy, forestry, gender equality, mining, natural resources, women

1 | INTRODUCTION

Women make up more than 50% of post-secondary students and almost half the labour force in Canada, but they have always been less than equitably represented in the natural resources (NR) industries of energy, mining, and forestry, which account for 17% of Canada's gross domestic product (GDP). While women account for 48% of the national labour force in Canada, women's share of employment in the forest, mining, oil and gas industries remains below 20%. Only 16% of workers in the forest sector and 19% in mining, oil and gas are women. Furthermore, women tend to find themselves in sales and administrative support positions in NR much more often than in technical or managerial positions. Although women's wages in NR sectors have increased over time, female employees still face a persistent wage gap compared to their male counterparts. Retention is also a big challenge in these industries. One study reports that while 30% of graduate mining recruits are women, the proportion of those same recruits drops to 10% at mid-level management (PwC, 2015). There is a strong awareness within the mining sector about this "leaky pipeline," but efforts made to stem the outflow of female talent have clearly not been effective. Although women executives may be reasonably well represented across a range of roles in these industries, including in human resources, finance, and public relations, they are not well represented in operations—a role often considered a stepping-stone to board service. Thus, women are also poorly represented in leadership positions (such as in senior executive positions and on boards) of both publicly and privately traded NR companies (MacDougall et al., 2018).

The barriers women face in NR industries are similar given that they are all non-traditional occupations (NTOs) for women. A NTO is defined as any occupation in which women or men comprise less than 25% of the workforce. Thus, nursing and primary education, for example, are NTOs for men in Canada whereas mining, energy, forestry, construction, and transportation are NTOs for women. Some occupations within these sectors (for example, human resources, administrative and clerical services, financial services) may indeed have more than 25% (or even 50%) female workers, but women tend to be a minority in the operations and trades segments of these sectors and often also in management, senior leadership, and boards of directors.

In this article, we complement secondary knowledge synthesis (of available statistics and literature) and primary research (data collected from 30 semi-structured interviews conducted with NR employees) to understand the barriers and opportunities that impede or facilitate women's entry, retention and advancement in NR employment in Canada. We undertook this study at the request of Natural Resources Canada (NRCan), the federal government agency responsible for the energy, mining, and forest sectors in Canada. We did not include employment in fisheries and oceans in this project, although such sectors are also based on the management of NR, because a different federal agency (Fisheries and Oceans Canada) is responsible for them in Canada.

We have published elsewhere about the ways in which the patterns of women's employment in renewable energy (RE) sector is both similar and different from the oil and gas sector (Baruah, 2017). As a young and more dynamic sector, RE may be open to diversity and change in ways that are harder to effect in the older and more mature fossil fuel sector. Findings from our previous research (Ferroukhi, Renner, Nagpal, García-Baños, & Baruah, 2019) suggest that although renewables employ more women than fossil fuels, women in the RE industry continue to face persistent barriers to entry, to remain in the workforce, and to advance to senior executive and leadership positions. Removing these barriers is essential to meet the growing demand for skills in an expanding global RE industry. The recommendations we make in this article for optimising women's participation in NR industries apply well to both renewables and fossil fuels.

2 | STUDY METHODOLOGY AND LIMITATIONS

The literature review for this study included both peer reviewed and practitioner knowledge sources. Scientific literature on women's employment in NR in Canada is limited (and often outdated), but there is a significant amount of "working knowledge" available from practitioner sources such as government agencies, industry associations,

research and policy think-tanks, professional groups, NGOs and advocacy organisations working on employment equity in NR and in the broader economy. We drew upon both bodies of literature to better enable policymakers and other end users of this research to fully appreciate the nature, magnitude, nuance, and complexity of the issues involved.

Following completion of the literature review, we conducted empirical primary research in the form of open-ended questions for 30 in-depth semi-structured interviews with key informants (including policymakers) working in energy, mining and the forest sector at federal, provincial and territorial levels as well as with industry associations, private sector organisations, and women's professional networking and advocacy groups. Key informants for this study were selected purposively to represent a range of career stages (recent graduate, new recruit, early career, mid-career and senior levels) as well as diverse cultural or ethnic backgrounds, education levels and family situations (single, divorced, married without children, married with children, for example). We did not have any informants in this study who identified as being recent immigrants (although several were established immigrants) or as having a disability. Therefore, very specific employment issues that affect only these groups may not be identified in this report.

The interviews provided qualitative information about the barriers and opportunities faced by women in these sectors as well as recommendations for removing barriers and optimising women's recruitment, retention and advancement in NR employment. We asked each respondent to describe their educational and professional trajectories into the positions they currently held. We also asked them to reflect generally on opportunities and constraints they had experienced at different stages of their careers, and more specifically on how gender might have shaped such experiences and perceptions. Finally, we asked respondents to provide recommendations for addressing challenges and optimising opportunities experienced by women at early, middle, and senior stages of their careers in energy, mining, and forestry.

We used inductive theme identification and explanation building from the interview data to generate findings from this study. Inductive thematic analysis entails allowing the themes to emerge from the data. We conducted the knowledge synthesis of existing scholarly and practitioner literature on women's employment in NR industries prior to conducting the interviews, but we did not approach the interviews with preconceived issues or themes we expected to find based on the literature review. Instead, we asked interviewees to speak about challenges and opportunities specific to recruitment, retention and advancement in their careers. Since the themes from the interview data emerged in the same order (recruitment, retention, advancement) in which we asked our questions, we also present them in the same order in this article. We triangulated findings from the primary (interview) data and secondary (literature review) data to generate external validity for our findings. Thus, although we do not provide an extensive review or synopsis of the literature on women's employment in NR industries at the outset of this article, the existing research and literature on the topic features prominently alongside the analysis of primary (interview) data in the following findings section, which constitutes the bulk of this article.

3 | FINDINGS: BARRIERS AND OPPORTUNITIES FOR WOMEN IN NR EMPLOYMENT

Findings from this study are organised under three broad themes in this report: (a) Recruitment; (b) Retention, and (c) Promotion, Advancement, and Leadership. These three themes and the various issues listed and discussed under each theme are interrelated and mutually inclusive. Although we organise and discuss them as separate themes in this paper, the issues themselves transcend categories—much like the barriers and opportunities encountered by women in NR sectors. Thus, recommendations made to improve recruitment, for example, may also have positive effects on retention and advancement. We ask that the reader approach the themes and sub-themes presented in this paper with their interrelatedness and mutual inclusivity in mind.

In this article, we provide policy recommendations for NR industries, rather than separately for the energy, mining and forest sectors. Of course, in some instances we point specifically to issues that must be addressed by a certain sector. For example, the incidence of sexual harassment was reported as being highest in field operations in mining, and as we emphasise, must therefore be addressed specifically by the mining industry.

3.1 | Recruitment

In Canada, the NR sectors were historically explicitly exclusionary toward women. Until 1978, the Mining Act in Ontario, for example, prohibited women from working underground, with only very limited exceptions (Keck & Powell, 2006). The oil and gas industry was also inhospitable for women. The province of Alberta, and more specifically its northern oil sands region, is still often described as a frontier—a harsh landscape, rich with potential for those “tough” enough, “strong” enough and “man” enough to make it. And like the frontiers of old, those who do not fit the traditional (typically white) male ideal of the oil and gas industry still struggle to succeed in the mythologised frontier of present-day Alberta (Hill, Alook, & Hussey, 2017).

In the Canadian forest sector, an initial professional entry point for women was as research scientists working in federal government laboratories in the 1920s and 1930s (NRCan, 1998). For many decades, lab work remained one of the few areas open to women, and even in 1958 when Francis Wetton became Canada's first female professional forester, women were largely unwelcome both in the woods and in forest sector boardrooms (Teske & Beedle, 2001). More than sixty years later, fewer than 20% (depending upon the region of the country), of practicing registered professional foresters are women. The patterns and evolution of women's employment in the energy, mining and forest sectors are similar. The women who did join these sectors over the decades worked overwhelmingly in lower-paid non-technical administrative and support positions. Although the numbers of women in professional and managerial ranks have grown in the past twenty years, these sectors remain very gender unbalanced, especially when compared to other industries in Canada. We have organised challenges and opportunities related to recruitment of women under the following nine themes:

3.1.1 | Lack of information and awareness about careers in NR

One of the enduring legacies of women's exclusion from these sectors in the past is the continued disadvantage women and girls face in comparison to their male counterparts in accessing information about employment in these fields. Other research on the topic of women's employment in NR industries have noted that women face greater barriers in accessing professional networks and finding out about job openings in these sectors (see, for example, MiHR, 2015, 2016; PwC, 2015). This may at least in part be attributable to the fact that personal networks are critical for entering and succeeding in these fields, and women and girls are often unable to access such networks at par with boys and men (MiHR, 2016). Findings from our study provided additional nuance and detail about the causes and consequences of women's inability to access NR career information at par with men.

Careers in these fields are pitched less frequently to girls and young women than to boys and men through formal channels such as career counsellors, student employment advisors, recruitment sessions or career fairs. Women who interviewed for this research, and who presently work in various scientific, technical and administrative appointments in NR, emphasised that they had never been informed about careers in NR in high school or even in the early years of university. Several women who interviewed for this research and held technical positions within these sectors identified male professors as having been influential in their decisions to pursue higher education and training in STEM fields. Since women are also a minority in technical fields in academia, women who did study STEM fields rarely had female professors as supervisors or mentors. A phrase repeated often by key informants for this study was that women tend to “stumble into” these fields. Although concerted effort has been made in recent years by

educational institutions, human resource organisations, industry associations and gender equality advocacy groups to increase awareness among girls and young women about careers in NR, they remain disadvantaged when compared to young men and boys.

Informal networks play an important role in transmitting career information in NR industries and this can often also disadvantage women and girls. Since men were almost exclusively employed in NR for so long, a significant amount of information about job opportunities and skill transferability continues to travel, whether intentionally or unintentionally, through male familial and professional networks. Young men tend to get job opportunities in these fields through (typically male) family connections while women usually do not have the same social networks, and even if they do, information about NR careers is rarely shared with women and girls. “Getting hired in the petroleum sector is almost exclusively about contacts, not capability,” noted one female geoscientist with a 30-year career in the oil and gas industry. Several others who interviewed for this research mentioned having fathers, grandfathers or uncles who worked in NR. They were quick to emphasise that no one within the family had shared information with them about careers in NR. This finding was validated frequently in published literature and media reports on the topic of women's underrepresentation in NR employment (Sponagle, 2018; Teske & Beedle, 2001). Of course, there is nothing wrong with career information passing through familial or other informal networks. For both men and women, having a parent or other family member in a certain occupation can be an advantage when seeking a career in the same occupation, and women can also benefit occasionally from such networks. As an example, some of the most successful female mining executives in Canada come from mining families. They have clearly benefited from family networks. An interviewee who works in mineral planning and development in the Yukon emphasised that for those women and men who do not have such networks, or who may not be able to benefit from them, there is an urgent need to level the playing field by mainstreaming, that is, improving equity in access to employment information:

It's about who you know in mining. People don't know where to look. You need to approach contractors to get work in mining companies, not the companies themselves. A lot of people don't know that. It's worse for women because they're less likely to have that information passed on to them through informal channels. I have a master's degree in NR management. I stumbled into mining because an uncle had worked previously for a private sector exploration company. When people approach me about work in mining, I guide them, but we need a more institutionalised information system about employment in mining for people to get a foot in the door.

Direct access to industry “insiders” with experience can offer a strong counterbalance for lack of awareness about work in these sectors. Recent labour market data released by the Mining Industry Human Resources Council (MiHR) shows that the mining labour market is much tighter than other sectors. For every job vacancy in mining, there are fewer than three potential job seekers across Canada, compared to six job seekers per vacancy for all other industries (MiHR, 2015). To attract new talent, it might also be possible for the industry to “simulate” those valuable personal connections through strengthening practices such as mentoring, outreach presentations and visits, site tours, and temporary work placements (MiHR, 2016).

3.1.2 | Lack of awareness about range of opportunities available within NR sectors

A related barrier for women's employment in NR was a lack of awareness about the range of occupations and specialisations within these sectors. Those who interviewed for this research mentioned that most people tend to associate NR with one or two occupations or activities such as underground mining, oil drilling or cutting down trees when in fact these sectors draw upon expertise and skills from diverse backgrounds in biology, environmental science, ecology, conservation, business management, law, public policy and financial services: “People think of mining and conjure images of prospectors and underground miners. Not of lawyers, environmental scientists, health and safety professionals, equipment manufacturers.” Several key informants working within human resources in mining suggested that this may partially explain why women were underrepresented in mining both in occupations

traditionally associated with a higher representation of women (human resources, for example) and a lower representation of women (physical sciences or trades and production, for example). In human resources departments of other industries in Canada, women often make up more than 50% of employees. In mining, even this figure is below the norm compared to other industries. In STEM-related fields, women hold 19% of Canada's professional and physical science occupations; in the mining industry, women represent only 16% (MiHR, 2016). A lack of awareness about the range of opportunities appears to be a strong deterrent for women's entry into mining.

An MiHR employee working on employment and diversity initiatives emphasised that women were not the only underrepresented group that did not understand the mining sector:

It's not just women who don't understand career opportunities in mining, new Canadians don't either: you can operate an underground digger while based in Toronto, you can work remotely. The range of opportunities in mining is immense but people only have that image of the underground miner with the lamp on his head.

During our interviews, similar observations were articulated about the forest sector by registered professional foresters:

The range of employment opportunities within forestry needs to be better articulated: forest conservation, green and renewable resources, sustainable wood products, non-timber forest products. The image the average person has of forestry is of a lumberjack. That is from a century ago. Automation and artificial intelligence are making the jobs safer and if deployed strategically have the potential to level the playing field for women and people with disabilities.

3.1.3 | Need for a purposeful rebranding of NR sectors

Those who were interviewed for this research emphasise repeatedly, that lack of awareness about the range of opportunities available within these sectors was not a disadvantage that only women faced. Canadians in general were perceived to be poorly informed of opportunities within these fields and the significance of these sectors to national development. Interviewees also frequently mentioned negative perceptions of the environmental damage caused by these sectors as deterrents for entry. Images of abandoned mines and hydro dams as well as practices such as clear-cutting forests and dumping of mining tailings into lake systems, that may have been more common in the distant past, still appear to loom large in public consciousness. A science policy advisor with the Canadian Forest Service elaborates:

Unlike rainforests, Canadian forests are a completely renewable resource, but that message is constantly lost, and people think of the forest sector as destroyers of the environment. The way forests are managed and harvested in Canada today is completely different from 100 years ago.

Other interviewees noted that downturns in these sectors and media reports about mass layoffs, oil spills (even when they happen outside Canada) or nuclear accidents (anywhere in the world) have very negative effects upon the industry's ability to recruit and people's desire to enter the industry. The fact that these industries have made consistent and significant progress in safety standards and environmental sustainability appear not to permeate public consciousness or "make the headlines" (as one mining executive put it) in the same way that the rare accident or spill does. A project manager at Chalk River Nuclear noted that although countries like France and Germany have made strides in this regard, the message that nuclear energy is clean energy is not well understood or accepted in Canada.

Considering such persistent negative public perceptions and lack of public awareness about the systematic changes these sectors had undergone over the past few decades, almost every key informant for this study felt strongly that NR sectors were in urgent need of a purposeful rebranding. An interviewee who works in a private equity mining fund articulated it thus:

Mining is a bricks and mortar industry; one Canada cannot do without. Twenty years ago, we didn't need to think about social acceptability and environmental impact while thinking about pensions and endowment funds.

Now we have to. You can't mine like you used to 20 years ago. The mining industry is terrible at communicating changes and marketing itself. It's high time for a purposeful rebranding and reintroduction to attract new talent. We're no longer your grandfather's mining sector, but the average Canadian doesn't know that.

In attempting to rebrand these sectors as high-quality sources of employment, interviewees emphasised that it was important not just to focus on the higher wages that could be earned in NR compared to other industries, but also to present these sectors as caring about the environment, social responsibility, gender equality, racial and cultural diversity, the potential for career development, job security, and work-life balance.

3.1.4 | Lack of information about skill transferability

During interviews, conversations about the need to rebrand and reintroduce these sectors to Canadians was often followed closely with conversations about inter-sector and intra-sector skill transferability. Our research revealed that there are many transferable skills between and within the NR sectors, and that workers are often employed in more than one sector or more than one occupation within a sector during their careers. This is especially true for energy and mining. Thus, it is not uncommon for pipelines, oil and gas, clean energy, and mining to compete for workers. Because of their better established familial and social connections in these industries, male workers can benefit much more often from moving between sectors. Those interviewed for this study agreed that having better access to information about skill transferability would benefit everyone, but is especially important to enable women to compete on a more level playing field:

I have an M.Sc. in environmental science from Queen's University. I started out as an environmental scientist at Chalk River Nuclear, but I am now a project manager because I accepted opportunities as they came along. Other women often ask me how I stepped into a management role. There isn't clear information about career trajectories in these fields and women often have more difficulty stepping into new roles.

Men were much more likely to change employers or to move into new roles with the same employer, and to report that doing so had a positive impact on their careers (MiHR, 2016).

Other empirical evidence about the combined outcomes for women of weaker professional networks and less knowledge about skill transferability emerged during our interviews with female geologists working in the oil and gas industry. Education in geosciences has become very gender-equitable in Canada. Women frequently outnumber men in geology departments, but there is still a big gap between equity in education and equity in employment. Female geologists (both established and early career) emphasised that young white men are hired much more often than any other group employed in geoscience within the oil and gas industry. Women with geology degrees are much more likely to be unemployed (or eventually work in an unrelated sector) than their male counterparts. During oil and gas industry downturns, female geologists are more likely to find themselves let go (and to remain unemployed for longer) than any other group of geologists. Even when senior male geologists are let go during industry downturns, they can tap into their professional networks to seek employment much more easily than junior female geologists. In a paper entitled "Disproportionately Unemployed: The Gendered Impact of the Economic Downturn on Geoscientists in Alberta," presented at the Geosciences Convention in Calgary in May 2017, Professor Rachael N. Pettigrew from Mount Royal University and Marian C. Hanna, President of the Canadian Society of Exploration Geophysicists, analysed employment data from Statistics Canada for 2014–2016 in the parent category NOC 21: Occupations in natural and applied sciences and, more specifically, in NOC 2113 (subcategory of NOC 21 for geoscience professionals). They note that at various points over these two years, female geologists were often twice as likely as men to be unemployed. For example, in April 2015, the unemployment rate for female and male geologists was 7.5 and 3% respectively. They elaborate:

Female geoscientists only represent a small proportion of the industry. They may now be chronically underrepresented in the field. The disproportionate unemployment of female geoscientists has severe implications on both the industry and the individuals. Potential consequences include the negative impact on career progression for

women, the impact of work interruptions on earning potential, a remaining gendered-unbalanced applicant pool for promotions, significant challenges for workforce re-entry, and the industries' loss of key talent and experienced women who decide not to return. Due to this disconnection from the workforce, there may also be fewer potential female STEM professionals, including female geoscientists and engineers, who would qualify for executive and board positions.

We interviewed one of the authors of the paper on female geoscientists in Alberta for this study. Given the greater challenges women faced in seeking employment in geology, she cautioned against uncritically encouraging and promoting STEM education for women and girls. Instead, she called for more nuanced analysis of women's employment in different STEM fields, more initiatives to level the playing field for women, and more attention to skill transferability and versatility.

3.1.5 | Need for more versatile training to enable cross-sectoral transition

Employment in NR is volatile due to a range of predictable and unpredictable factors: fluctuations in world energy prices; growth in countries like China and India that import Canadian NR; political forces; environmental issues; treaty issues with Indigenous groups; new resource discoveries; and technological changes, including those related to extraction and processing (Kazi, 2017). To deal with it, our key informants highlighted the importance of making training and education in energy, mining, and forestry more versatile to enable intra-sectoral and inter-sectoral transferability. Almost half the respondents in an oil and gas labour market analysis produced by PetroLMI in 2017 questioned the long-term sustainability of fossil fuels, in part due to the instability of energy prices and the ongoing shift to renewables (PetroLMI, 2017). In the same report, Jackie Rafter, President and CEO of Higher Landing Inc. notes, "Intervention is needed to create a market for oil and gas workers in other sectors and to mitigate the barriers for cross-sectoral transition. The case needs to be made as to why you need to hire a geologist."

There appears to already be some movement in this direction. For example, post-secondary institutions in Canada have begun to look for ways to deliver graduates with skills that are transferable across broader industry sectors rather than delivering petroleum-specific programmes. During consultations, post-secondary representatives indicated they are developing more integrated programmes as well as increasing business-related programming in response to the shifts in demand. Examples include programming to incorporate the full energy industry, both renewable and non-renewables; combining information technology with instrumentation; building cross-disciplinary and connected labs; introducing mechatronics programmes which combine electronics and mechanical engineering; adding courses to respond to digitisation trends; and, offering more courses in areas such as business and project management to help students increase their employability. These changes will benefit the fossil fuel industry since it may face greater competition from other sectors for these engineering graduates who have had integrated training and can consequently access a broader range of career options. Such changes may also enable the energy sector to employ and retain more qualified women. A survey conducted by Ernst & Young in 2017 of 1,200 young people below the age of 20 revealed a significant gender gap with a much greater percentage of young men finding oil and gas more appealing than young women – 54 versus 24% respectively (Egan, 2017). In the same survey, 62% of respondents said a career in oil and gas was unappealing or very unappealing. Two-thirds of those polled, with no significant gender difference, said that a job in renewables was appealing.

Similar changes are afoot in postsecondary institutions offering forestry programmes. Instead of just teaching traditional subjects like harvesting, silviculture and soil sciences, an increasing number of forestry programmes are focusing more broadly on teaching integrated programs on sustainable management of forests and protection of the environment. The University of Toronto's Faculty of Forestry now presents itself as the Faculty of the Environment (Cardwell, 2013). The demographics of forestry students have also changed. "We now have more women, city kids and non-whites, particularly Asians," reports Dr. Victor Lieffers at the University of Alberta. He credits the diversity in the student body and the slow increase in enrolment after steep declines in the 1990s and 2000s to a new

curriculum and the rise of new non-traditional career opportunities. “We’ve been trying to get across the idea that forestry isn’t just about cutting down trees, that it is a well-rounded, multidisciplinary and versatile degree with excellent job prospects,” says Dr. Lieffers. “It looks like that message is finally being heard: foresters are land stewards, not just lumberjacks.” This, in turn, will lead to more interesting opportunities and a growing demand for forestry graduates. “Twenty-five years ago, there were really only two routes for foresters: working for provincial governments that own the resource ... or working for the forest products industry,” says Dr. Don Floyd, Dean of the Faculty of Forestry and Environmental Management at the University of New Brunswick, “Now the opportunities include conservation authorities, marketing boards, NR consulting firms—you name it.”

One senior registered professional forester with the Canadian Forest Service noted that these changes would lead to more diversity in forestry in the future:

When I was at university in the 1980s, women were studying biology and ecology because they wanted to take care of the environment, men were studying forestry because they didn’t mind cutting down trees. Perceptions matter, it is important to change ideas about what you can do in the forest sector.

Although there is less evidence of more versatile training programmes in mining, the need for it was articulated by our key informants. For example, a lands and minerals policy analyst noted that the focus on mining engineering was too narrow and that general STEM training would be more useful in the future. “How do we attract people who want to work for Google and Amazon, who’ve never given mining a thought, to want to come to us?”

While highlighting the importance of skill transferability, it is important to emphasise that inter-sectoral and intra-sectoral mobility will lead to a zero-sum game of competition for highly skilled workers if large numbers of new well-trained workers do not simultaneously enter these sectors. The average age of workers in NR industries is currently in the late 40s or early 50s and the numbers of future retirees far outnumber the cohorts currently entering these sectors. In the forest sector, for example, there will be 60,000 positions to fill over the next 10 years in Canada, since the median age of the 120,000 current forest industry workers is over 50.

3.1.6 | Summer student work, co-ops, internships, apprenticeships

Key informants for this study identified summer student work, co-ops, and internships as major entry points into NR careers. Co-op programmes that are part of college diplomas and university degrees in fields such as mining engineering, petroleum engineering, geology, and professional forestry do well at providing students with relevant co-op work experience in NR. More female students could be provided with an entry into NR careers if co-op programmes and internships in fields such as environmental science, geography, public policy and administration, law, business and health, which tend to enrol large numbers of female students, were better aligned with the energy, mining and forest industries. Such an effort could be made through collaboration between governments, educational institutions and industry associations in concert with a purposeful rebranding of the NR sectors discussed earlier. We identify co-ops and internships as important vehicles for enabling young workers to gain experience in NR while simultaneously cognisant of the fact that such programmes are often abused by employers who may recycle interns or use them as a source of cheap or free labour, often displacing other workers. The alignment of more co-op and internship programmes with NR sectors is only desirable if such practices can be eliminated or minimised.

Apprenticeship training is a key method by which people acquire the skills and knowledge needed to become skilled tradespeople. We found apprenticeships in the trades associated with NR to be a major source of inequity for women. Women represent 52% of Canadians with post-secondary qualifications but make up only 13.7% of apprentices (Government of Canada, 2018). Moreover, there was a lower percentage of women in the Red Seal trades compared with male apprentices (59.2 versus 81.2%). The Red Seal Program, formally known as the Interprovincial Standards Red Seal Program, is a programme that sets common standards to assess the skills of tradespeople across Canada. In fact, when the female-dominated and lower-paid trades of hairstylist, cook, and baker were excluded, women made up only 4% of Red Seal apprentices in more lucrative male-dominated trades (Frank & Jovic, 2015).

The Government of Canada makes significant investments in apprenticeship through the Red Seal Program and a variety of financial supports and tax incentives for apprentices and employers. Yet, women continue to face many barriers to participation and success in the trades including socialisation and gender stereotyping, absence of mentors, difficulties finding employers, discrimination, and family obligations (ESDC, 2018). In the 2018 Budget, the Government of Canada committed to increasing women's representation in male-dominated trades through the Apprenticeship Incentive Grant for Women and the Pre-Apprenticeship Program. A commitment was also made to promoting equal access to training and jobs for Indigenous women through the Indigenous Skills and Employment Training Program. These are important interventions. Findings from this study endorse the importance of adequate funding and well-paid apprenticeships in enabling women and other marginalised workers to access employment in trades associated with NR. We simultaneously found that even if women could access funding and training in these trades, they were less likely than their male counterparts to find apprenticeships and permanent jobs after completing their training (Frank & Jovic, 2015).

The existing literature on apprenticeships reveals that the processes for seeking apprenticeships, which is a requirement before a worker can secure full-time employment in the trades, remains informal and unregulated in Canada. This was identified repeatedly as a barrier to women's entry into and advancement in the trades. Women in general, and racialised and disabled women in particular, are at a disadvantage in seeking apprenticeships. Research conducted in Canada and the US identified an inability to access informal and familial apprenticeship networks at par with men as a major impediment for women in gaining full-time employment in the trades (Little, 2005; National Women's Law Center, 2014).

The fact that many apprenticeships pay a nominal stipend is also a major barrier for many workers. Women entering the trades are often older than men entering the trades, and often have children to support. For example, in 2015 the National Apprenticeship Survey of Canada reported that slightly more than 10% of women registered for an apprenticeship were 45 years and older—5.7% were 45 to 49 years and an additional proportion of 5.4% were 50 years and older. Unsurprisingly, women were much more likely to report “personal or family issues” (20.5%) or having “disliked the work” (11.4%) as the main reason for not completing an apprenticeship than were men (9.0 and 7.3% of men, respectively). Having the opportunity to learn a trade while supporting a family is crucial in breaking down barriers that many poorly represented groups, including women, face in accessing skilled employment in the trades. The need for policies aimed at enabling fair and equitable access to paid apprenticeships (and internships, which are also often poorly paid or unpaid) is urgent and critical for promoting equity in these sectors.

3.1.7 | Wage inequity

There is significant evidence of gender wage inequity in NR employment in Canada. Average weekly wages for women in NR have increased over time from \$666 in 2000 to \$938 in 2015 but has certainly not been commensurate with men's wages in NR over the same period (\$1,342 in 2000 and \$1,608 in 2015). The fact that women's wages have increased in average by 40.8% while men's wages have increased by 19.8% between 2000 to 2015 is largely a consequence of gender-based wage inequity redressals instituted by the Government of Canada in favour of female employees. Even with such measures in places, men have continued to earn more than women in NR employment, both in government and the private sector. This gap continues to exist mostly because women are over-represented in lower-paid occupations such as human resources, administrative and financial services, but under-represented in higher-earning technical occupations and leadership roles, such as directors (NRCan, 2016). A gender-based demographic analysis of science and technology employees at NRCan revealed that the proportions of women and men represented at all levels (junior, middle, and senior) are significantly different; as the level increases, the number of women represented significantly decreases (Byvelds, 2016). Predictably, statistical analysis of salaries for the same group of employees revealed that after accounting only for an employee's occupational group (and not level), women's salaries are almost always lower than men's, further demonstrating the concentration of men at higher levels within groups. There is also significant evidence of gender wage inequality in mining (MiHR, 2016) and

forest sector. In a recent survey of 500 women working in the forestry and arboriculture sector across Canada and the US, 60% reported earning less than their male counterparts (Bardekjian, Nesbitt, Konijnendijk, & Lötter, 2018).

The causes of the persistent gender wage gap in NR are multifaceted, including women's greater concentration in lower-paying jobs and junior positions, their comparatively weaker negotiating abilities, greater likelihood of taking time off from their careers for parenting and caregiving, and attitudes and values of employers. There are no simple or straightforward solutions for addressing it. However, given such unquestionable evidence of a persistent gender wage gap in NR employment, making pay scale information publicly accessible is an important first step toward enabling all workers, especially women, to negotiate starting salaries, raises, bonuses, and promotions. All publicly and privately held NR employers should be encouraged to adopt the practice of making pay scales and information about career trajectories more transparent. Even anonymised salary data grouped by qualifications, skills and years of experience would enable applicants to understand what fair salaries are like at specific stages of career. All entry-level workers should be able to understand the career trajectories and possibilities for advancement specific to their sector. This would help level the playing field for women, who are more likely to lack the familial and social connections that often provide men with information about NR career and salary trajectories. Making pay scales transparent (or at least less opaque) can make an even bigger difference in addressing gender wage equity over the course of women's careers if it is coupled with institutional mechanisms for reporting, correcting and seeking redress for wage differences. Other changes such as alignment of the informal and formal reward systems, including a re-definition of the "ideal employee" for advancement, that emphasises performance over sheer number of hours spent at work, have been suggested by gender advocacy organisations in NR (MiHR, 2016).

3.1.8 | Taking non-standard work experience into account

Women are more likely than men to have temporary, part-time, unpaid, or volunteer work experience that may be relevant and transferable for employment in NR, but employers often only request information about paid work experience. Counting non-standard work as professional experience may significantly increase the numbers of women in NR jobs. An action plan published recently for Canada's mining employers emphasises that because women may have had non-traditional career paths, gaining skills in alternative ways, they may lack the direct experience that has been specified as required for a role. Interviewers are more likely to judge men based on their potential, but they are less comfortable doing so for women. As a result, they might discount women's non-traditional but applicable skills. To address this, Women in Mining (2016) recommends employers review experience requirements or identify alternative ways that the required skills can be acquired.

Evidence from comparable sectors such as construction in which women are underrepresented demonstrates the value of taking non-traditional work experience into account. Cohen and Braid (2000) conducted research on the British Columbia Vancouver Island Highway Project's (VIHP) efforts to recruit women and Indigenous workers as part of its commitment to employment equity. They found that at its peak production periods, the equity hires constituted almost 20% of the workforce, ten times higher than usual. Women's and Indigenous workers' participation in the project reached 9 and 11% respectively at peak times. Further, 93% of the workforce consisted of local hires. Active recruitment on reserves and in women's centres made a significant difference in the numbers of Indigenous women who applied for work on the VIHP, as did the decision to adjust the interview process to include unpaid and volunteer labour as work experience.

3.1.9 | Attracting young workers to NR sectors

The current workforce in NR is aging and retirees far outnumber new entrants. The ability to attract and retain young workers is critical for the sectors' future. A baseline analysis of youth employment in NR revealed that the workforce

is disproportionately male for both the young and adult workforce, but especially so for young workers below the age of 24. Specifically, for the youth workforce, 1.54% of men are in NR compared to only 0.25% of women for a ratio of 6.3/1 in favour of men. By contrast, for the adult workforce 3.1% of men are in NR compared to 0.79% of women for a ratio of 3.9/1 in favour of men. In other words, both young workers and women are disproportionately less likely to work in NR, but young women between the ages of 15 to 24 make up the group of Canadians least likely to work in NR. In fact, the disproportionate under-representation of youth in NR employment is largely because of an extreme under-representation of young women. Specifically, only 1.1% of all employment in NR is young women, compared to 8.5% in all other sectors. Young men represent 7.3% of all employment in NR, only slightly under their 8.5% representation in all other sectors. In mining, oil and gas, young women constitute only 1% of employment while the representation of young men, at 6.1%, is only slightly less than their representation of 8.5% in all other sectors (Gunderson, 2016).

Part-time employment is extremely uncommon in NR sectors. Only 7.2% of youths work part-time in NR compared to 49.1% of youths who work part-time in all industries. Part-time jobs tend not to be available for youth in NR while they are extremely common in other industries. Part-time NR employment is even more uncommon for adults: only 1.6% of adults work part-time in NR compared to 10.7% in all industries (Gunderson, 2016).

Since part-time employment can provide an entrance into the labour market for youths and facilitate the school-to-work transition, lack of part-time work in NR may be a barrier for young workers in general, young women in particular, as they are even more underrepresented in NR sectors than their male counterparts. Part-time work may also facilitate work-life balance for both male and female workers, who look ahead in their career and anticipate having a family when they are older (PwC, 2008). Our research did not reveal why part-time work is so rare in NR sectors, but we suggest that alongside co-ops and internships, creating more part-time work opportunities, where possible, may be a strategic way for NR sectors to attract young workers.

Hourly wages in NR are almost 50% higher than they are for young workers in other industries. Although young women comprise a very small group of workers in NR, they experience a much smaller (10%) gender wage gap than in other sectors. To attract young workers, particularly women, to NR, these facts are also worth publicising. The fact that these industries are more likely than other employers to offer workers permanent and secure jobs is also worth emphasising since young workers are much more likely today to find themselves in limited-term precarious work. Other values such as social responsibility, environmental sustainability, commitment to gender equity, support for professional development, work-life balance, and harassment-free work environments have been identified by previous research as factors that young workers consider when planning careers, and should also be highlighted in recruitment efforts (Gaudelli, 2009; Greening & Turban, 2000; Ng, Schweitzer, & Lyons, 2010).

3.2 | Retention

It is impossible to neatly demarcate the barriers and opportunities women face in entering NR sectors from those that influence their decision to leave or remain in these industries. Our research confirms that men tend to apply for jobs in energy, mining, and forestry even when they meet some of the requirements, but women tend not to apply unless they meet all requirements (Asia-Pacific Gateway Skills Table, 2015). Women are also less likely to negotiate salaries and benefits. Women usually have to outperform men in male-dominated industries just to fit in and certainly to progress. The preference for male recruits in NR is very much a “chicken and egg” problem—women often lack the necessary training and skills for many jobs, but these jobs have usually not been designed with women in mind and are therefore not particularly attractive. Thus, when it comes to selection, (male) managers are less likely to regard women as suitable candidates. Interviewees who worked in the private sector repeatedly emphasised a “disconnect between company rhetoric about recruiting and retaining women and the reality of entrenched male preference.” This chicken-and-egg problem is one that several organisations and initiatives are attempting to tackle in various ways. As emphasised by our interviewees, women encounter both “sticky floors and glass ceilings” in NR. In

other words, careers may never get off the ground because of persistent and confining stereotypes of feminised roles. And the absence of role models and gender-balanced initiatives make moving up the ranks more challenging for women.

Women choose to work in NR for the same reasons as men: for decent incomes, good benefits, company reputation, availability of work, and opportunities to build careers (Martz, Reed, Brueckner, & Mills, 2006). Yet, in responding to the underrepresentation of women in NR, employers often appear to rely more heavily on gender essentialisms and stereotypes to make these industries more attractive for women than on addressing issues related to equity in wages and working conditions. As an example, Goldcorp's promotional video in celebration of International Women's Day plays on gendered stereotypes to promote diversity in its workforce. Women in the video make statements such as "Like most women, I appreciate a good pair of shoes" (while pointing at their safety boots) or "Some would say a woman's place is in the home, I feel at home right here." Goldcorp's decision to paint a few of its mining trucks pink (Nelson, 2015) is another example of a strategy that simultaneously reinforces gender stereotypes while (ostensibly) trying to undo them. Governments, industry associations, private corporations, and gender equality advocacy groups have attempted to remedy some of the inequities and barriers women face in these sectors, but such interventions have been largely unable to subvert the broader social structures that create the inequities in the first place. Most policies designed to address women's underrepresentation in these fields tend to be reactive responses that do not engage adequately with broader societal structures and institutions that produce and maintain inequality. Improving lighting on mining worksites to prevent sexual assaults against women and requiring women to work in pairs instead of alone are classic examples of reactive policies that end up reinforcing social hierarchies rather than challenging them. The immediate safety risks for women can certainly be mitigated by certain actions and practices (better lighting and working in pairs, for example) but eliminating violence against women will require much deeper and more proactive engagement with the social structures and power relations that sustain and reproduce it. We found very little engagement in NR industries with the structural causes of sexual harassment and violence against women. We found that the most common response to women's underrepresentation in NR has been to "add women and stir," simply adding women to industries with unchanged masculinist values and work cultures (Harding, 1995).

Further, policy responses often reinforce affirmative gender essentialisms. Women are valorised in essentialist ways that also reinforce existing social hierarchies, for example, via common assumptions that women are gentler with machinery than men and therefore maintain machinery better (stated repeatedly in reports of women operating heavy machinery), or that women bring specific valuable qualities and skills to the job (empathy and patience, for example) simply by being women. This ends up reinforcing social hierarchies since most women acquire these skills because of historical and current social oppression, and not because they are biologically female. Instead of assuming all women are kinder, gentler, less corrupt, etc., than men, the argument should be for more women in NR because they are underrepresented in NR *and* because these sectors are in urgent need of new workers. Because women have never been well represented in NR industries, of course it is also possible that they will bring fresh perspectives and ideas to the table that could improve industry outcomes. Optimising women's employment in NR is vital both for upholding intrinsic principles of equity and fairness and for widening the talent pool in these sectors.

3.2.1 | Understanding barriers and opportunities along the career-cycle

In trying to understand women's career trajectories in NR, this research draws upon Peter Turnbull's (2013) career-cycle assessment of women's employment in transportation, which suggests that women face challenges at every stage of career in NTOs: attraction, selection, retention, interruption, re-entry and advancement. Initial attraction to NR industries may come from exposure at school, home and community, all of which are heavily influenced by the human resource policies of energy, mining and forest organisations (for example, corporate image, commitment to equal opportunities) and societal values (for example, prevailing views on what constitutes "men's work" and "women's work").

Most departures (resignations and dismissals) in NR employment appear to occur within the first 5 years of employment. Therefore, women's initial experiences—how they are welcomed and treated, and whether they are supported and promoted—are critical. This research supports this finding. For example, a gender-based demographic analysis of women employed in science and technology at NRCan revealed that women in secure indeterminate positions (often obtained after a few years of employment) were no more or less likely to leave than men. Even women in non-indeterminate positions at the senior level depart from their positions at rates equal to that of men. However, at the junior and middle levels, women depart from non-indeterminate positions in greater numbers than their male colleagues (Byvelds, 2016).

The tendency for women to leave jobs in NR industries after two or more maternity leaves was reported frequently in interviews. Success in retention of female employees, especially in the aftermath of interruptions for child-bearing or other caring work, appears to be dependent on the support of the organisation and co-workers. Attitudes of male co-workers were deemed particularly important in retaining women after career interruptions. While studying the transportation sector, Turnbull (2013) distinguished between gender-specific barriers, such as stereotypes about men's and women's work, and gender-intensified barriers, such as the absence of working arrangements to accommodate childcare and other reproductive responsibilities. We found this to also be true for NR sectors. Gender-specific barriers tend to interact with gender-intensified barriers in influencing women's decisions to leave these sectors. An example that was presented frequently by key informants for this study was the double standard women faced when they returned to work after parental leave. While men who took parental leave were welcomed back to work and often valorised for their commitment to parenting, women were more likely to find their commitment to work being implicitly or explicitly questioned, to be taken less seriously by colleagues and superiors, and to feel that they were no longer competitive or competent in their positions. This was especially true for women who had taken multiple parental leaves. In MiHR's 2016 study of women in mining, 25% of those who had taken parental leave indicated that it had a negative effect on their careers; only 3% indicated that it had a positive effect on their careers. While there were significant differences between the public and the private sector in accommodating employees' caregiving needs, it is important to note that the tendency for women not to remain in NR sectors after taking more than one maternity leave was reported by both public and private sector employees. Since public sector organisations in Canada have excellent practices for retaining and promoting women, including flexible work hours, telecommuting or working part-time, and extended maternity leave, these should theoretically enable women to leave, rejoin and hit the ground running, but there may be other gender-specific (not being taken seriously) and gender-intensified (low wages and cost of childcare) factors at play that influence the decision to leave. This may explain why women without caregiving responsibilities and those who enter work at a later stage in their lives, after completing parenting roles, are more likely to remain in these sectors.

There is clear evidence in the literature that perceptions of workplace culture affect recruitment and retention. For example, MiHR (2016) recently explored women's experiences in mining as well as their satisfaction and career plans. The results showed that women still perceive mining work environments as sometimes more “macho” than modern; the industry as an “old boys' club” where women can never be full members; and day-to-day interactions as often a series of micro-inequities that gradually wear women down. The women in MiHR's research sample were more likely than men to expect to leave the sector within the next five years; more than one-third of the women said it was “likely” or “very likely.” The research findings suggest that with respect to gender inclusive workplaces, the mining industry is a sector in transition—while many barriers to the inclusion of women are gradually being lowered, progress is slow and inconsistent across the industry. Although most of the research participants reported that times were changing, nonetheless many workplaces and career paths remained relatively traditional with subtle dynamics that made it difficult for women to advance. While blatant examples of discrimination have been reduced, more subtle influences, such as micro-aggressions or unconscious biases, continue to pose challenges to creating fully inclusive workplaces in NR sectors (Hughes, 2012).

The barriers to women's participation and advancement in these sectors are persistent but they may not be intentional. Once employers become aware of them, there is potential to change them. As an example, in the *Ramp-*

Up report prepared by Women in Mining and MiHR (2010), most mining employers did not perceive workplace culture as a barrier to women's employment in mining. By contrast, in 2015, mining employers surveyed by MiHR noted "workplace culture" and "gender-friendly workplaces and equipment" as being particularly important factors to facilitate women's employment in the industry.

3.2.2 | Masculinist work cultures and working conditions

Much of the existing literature refers to masculinist work cultures, sexism, and rampant sexual harassment as barriers for recruiting and retaining women, particularly in fieldwork and operations in NR. Mining, for example, is often described as a difficult and dangerous occupation that requires brute strength, risk-taking and toughness. The concept of hegemonic masculinity is at play in environments where men are expected to be macho and refrain from all things unmanly. In a study of mining in the Yukon, the enclosed and dangerous environments of mining were described by the participants in their study as creating solidarity between workers, where they had to trust fellow crewmembers with their lives (Jones & Southco, 2015). If women were assumed not to be tough enough to handle the nature of the work, they would inevitably be distrusted, isolated, and perceived as liabilities. To improve women's experiences in these sectors, individual masculinist practices as well as institutional and corporate structures must be questioned and reformed as they clearly influence and reinforce one another. Some of our interviewees had worked both in office and field settings in NR. They emphasised that women experienced isolation, mockery, and sexual harassment much more often in field and camp settings than in office-based settings.

Research on employment and social equity indicates that a workplace must have at least 15% women to reduce the minority effect, and ideally aim for 30% to obtain demonstration effects of critical mass (Abrahamsson et al., 2014). Women are burdened in multiple ways in industries where they are severely under-represented but treated as "change agents," that is, when they are expected to lead the way in changing entrenched work cultures. As an example, research conducted in fly-in fly-out (FIFO) mines revealed that executives wanted at least a few women to be present at mine sites because there would be no "civilising effect" upon male miners if there were no women on the worksite. Thus, women in mining face the predicament of being considered too sensitive, delicate, or feminine for the work involved while simultaneously often being included in tokenistic ways for possessing those same qualities. Therefore, it should not be surprising that many women in NR sectors "act like men" and end up reinforcing the masculinist system that is causing them harm to begin with. Senior professional women who interviewed for this research and held technical positions in geology and engineering remembered being told repeatedly by male colleagues, especially in the 1980s and 1990s, not just that they had been hired only because they were women but also that they had taken good jobs away from "deserving men." When these women were asked if they had any advice for young women who wanted technical careers, they (unsurprisingly) recommended "growing a thick skin and strong gut" to survive and move up the ranks.

A study of women coal miners in central Appalachia emphasises that mining workplaces are "based on male bonding, homo-socialisation, as well as identification and exclusion of 'others' (e.g., women, office staff, and management)" (Tallichet, 2006). In a similar vein, a study about gender diversity in mining produced by the Lulea Institute of Technology in Sweden notes "miner masculinity functions not only as a gatekeeper towards women and as an obstacle to gender equality interventions but it also preserves normative and problematic masculine traits" (Abrahamsson et al., 2014). Hostility in workplaces can drive women out or make them feel isolated, especially if they are the only ones or one of very few women on their teams. The negative perceptions women have about careers in mining can become self-fulfilling prophecies. The existing gender imbalance discourages women from considering a career in mining. And this creates a self-perpetuating cycle whereby women avoid mining because there are not enough women in mining.

MiHR reports that nearly one-fifth of women in mining have experienced harassment on a regular basis while working in a field setting. Women working on mine sites have frequently expressed safety concerns.

Isolated incidents like the discovery of a hidden camera in the women's washroom of Ekati Diamond Mine in the Northwest Territories have ensured that women working on mine sites express far higher levels of concern about safety than workers in other NR sectors. The camera in question was later held in a manager's office for safekeeping until security could arrive but it went "missing" by the time they got there (Malbeuf, 2017). Women are not just made to feel unsafe because of such incidents but also led to believe that management does not care much about their safety or comfort and may in fact not want them there at all. The notion that "men will protect men" was repeated frequently by key informants who had worked in field environments in mining although there were notable differences reported between small and large mining companies in attitudes toward sexual misconduct or harassment. Bigger mining companies were less tolerant of such behaviour than smaller companies.

A review of gender and diversity in mining in industrialised countries, including Canada, found that strategies like openly displaying pornography have been used by male miners in multiple locations to harass women and/or to force them to quit their jobs. In one instance, the images were ordered removed by management, but the walls and ceiling were repapered with pornographic images soon after by the same miners. Women wanted the images removed but did not want to be labelled oversensitive or difficult by managers. They also felt solidarity with the male miners over other aspects of worker and management relations. This made it difficult for women to speak up (Abrahamsson et al., 2014). Frequent experiences of overt sexism and micro-aggression are serious health and safety issues and they play a role in eventually motivating women to leave.

Forestry is also understood as "hard, outdoor labour that is dirty, dangerous and ultimately masculine." Researchers have argued that the Canadian forestry industry is dominated by "a masculine gender order that separates men and women and favours male workers in general" (Varghese & Reed, 2012). The historical roots of such understandings can be traced back to when only men held high-earning forest jobs and women generally did not work outside the home. Further, as forests can be privately owned, much of women's historical exclusion comes down to the ownership, socialisation and transfer of knowledge and skills from father to son in private ownership situations (Brandth & Haugen, 2000). Ninety percent of forests in Canada are publicly owned. This may explain why there is greater gender equity in public forestry than in private forest companies.

Masculinist workspaces isolate and marginalise women in ways that make them feel that they are always being watched closely and that the other workers are waiting for them to fail and be proven incompetent. As one female forester in Australia emphasises, "You have to prove yourself. As a woman working in forestry you have to prove yourself all the time, you have little margin for error, you have to be much better at your work than the boys" (Buchy, 2001). Moving up the ranks of such organisations is especially challenging for women. They must either accept that they will never do as well as men or start behaving exactly like men. Speaking about her experiences of working in mining in Canada, a female miner notes:

We have to be able to work the network like guys. This is still really challenging for women. The upper circles are really tight. Now the industry is recruiting women who act more like men—tough as nails. Overall, ambitious white males fit well ... it is difficult to manage up and network with superiors as a female because of the concern over perception of motivation—especially when all the superiors are male (Women in Mining, 2016).

Career advancement was identified repeatedly as an obstacle for women, particularly in technical positions, skilled trades, and senior leadership roles. Women can also feel socially excluded in a male-dominated environment, finding themselves not invited to networking and team-building opportunities, such as company fishing trips or golf tournaments. While such oversights may be unintentional, exclusion affects the working culture and minimises women's contribution to the organisation. One important distinction for employers interested in building more inclusive workplaces is to remember the difference between "tolerating" difference and "welcoming" or leveraging it. Treating everyone the same, or ignoring differences, has been found to be ineffective for achieving the benefits that are possible through having a diverse workforce. Often referred to as "The Platinum Rule," as opposed to the Golden Rule, the call to employers working with diverse groups is to "Treat others as you would want to be treated."

3.2.3 | Inflexible work schedules and work-related travel

Employment in these sectors often requires significant travel and time away from home. This can be challenging for all workers, but women with caregiving responsibilities, especially for young children, may be put at a particular disadvantage. The locations of large energy, mining and forest projects tend to be determined in part by the geography of NR and are often in remote isolated areas, with no provisions for the families of workers. As one key informant working for MiHR put it, “You can’t move the mine. Flexible hours and other arrangements that work in other industries are harder to implement in mining.” Such limitations may at least partially explain women’s severe underrepresentation in the oil and gas sector. There are several ethnographic accounts of Canadian women engineers and geologists in Calgary-based petroleum companies (Miller, 2004) as well as in emerging non-conventional sources such as tar sands, shale, and tight gas (Wood, 2013). Similar factors affect women’s retention in forestry. Forestry programmes in universities and technical colleges across Canada have been very successful in recruiting women but retention is a far bigger problem. A policy analyst for the Canadian Forest Service explains:

Early career women who do not have family responsibilities are often fine doing field work, but once they have family responsibilities, careers in forestry becoming challenging. Registered Professional Forester jobs are still stable and manageable, but fieldwork is very hard to reconcile with family. Provincial, territorial, and municipal forestry jobs are much more stable for schedules and job location. The private sector requires you to go where the work is, which is much harder for women. We’ve been trying to create more welcoming and safer camp environments for women for a while now.

It is important to remember, though, that although such factors may, to some extent, explain women’s underrepresentation in NR sectors, many women may already work in less-than-optimal environments for much less pay than they would make in NR industries. Given the option, some women would probably prefer work in NR simply because of the potential to earn higher wages. Due to persistent (often unintended or unconscious) male-biased norms in these industries, even women who may be able and willing to work may not be given the option to choose between difficult or dangerous working conditions with low pay and similar conditions with higher pay (McKee, 2014). Instead, women are assumed not to want to work in jobs classified as “difficult” or “dangerous” and tracked into “safe” feminised occupations in administrative and support services within NR industries. The fact that women’s careers can be adversely affected by “benevolent sexism” has also been documented in other sectors of employment (Dizik, 2016).

Infrastructure to support family life, including on-site day care services, recreation centres and medical facilities, as well as more flexible work schedules are what women repeatedly cite as factors that would influence their decision to work in NR. There is some recent evidence of employers responding in meaningful ways to women’s needs. For example, Savanna Energy Services has been actively recruiting female crewmembers for their rigs, with 10 to 16 women working in the field. When the company’s first female rig worker became pregnant, her position was changed to driving a crew truck because it was less physically strenuous than rig work (Fattori, 2014). This flexibility is indicative of how companies can accommodate women so that their careers are not disrupted or replaced altogether. “When you’ve invested in a person, you don’t want to throw that away,” says Laura Koronko, diversity coordinator for Savanna Energy Services. “Really, it’s no different than hiring men. We try to make it a good fit, whether it’s a woman, an aboriginal [sic] person or an immigrant. Not only do we want to broaden our employee pool, we also want to be seen as a leader in the industry and a company that is progressive.”

3.3 | Promotion, advancement, leadership

The challenges of recruiting and retaining women (at least up to the ranks of middle management) are gradually being addressed in NR sectors, but there are still persistent barriers to addressing women’s dire underrepresentation in senior executive positions and on boards of directors of companies. Women’s underrepresentation in leadership

positions and on boards of directors is not unique to the NR sectors. It is an issue all industries are contending with, but the NR industries stand out because they rank far below most other sectors in Canada when it comes to representation of women in senior positions and on boards of directors.

The underrepresentation of women on boards and as executive officers has continued despite significant evidence generated around the world to support the fact that gender diversity in leadership is good for business. In its study of almost 22,000 firms across the globe, the Peterson Institute for International Economics discovered that a company with 30% women leaders can add up to 6 percentage points to its net profit margin, compared to other companies in the same industry (Noland, Moran, & Kotschwar, 2016). Another study conducted in 2015 by Women in Mining found that companies with more women board members, on average, outperform those with fewer women by 53% on return on investment, 42% on return on sales, and 66% on return on invested capital. Similar findings have emerged for women in executive positions—companies with higher percentages of women decision makers financially outperform their industry peers. Across the economy, the percentage of women corporate officers correlate positively with better financial performance (Catalyst, 2008, 2011). A 30% critical mass of women as executive officers and board members has been found to have the most positive impact on company performance.

An important distinction must be made between women's *representation* and *participation* as executives and board members. At lower than 15% female representation, it is not uncommon for women, because of their minority status, to be made to feel marginal and “invisible” in decision-making processes (Westermann, Ashby, & Petty, 2005). Establishing critical mass is important for creating more supportive institutional environments in which women can speak out on issues and concerns in the presence of colleagues.

At the current rate of change it will take until 2039 for the top 100 listed mining companies (globally) to reach this 30% threshold and until 2045 for the top 500 to do the same (Women in Mining UK, 2015). Our interviewees concur: “We're not going to make any difference if CEOs, executives and boards don't think or look any different.” Those interviewed for this study also concurred that the business case—higher profits if women are on boards—was the only reason boards of private corporations would change in the future. Another respondent who agreed that the industry would only diversify if it made business sense to do so added, “If you don't even think you have a problem, you're certainly not going to fix it.” Documenting and publicising the economic benefits of diversifying boards and senior leadership was frequently mentioned as the most useful strategy for convincing NR corporations to change.

On 31 December 2014, the securities commissions in seven provinces and two territories in Canada introduced changes requiring publicly traded companies to report on their gender diversity policies and the representation of women in board or senior executive positions. British Columbia, Alberta, Prince Edward Island and Yukon are the only provinces and territories that have not adopted these changes. This “Comply or Explain” approach requires companies to adopt mechanisms that consider the representation of women or explain the reason for not doing so. The regulations also recommend disclosure on other diversity criteria, namely, ethnicity/race, age, disability, religion, sexual orientation, and marital status. In 2017, of the 742 Canadian companies that disclosed the composition of boards, women held only 13% of total board seats, men held the remaining 87%. This represented a small decline (0.4%) of board seats held by women in 2016 (MacDougall et al., 2018).

The industries with the highest average number and percentage of women directors were Utilities & Pipelines, Communications & Media, Clean Technology and Financial Services. The same industries reported the highest average number and percentage of women executive officers. Mining and Oil and Gas (along with Technology) ranked lowest in Canada among different industries for women directors and women executive officers. Just 6.1% of seats on boards of directors of publicly traded Canadian energy companies are women; 93.9% are men. Between 2016 and 2017, the percentages of women on boards of oil and gas companies declined further from 10 to 7%, and in mining from 13 to 9.4%.

Looking more specifically at board membership by gender of the top 25 NR companies in the Toronto Stock Exchange (TSX) Index, Canada's benchmark composite index representing 250 companies, it appears that in 2015 only three companies (Potash Corp. of Saskatchewan, Goldcorp, Kinross Gold) had 30% representation of women on their boards. Three companies (First Quantum Minerals, Royal Gold and Canfor) had no women on their boards. First

Quantum Minerals and Royal Gold have since had two and one women respectively join their boards. Canfor, one of the largest forest products companies in the world, had an all-male board until June 2018, when one woman, Dianne Watts, joined the board. Most of these boards still lack any ethnic or racial diversity. Racialised women, Indigenous peoples, people with disabilities, new immigrants, and LGBTQ individuals are often even more poorly represented than white women on boards and in executive positions of Canadian NR companies. Key informant interviews for this study reinforced this finding. One respondent with three decades of work experience in the oil and gas industry remarked that the leadership in the corporate petroleum sector had always been “an all-white male” environment. The same respondent referred to women's attempts to break into the ranks of senior leadership in the oil and gas sector as more akin to “brick walls than glass ceilings.” She did mention that on the rare occasion that women were asked to step into senior executive roles, they may choose not to because “marriage mortality” rates for women in management were exceedingly high. While the stressful pace and demanding nature of work in upper management appeared not to have adverse effects upon men's marriages and family life, she emphasised that it had much more deleterious effects upon women's home lives. As the literature on leadership has frequently documented, women must often choose between demanding careers and functional family lives while men can expect to have both. Without transformative changes in gender relations, even the most progressive workplace policies and interventions may not adequately address such entrenched, often internalised, social constraints. That said, the respondents who felt strongly that demanding careers and functional marriages were incompatible for women were in their late 50s or early 60s. Data emerging from a younger demographic (below 24) in this study suggest that both young men and women may be equally interested in work-life balance and in pursuing careers that enable them to simultaneously have satisfying home lives. There is reason for cautious optimism that intra-household gender norms and expectations are shifting significantly for younger women and men.

3.3.1 | Targets and quotas versus “comply and explain”

There is often confusion about the difference between targets and quotas. Targets are specific measurable objectives, generally set by an organisation at their own discretion, with specific timeframes in which they must be achieved. Consequences for not meeting a target may be set and enforced as the organisation sees fit. Quotas are mandatory. Like targets, quotas are also specific, time bound measurable objectives, but are usually set externally by a body with authority to impose them on organisations (for example, Parliament). Establishing quotas usually includes setting penalties for failing to meet them. These are enforced by a body external to an individual company and are non-negotiable by individual organisations.

Despite glacial progress on women's representation, Canadian companies remain far more willing to adopt board diversity policies than to adopt quotas or targets for the proportion of women serving as directors or executive officers. In 2017, of the 790 companies that provided disclosure regarding the existence (or not) of a written board diversity policy, 264 (33.4%) had a board diversity policy. This represents an approximately 8.4% increase from 2015, when only 25% of those disclosing had, in fact, adopted such a policy. However, only 85 (10.7%) of the 792 companies that provided board diversity target disclosure in 2016 had adopted a target for women directors. Only 18 (2.3%) of the 769 companies disclosing adopted a target for women executive officers in 2016. Overall, results for Canada for 2017–2020 reflected few changes from previous years raising the question of whether a “comply or explain” approach will be enough to achieve progress in a timely manner.

Countries that have instituted mandatory quotas have achieved a higher level of representation of women on boards. In France, women held 37.6% of the board seats at the companies surveyed in 2016 by Morgan Stanley Capital International (MSCI), representing substantial progress towards its mandatory 40% quota requirement for 2017. In Germany, which has implemented a quota of 30% to be achieved by 2017, women held 26.7% of the board seats

in 2016, and in Norway, which requires that women make up 40% of the board, 39.3% of the board seats were held by women (MacDougall & Valley, 2017).

The proportion of women represented on boards in comply and explain countries is substantially lower. For example, in the UK, 25.5% of board seats of companies were held by women in 2016 (MacDougall & Valley, 2017). In Australia, there was an average of only 9% women directors on the boards of companies in 2016. In Canada, women currently hold 14.5% of all board seats among companies disclosing the number of women directors on their boards, although among the 60 largest companies, 26% of the board seats are held by women (MacDougall & Valley, 2017). Unless a significantly higher percentage of companies take meaningful action soon, there is a real likelihood that Canadian companies will be confronted with a legislative response that introduces mandatory targets for board diversity.

The evidence that targets make a difference is already available. McKinsey & Company and LeanIn.Org's (2015) three-year review of 118 companies and 30,000 employees found that companies with gender targets made the most progress in women's representation, while those without targets lost ground. Our interviews and previous research (Clancy & Feenstra, 2019) have confirmed that the idea of adopting gender quotas may be unappealing for many companies for reasons including the misperception that an individual hired under a quota scheme is hired not for their qualifications but because they represent a particular category. Our interviewees suggested that NR companies can deal with the aversion to quotas by implementing targets that are specific, challenging, aligned with the company's strategy for gender diversity, and elevated to the same levels as business targets for budgets and performance. They elaborated that targets should not be focused solely on the numbers of women in the workplace. They may also include qualitative measures or "new ways of working together"—such as more respectful interactions, inclusive meeting practices or flexibility in where and when some of the work gets done. Targets can also assess indicators that are positive for everyone—less absenteeism, reduced turnover, greater satisfaction measures on employee surveys.

Years of focused study on gender diversity across many industries has yielded another overwhelmingly consistent conclusion: the commitment of the most senior leader (such as the CEO or President) is the critical ingredient for diversifying organisations. For example, a Conference Board of Canada research study highlighted the difference between "passive" and "proactive" CEO support for gender diversity. And only "proactive" support was found to be sufficient (Orser, 2001). The Canadian public sector has already started to implement the practice of selecting "gender champions" from the ranks of senior administration. Private sector companies should also do so.

Because NR companies often do not have enough women within their organisations at high enough ranks to step into leadership positions, we asked key informants whether they deemed it appropriate to recruit senior professional women from outside NR sectors to fill executive positions. Although most respondents felt that there was a better demonstration effect when women who had worked their way up within a specific NR sector were selected for leadership positions in that sector, they simultaneously agreed that it was sometimes necessary to recruit for such positions from other industries. Although most respondents agreed that only individuals with intricate knowledge of specific NR industries could be optimally effective on boards, they simultaneously concurred that bringing in recruits from outside may be necessary until an adequate "senior female talent pipeline" is established within specific NR industries. Bringing in recruits from government or private sector to fill senior management roles could also bring in new ideas and leadership styles that benefit NR sectors.

4 | CONCLUSION

Despite promising examples of government, corporate and non-profit programmes and practices to optimise women's employment in NR, gender disparities and hierarchies persist. Women experience both "sticky floors and glass ceilings" in these sectors, meaning that their careers may never get off the ground because of persistent and confining stereotypes of feminised roles and moving up the ranks is also more challenging for women due to the

absence of role models and gender-balanced initiatives. There is a material and an ideological basis for gender inequality. Consequently, there are both proximate determinants (childcare challenges and need for flexible work schedules, as examples) and structural factors (gendered division of labour within families and communities and societal valorisation of paid work over unpaid caregiving) that interact with one another and impede women's entry, retention and advancement in NR employment. In the future, skills and worker shortages in these industries and the changing nature of work in NR (because of automation and artificial intelligence, for example) may create more opportunity and need to diversify the workforce.

REFERENCES

- Abrahamsson, L., Segerstedt, E., Nygren, M., Johansson, J., Johansson, B., Edman, I., & Akerlund, A. (2014). *Gender diversity and work conditions in mining*. Luleå: Luleå University of Technology.
- Asia-Pacific Gateway Skills Table. (2015). *Women in transportation careers: Understanding participation in Canada*. Vancouver: APGST.
- Bardekjian, A., Nesbitt, L., Konijnendijk, C., & Lötter, B. (2018). Girls talk trees: Women's experiences in arboriculture and urban forestry. Paper presented at the International Urban Forestry Congress 2018: Diverse in Nature, Vancouver, BC.
- Baruah, B. (2017). Renewable inequity? Women's employment in clean energy in industrialized, emerging and developing economies. *Natural Resources Forum*, 41(1), 18–29.
- Brandth, B., & Haugen, M. (2000). From lumberjack to business manager: Masculinity in the Norwegian forestry press. *Journal of Rural Studies*, 16, 343–355.
- Buchy, M. (2001). *Listening to women's voices in the Australian forestry workforce: You learn to cope and get on with things*. Canberra: Australian National University.
- Byvelds, C. (2016). *Women in science and technology at NRCan: A gender-based demographic analysis*. Ottawa: NRCan.
- Cardwell, M. (2013). Canada's forestry programs adapt to changing times. *University Affairs*. Retrieved from <https://www.universityaffairs.ca/features/feature-article/canadas-forestry-programs-adapt-to-changing-times/>
- Catalyst. (2008). *Advancing women leaders: The connection between women board directors and women corporate officers*. New York: Catalyst.
- Catalyst. (2011). *The bottom line: Corporate performance and women's representation on boards (2004–2008)*. New York: Catalyst.
- Clancy, J., & M. Feenstra. (2019). Women, gender equality and the energy transition in the EU. Retrieved from [https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608867/IPOL_STU\(2019\)608867_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608867/IPOL_STU(2019)608867_EN.pdf).
- Cohen, M., & Braid, K. (2000). Training and equity initiatives on the British Columbia Vancouver Island Highway Project: A model for large-scale construction projects. *Labour Studies Journal*, 25(3), 70–103.
- Dizik, A. (2016). Where are all the expat women? BBC Worklife. Retrieved from <https://www.bbc.com/worklife/article/20160929-where-are-all-the-expat-women>
- Egan, M. (2017). Young people don't want to work for oil companies. CNN Money. Retrieved from <https://money.cnn.com/2017/06/21/investing/oil-jobs-young-people/index.html>
- ESDC. (2018). *Input from the trades and apprenticeship division: Skills and employment branch*. Ottawa: Employment and Social Development Canada.
- Fattori, L. (2014). Women bring diversity and expertise to Canada's oil and gas sector. *Saskatchewan Oil Report*. Retrieved from <https://saskatchewanoilreport.com/women-bring-diversity-and-expertise-to-canadas-oil-and-gas-sector/>
- Ferroukhi, R., Renner, M., Nagpal, D., García-Baños, C., & Baruah, B. (2019). *Renewable energy: A gender perspective*. Abu Dhabi: International Renewable Energy Agency (IRENA).
- Frank, K., & Jovic, E. (2015). *National apprenticeship survey: Canada overview report*. Ottawa: Statistics Canada.
- Gaudelli, J. (2009). The greenest generation: The truth behind millennials and the green movement. *Advertising Age*. Retrieved from <https://adage.com/article/goodworks/truth-millennials-green-movement/136331>
- Government of Canada. (2018). *Budget: Chapter 5 – Equality*. Government of Canada: Ottawa.
- Greening, D., & Turban, D. (2000). Corporate social performance as a competitive advantage in attracting a quality workforce. *Business and Society*, 39, 254–280.
- Gunderson, M. (2016). *A baseline on youth employment in the NR sector: A data analysis*. Ottawa: NRCan.
- Harding, S. (1995). Just Add Women and Stir? In *United Nations Commission on science and technology for development, missing links: Gender equity in science and technology for development* (pp. 295–308). Ottawa: International Development Research Centre.
- Hill, N., Alook, A., & Hussey, I. (2017). *How gender and race shape experiences of work in Alberta's oil industry*. Edmonton: Parkland Institute.

- Hughes, C. (2012). *A study on the career advancement and retention of highly qualified women in the Canadian mining industry*. Vancouver: University of British Columbia.
- Jones, C., & Southco, C. (2015). Mobile miners: Work, home and hazards in the Yukon's mining industry. *The Northern Review*, 41, 111–137.
- Kazi, N. (2017). *Canada's quarterly NR wealth*. Ottawa: Industry Canada.
- Keck, J., & Powell, M. (2006). Women into mining jobs at Inco: Challenging the gender division of labour. In L. Mercier & J. Gier (Eds.), *Mining women: Gender in the development of a global industry, 1670 to 2005* (pp. 280–295). New York: Palgrave Macmillan.
- Little, M. (2005). *If I had a hammer: Retraining that really works*. Vancouver: UBC Press.
- MacDougall, A., & Valley, J. (2017). Diversity disclosure practices: Women in leadership roles at TSX-listed companies. Retrieved from <https://www.osler.com/osler/media/Osler/reports/corporate-governance/2019-Diversity-Disclosure-Practices-Women-in-leadership-roles-at-TSX-listed-companies.pdf>
- MacDougall, A., & Valley, A. (2018). Diversity Disclosure Practices: Women in leadership roles at TSX-listed companies. Retrieved from <https://www.osler.com/osler/media/Osler/reports/corporate-governance/2018-Diversity-Disclosure-Practices-Women-in-leadership-roles-at-TSX-listed-companies.pdf>.
- Malbeuf, J. (2017). 'Hey gorgeous': Meet 2 women sick of sexism and discrimination in mining. *CBC News*. Retrieved from <https://www.cbc.ca/news/canada/north/mining-industry-sexism-1.4247363>
- Martz, D., Reed, M., Brueckner, I., & Mills, S. (2006). *Hidden actors, muted voices: The employment of rural women in Saskatchewan forestry and agri-food industries*. Ottawa: Status of Women Canada.
- McKee, L. (2014). Women in American energy: De-feminizing poverty in the oil and gas industries. *Journal of International Women's Studies*, 15(1), 167–178.
- McKinsey & Company and LeanIn.Org (2015). Women in the workplace. *Lean In*. Retrieved from <https://leanin.org/news-inspiration/women-in-the-workplace-2015>
- MiHR. (2015). *Canadian mining industry employment, hiring requirements and available talent: 10-year outlook*. Kanata: Mining Industry Human Resources Council.
- MiHR. (2016). *Strengthening mining's talent alloy: Exploring gender inclusion*. Kanata: Mining Industry Human Resources Council.
- Miller, G. (2004). Frontier masculinity in the oil industry: the experiences of women engineers. *Gender, Work and Organization*, 11(1), 47–73.
- National Women's Law Center. (2014). *Women in construction: Still breaking ground*. Washington, DC: NWLC.
- Nelson, J. (2015). Mining's untapped resource: Goldcorp seeks more women for work force. *The Globe and Mail*. Retrieved from <https://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/minings-untapped-resource-goldcorp-wants-more-women-in-its-work-force/article23352076/>
- Ng, E., Schweitzer, L., & Lyons, S. (2010). New generation, great expectation: A field study of the Millennial generation. *Journal of Business Psychology*, 25, 281–292.
- Noland, M., Moran, T., & Kotschwar, B. (2016). Is gender diversity profitable? Evidence from a global survey. Retrieved from <https://www.pii.com/publications/working-papers/gender-diversity-profitable-evidence-global-survey>
- NRCan. (1998). *State of Canada's forests*. Ottawa: NRCan.
- NRCan. (2016). *By the numbers: Gender diversity in Canada's NR industries and Science, Technology, Engineering and Math (STEM)*. Ottawa: NRCan.
- Orser, B. (2001). *Chief executive commitment: The Key to Enhancing Women's Advancement*. Ottawa: Conference Board of Canada.
- PetroLMI, 2017. workforce insights: impacts of the oil and gas downturn on the future and attitudes of workers. PetroLMI. Retrieved from https://careertransitions.ca/wp-content/uploads/2019/05/Workforce_Insights_2017_FINAL.pdf
- PwC (2008). Millennials at work: Perspectives from a new generation. Retrieved from <https://www.pwc.com/co/es/publicaciones/assets/millennials-at-work.pdf>
- PwC (2015). Mining for talent—a review of women on boards in the mining industry 2012–2014. Retrieved from https://www.bc-ctem.ca/sites/default/files/mining-for-talent-final-report-2013_0.pdf
- Sponagle, J. (2018). #MeTooMining digs into sexual harassment, assault in mining industry. *CBC News*. Retrieved from <https://www.cbc.ca/news/canada/north/metoo-mining-yellowknife-sexual-harassment-geologist-1.4576029>
- Tallichet, S. (2006). *Daughters of the mountain: Women coal miners in central appalachia*. University Park, PA: Penn State University Press.
- Teske, E., & Beedle, B. (2001). Journey to the top—breaking through the canopy: Canadian experiences. *The Forestry Chronicle*, 77(5), 846–853.
- Turnbull, P. (2013). *Promoting the employment of women in the transport sector: Obstacles and policy options*. Geneva: ILO.

- Varghese, J., & Reed, M. (2012). Theorizing the implications of gender order for sustainable forest management. *International Journal of Forestry Research*, 2012, 1–11. <https://doi.org/10.1155/2012/257280>
- Westermann, O., Ashby, J., & Petty, J. (2005). Gender and social capital: The importance of gender differences for the maturity and effectiveness of NR management groups. *World Development*, 33(11), 1783–1799.
- Women in Mining (2016). Welcoming to women: an action plan for Canada's mining employers. Retrieved from <https://wimcanada.org/wp-content/uploads/2017/01/WIM-NAP-book-full.pdf>
- Women in Mining and MiHR. (2010). *Ramp-up: A study on the status of women in Canada's mining and exploration sector*. Kanata: Mining Industry Human Resources Council.
- Women in Mining UK. (2015). *Mining for Talent 2015: A review of women on boards in the mining industry 2012–2014*. London: Women in Mining.
- Wood, L. (2013). Success, sex, and morality in the tar sands. *Vancouver Observer*. Retrieved from <https://www.vancouverobserver.com/environment/success-sex-and-morality-tar-sands>

How to cite this article: Baruah B, Biskupski-Mujanovic S. Navigating sticky floors and glass ceilings: Barriers and opportunities for women's employment in natural resources industries in Canada. *Nat Resour Forum*. 2021;1–23. <https://doi.org/10.1111/1477-8947.12216>