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# Implementation of California’s Troubled Zero Emissions Vehicle Mandate: A Review of Push-Pull Theory and Existing Circumstances

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## ABSTRACT

California’s 2035 Electric Vehicle Mandate essentially required that all new vehicle sales must be all-electric. Subsidy funding from California for consumers was generally limited and came from cap-and-trade revenue allocations. California’s process is what business management scholars characterize as a “Push” strategy. For California this manifested as: 1.) put even more taxes or cap-and-trade revenue dollars against the effort and, 2.) “push” even more with legislated mandates. The lingering overarching questions continuing to this day consider if this approach is working and, if not, should another approach be considered? The authors’ intent is to project in the simplest terms whether California’s current path will meet their stated goals. As a natural extension of this analysis, California’s “Push” strategy will likely not achieve the success, and should they consider another management strategy? Evidence was gathered, as much as practicable, using the state of California’s own data and other sources related to consumer buying habits for the various demographic consumer groups identified. Simple projections made in Excel over the mandates time-period, ending in 2035, looked to see what the economic implications would be for the various demographic groups and how that would logically affect their participation and therefore mandate goals’ success. The main findings strongly suggest that the lower economic demographic that makes up approximately 40% of the population have been and will continue to be resistant to participate in EV purchases. In addition, insufficient infrastructure (i.e. enough chargers and in the right locations) is an impediment to all demographic groups. The costs to meet the mandate both practically and economically are too high for California to get the participation rates needed to meet its’ mandate goals. The “Push” management strategy employed by California is not likely to result in mandate goals being met. The authors believe California should pivot to a “Pull” management strategy which addresses the political, cultural, scientific, economic, and industrial concerns of all demographic groups.

**Keywords:** Climate change; Zero-emission; Battery electric vehicles (BEVs); Hybrid electric vehicles (HEVs); Plug-in hybrid electric vehicles (PHEVs); Push-pull theory

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## 1. INTRODUCTION

This paper is focused solely on California's difficulty in implementing its original 2035 zero emission mandate (the Original Mandate), pursuant to an executive order (EO), that all sales of brand-new vehicles must be zero emission (primary focus being all-electric) by 2035, now extended to 2045, and recent federal legislative actions which may effectively impede its enforcement.

Acting upon congressional approval that occurred on 12 May 2025 (Lazo and Reyes Velarde, 2025), which included bipartisan support in the House, President Donald Trump signed three measures on June 12 that block California's mandates to phase out gasoline-powered vehicles and clean up diesel-powered trucks by 2025 (Lazo and Reyes Velarde, 2025). "Congress used the Congressional Review Act to revoke three waivers granted by the Biden administration to California to gradually eliminate gasoline powered cars and diesel trucks. Trump's signing made that official" (CalMatters Staff, 2025, para. 4). California quickly filed a lawsuit to counter Trump's actions. Ten other states joined the lawsuit. Governor Newsom also directed the California Air Resources Board to draft a new mandate (CalMatters Staff, 2025).

The apparent motivation by Trump involves an allegation that California's clean vehicle, emission standards, and Battery Electric Vehicle's (BEV) 2035 Original Mandate affects national new vehicle production and related consumer choice. "We officially rescue the U.S. auto industry from destruction by terminating California's electric vehicle mandate," Trump said at the White House. "And they're never coming back" (CalMatters Staff, 2025, para. 3). He said the state's zero-emission car "phase-in" has been a disaster for this country (CalMatters Staff, 2025, para. 3). Of critical note is the extremely fluid nature of not only California's EV policies and any future related details surrounding them, but California's overall "green energy" policies as well. Data and policy analyses in this paper are primarily based on events and circumstances through 31 August 2025, with minimal mention of the very recent EV mandate extension to 2045, which has scant information and details presently.

Predicting the outcomes of the various related lawsuits is difficult as multiple factors of a legal nature are in-play. Of issue is the age-old premise of states' rights versus federal control. It is unknown at this time if federal revocation of vehicle emissions waivers, which previously allowed states such as California, to enact more strict standards than federal ones, will prevail throughout the court system. As is the case with many of Trump's actions, lower courts may rule against his actions, but appeal courts and the Supreme Court may uphold them. What could impede this countersuit by Newsom is the fact that the US Congress, on a bi-partisan basis, approved legislation to block the waivers granted administratively by the Biden Administration, and Trump merely signed the legislation versus issuing an executive order. Typically, legislation overrides executive orders. Because of this, despite recognition of a future unknown outcome, these authors tend to believe the Newsom suit will fail, and the waivers' revocation will prevail.

While the current BEV supply and demand environment, consumer range anxiety, including charging stations' infrastructure, and the aforementioned political landscape certainly present significant obstacles to any future EO or legislation revisiting such Original Mandate, these authors provide data/information relative to underlying issues that may influence such efforts. In particular, Push-Pull Theory was examined as a means for California to transition from a Push policy (the Original Mandate) to a Pull strategy, recognizing consumer concerns, which could involve more emphasis on building an adequate charging station infrastructure and addressing other factors that affect "range anxiety."

## 2. RESEARCH METHODOLOGY, QUESTIONS, AND PROPOSITIONS

The scholarly contribution of this article involves an original empirical analysis obtained from information in secondary data and a literature review. Data was gathered as much as practicable using the state of California's own data. This was enhanced from other sources related to consumer buying habits for the various demographic groups concerned. Simple projections made in Excel covering the mandate's time period, ending in 2035, looked to see what the economic implications would be for the various demographic groups and how that would logically affect their participation and therefore the mandate goals' success.

Using search engines from the Pfau Library at California State University San Bernardino, and Google Scholar, forty-six (46) references were obtained which were pertinent to this research endeavor.

Of that magnitude, forty-one (41) sources ranged from 2023 to 2025, because the focus of this research paper was on current data in a highly fluid environment. As such, thirty-one (31) of those forty-one (41) sources were from government and automobile association websites, including such organizations and associations like Cal Matters, the California Air Resources Board, and the California Department of Energy. Academic peer-reviewed sources are minimal regarding recent electric vehicle sales data and applicable government policy actions, hence the importance of this article. However, there were ten (10) academic sources of the forty-one (41) recent sources that were published in journals and included references in such sites as Science Direct, MDPI, and Emerald Publishing. Of the five (5) sources older than 2023, one academic source concerning range anxiety dated to 2009 and was included in the journal, Transportation Research and indexed in Science Direct; three sources ranged from 1966 to 2012, which addressed Push-Pull Theory and involved two books and one journal article from Transportation Research, referenced in Science Direct; and one source from 2022 involved electric vehicle affordability and was written by authors from the aforementioned Cal Matters.

Considering recent California legislative actions in consort with changes in federal policy regarding waivers for California's more restrictive vehicle emissions standards, one may question why market and range anxiety analyses are even applicable. These authors suggest that, while not precisely known as to the motivation for California's legislative and federal policy actions, the backdrop for lessening market acceptance of EVs and consumer range anxiety would generally influence legislative actions.

The research questions guiding this study are:

1. Does an analysis of current data and trends suggest California will be able to achieve 100% compliance with the "Original Mandate" for brand new zero emissions auto sales by 2035?
2. Based on current trends and ancillary data, will California have sufficient charging stations to facilitate the desired purchase demand for brand new zero emissions BEVs?

### 3. RESULTS AND DISCUSSIONS

#### 3.1 California Policies and Issues

The zero-emission vehicle requirement, which was to occur by 2035, was part of the Advanced Clean Cars Regulations (CARB, 2025a), meaning all new passenger cars, trucks, and SUVs sold in California must be zero-emission vehicles (generally all-electric with 20% Plug-in Hybrid Vehicles or PHEVs). Despite this mandate, gasoline cars could have been driven in California after 2035, provided they were registered with the California Department of Motor Vehicles and sold as a used car to a new owner (CARB, 2025b).

Programs enacted by California to facilitate and encourage conversion to clean energy vehicles include(ed):

1. Cap-and-trade (the primary funding mechanism) – 40% in discretionary allocations.
2. Clean Cars 4 All
3. Clean Vehicle Rebate Project
4. Clean Vehicles Assistance Program

Success of these programs in reducing greenhouse gases (GHGs) is apparently unknown or unquantified because the California Air Resources Board has failed to adequately measure it, according to an audit by the state's Legislative Analyst's Office (2024). Presently, the only programs remaining are Cap-and-Trade and Clean Cars 4 All, which have been combined with the previous Clean Vehicle Rebate Project (CARB, 2025a). Criteria for participation in the new combined program for all-electric vehicle purchases only (no hybrids) up to eight (8) years old, assuming such program and related criteria extend beyond 31 August 2025, or will be embodied in any new programs, include:

- \$10,000 purchase assistance subsidy and \$2,000 charging station subsidy (or pre-loaded charge card) for buyers with incomes less than or equal to 300% of the Federal Poverty Level.
- \$12,000 purchase assistance subsidy and \$2,000 charging station subsidy (or pre-loaded charge card) for buyers who reside in disadvantaged communities with incomes less than or equal to 300% of the Federal Poverty Level.

Because demand for electric vehicles among disadvantaged communities is negligible at best, for analysis purposes, these authors will only incorporate 300% of the Federal Poverty Level category, absent the disadvantaged community category.

While the Mandate appears in jeopardy, in light of federal actions, such action does not prevent the State from adhering to the Clean-Cars 4-All program or aspects of it. Incentives for purchasing BEVs or PHEVs may still be utilized. However, of critical note is the absence of independent incentives for turning in or scrapping an older vehicle and purchasing a hybrid, PHEV, or BEV (collectively, the term EV will be used forthwith) vehicle. One must do both. Presumably, the individual will be able to turn-in the gas guzzling vehicle and purchase the clean energy one at the same time, but that is unclear. If there is a gap between these events, this could leave the consumer without a replacement vehicle for an undetermined length of time. Data after 30 November 2023, relative to the new combined program, is largely unavailable, likely due to administrative issues/delays and communication to the public (CARB, 2025a).

Regarding annual income qualifications relative to 300% of the federal poverty level for 2025 (roughly at \$15,000 per person), that equates to \$46,950 for a single person household, \$63,450 for two persons, \$79,950 for three persons, and \$96,450 for four persons (HealthCare.gov, n.d.). For purposes of this paper, because the Census data categorizes family households as two plus, the income for three persons will be used, rounded down to \$75,000 to match Census categories.

Table 1: Federal Poverty Level (FPL)

<i>Family Size</i>	<i>Amounts</i>	<i>300% FPL</i>
For individuals (single)	\$ 15,650	\$ 46,950
For a Family of 2	\$ 21,150	\$ 63,450
For a Family of 3	\$ 26,650	\$ 79,950
For a Family of 4	\$ 32,150	\$ 96,450
For a Family of 5	\$ 37,650	\$ 112,950
For a Family of 6	\$ 43,150	\$ 129,450
For a Family of 7	\$ 48,650	\$ 145,950
For a Family of 8	\$ 54,150	\$ 162,450
For a Family of 9	+ \$ 5,500 per Person	+ \$ 16,500 per Person

Source: Adapted from Health Care.gov (2025). Note: \$79,950 will be rounded down to \$75,000 to match census data for use in analysis.

### 3.1.1 California's Implied Sales Ramp-up to Address the Mandate

Based on data from the California Air Resources Board (CARB, 2022) the following sales expectations for EVs (all technologies) from 2026 to 2035 have been developed. Implied by the “Totals” column are the percent (%) “ramp up” expectations between 2026 and 2035 to meet the “Original Mandate”.

Table 2: California Percentage Requirements for New Auto Zero Emission Sales, 2026 through 2035

<i>Year</i>	<i>BEV 300</i>	<i>BEV 400</i>	<i>PHEV</i>	<i>FCEV</i>	<i>Totals</i>
2026	31.40%	0%	3.30%	0.30%	35.00%
2027	39.40%	0%	3.30%	0.30%	43.00%
2028	45.30%	0%	3.90%	0.30%	49.50%
2029	46.80%	8.00%	3.90%	0.30%	59.00%
2030	48.00%	13.70%	3.90%	2.50%	68.10%
2031	48.00%	21.30%	3.90%	2.80%	76.00%
2032	48.00%	27.30%	3.90%	2.80%	82.00%
2033	48.00%	33.30%	3.90%	2.80%	88.00%

2034	48.00%	38.50%	4.70%	2.80%	94.00%
2035	48.00%	40.00%	9.20%	2.80%	100.00%

Notes:

- BEV 300 = battery electric vehicles with up to 300 miles of charging capacity. This capacity generally supports passenger vehicles and light duty trucks in commuting situations of a more urban nature and is limiting for rural drivers. Most vehicles presently on the market are 300 BEV which appears to limit consumer acceptance due to range Anxiety.
- EV 400 = up to 400 miles charging capacity. This capacity is more useful for rural drivers and larger cars and pickup trucks. It appears automobile makers need to make a transition to more BEV 400 vehicles and less BEV 300's.;
- PHEV = plug-in-hybrid electric vehicles, and
- FCEV = fuel cell electric vehicles
- All percentages in the above Table 2 come directly from CARB (California Air Resources Board), Table II-5, p.7, Public Hearing to Consider Advanced Clean Cars II Regulations, 25 August, 2022). [*Source: Adapted from CARB, 2022*]

The data in the following table 3 is derived from new car sales data from the California New Car Dealers Association, which sells approximately 1.8 million vehicles each year based on projected sales for 2025 and historical trends. This is then integrated with the previous table 3 from CARB, page 6 of the 2022 update. It is assumed that total sales will be flat until 2035. Multiplying the annual percentage sales expectations from table 3 by 1.8 million equals the implied yearly EV sales needs (all technologies) to meet the “ramp-up” for the “Original Mandate” (Table 4). If aggregate demand/sales are higher or lower than 1.8 million, the EV sales ramp-up per year (all technologies) will change proportionately.

Table 3: Assumed 1.8 MM New Light Vehicle Sales/Registrations per Year

<i>Year</i>	<i>Average Sales Estimates per Year</i>	<i>%/100 Sales Required to Meet Mandate (per Regulation)</i>	<i>BEV and PHEV Sales Needs</i>
2026	1,800,000	0.35	630,000
2027	1,800,000	0.43	774,000
2028	1,800,000	0.51	918,000
2029	1,800,000	0.59	1,062,000
2030	1,800,000	0.68	1,224,000
Sub-tot			4,608,000
2031	1,800,000	0.76	1,368,000
2032	1,800,000	0.82	1,476,000
2033	1,800,000	0.88	1,584,000
2034	1,800,000	0.94	1,692,000
2035	1,800,000	1	1,800,000
		Total BEV & PHEV Required Sold and Registered by 2035	12,528,000

Sources: Clegern & Young, 2022; California New Car Dealers Association, 2024

Note: Under the CARB ramp-up schedule, targeted New EV sales amount to a cumulative amount of 12,528,000 by 2035. However, it is conceivable, while unlikely, that California consumer demand and purchases of EVs could accelerate significantly in the later years of the schedule, meeting the Original Mandate expectations by 2035. For information purposes only, and not part of the ramp-up schedule, this table does not include an estimated base amount of new EV registrations amounting to 2,450,000 for 2024 and 2025 combined, which equals an overall estimate of 14,978,000 until 2035.

### 3.1.2 Affordability of Electric Vehicles – Availing Oneself of the Incentives

Given the new financial incentives in California’s Clean Cars 4 All Program (incorporates and modifies the previous Clean Vehicle Rebate Project), which exclusively includes households less than or equal to 300% of the federal poverty level, demand by this demographic regarding all-electric vehicles appears to be a challenge to the success of the “Original Mandate”. Lopez (2022) discusses affordability, both through data analysis and interviews with some California residents. A California Central Valley coalition of advocacy groups, regarding cleaner air, created an organization named the EV Equity Program. Maria Lopez, the supervisor of the program, stated markups of vehicle prices on electric vehicles add to an already existing issue of affordability. These markups are usually around \$15,000. As of 2022, new electric cars cost anywhere from \$25,000 to \$180,000. Many popular models were sold out with long waiting lists. Zhao (2022) states that 55% of all construction workers in California are Hispanic. Within that ratio, 14% are estimated to be undocumented. Holliman and Collins (2023) assert that the use of public transportation or electric passenger vehicles by those employed in the construction industry presents obstacles, because pickup trucks are the norm for workers in that industry. Fischer (2025) released information detailing new light-duty truck prices (starting price – minimal options), which ranged from a low of \$49,995 for a Ford F-150 Lightning to a high of \$86,645 for a GMC Hummer EV. Full options add an average of \$42,000 to these costs. Clearly, these prices are in the upper-cost strata as noted by Lopez (2022) and serve to further challenge the affordability of EVs by construction workers.

Since no statewide government sponsored data set exists that delineates car sales along demographic lines. Lopez and Yee (2023) performed a data set analysis of new vehicle registrations as maintained by the Department of Motor Vehicles. A summary of their findings states that “Communities with high concentrations of electric cars are affluent, college-educated and at least 75% white and Asian. In contrast, electric cars are almost nonexistent in Black, Latino, low-income and rural communities — revealing the enormous task that California faces electrifying the entire fleet” (Lopez & Yee, 2023).

Consistent with the National Gallup survey, Jones (2024) states, according to Cal Matters’ analysis as reported by Lopez and Yee (2023), the primary influence for EV purchases in California is income. In the top ten communities in California for EV ownership, most have median incomes exceeding \$200,000 versus the statewide average of \$84,000, and common home values in those areas exceed \$3 million per Zillow estimates. Conversely, electric cars are nearly non-existent in California’s lowest income communities: only 1.4% of cars in Stockton’s 95202 are electric, where the median household income is \$16,976, and 0.5% in Fresno’s 93701, where the median is \$25,905. Most are plug-in hybrids, which are less expensive (Lopez & Yee, 2023, para. 21). For purposes of this paper, an approximate 1.4% participation rate for low-income consumers will be assumed within the base amount of EV registrations as of 31 December 2025 (2,450,000 total for all consumers x 1.5% = 36,750). Exploring affordability further, if a household pursues incentives and finances an EV (new or used), they must be able to afford monthly payments. Table 5 provides a commonly accepted maximum monthly car payment amount based on pre-tax income.

Table 4: Estimated monthly car payment based on salary

<i>Annual salary (pre-tax)</i>	<i>Estimated monthly car payment should not exceed</i>
\$25,000	\$208 per month
\$50,000	\$416 per month
\$75,000	\$625 per month
\$100,000	\$833 per month
\$125,000	\$1,042 per month
\$150,000	\$1,250 per month

Source: Meyer (2023). Note: Annual household incomes below \$25,000 (pre-tax) per year are not considered in the table above.

Affordability is then a function of household income, subsidies (both State and Federal), and the ability to finance a purchase. Comparing demographics with subsidized new EV passenger cars and truck costs provides a window into the possibility of purchase for subsidy qualified lower-income groups in California.

Table 5: Affordability analysis for low-income qualifiers for assistance

<i>California Household Income Level per US Census Data</i>	<i>Car Payment Affordability (10% of Takehome Income)</i>	<i>Estimated Yearly Max Vehicle Payment Expenditure (72 Months at 6.75%) for Top Affordable Car Price *</i>	<i>Top Affordable Vehicle Price Based on Salary *</i>	<i>Likelihood of Purchasing New Zero Emission EV Passenger Vehicle Cost with Subsidies</i>	<i>Likelihood of Purchasing New Zero Emission EV Light Duty Truck Vehicle Cost with Subsidies</i>	<i>Number of Households</i>	
				<i>New Passenger Vehicle EV Cost (With Subsidies) \$17,429</i>	<i>New Light Duty Truck EV Vehicle Cost (With Subsidies) \$38,149</i>		
				<i>Buy/Might Buy/Not Buy</i>	<i>Buy/Might Buy/Not Buy</i>		
<i>Income Level:</i>							
Less than \$10,000	\$1000.00	\$1500.00	\$7384.00	Not Buy	Not Buy	657,591	
\$10,000 to \$14,999	\$1500.00	\$2244	\$11,076	Not Buy	Not Buy	410,994	
\$15,000 to \$24,999	\$2500.00	\$3756	\$18,459	Not Buy	Not Buy	712,390	
\$25,000 to \$34,999	\$3500.00	\$5244	\$25,843	Might Buy	Not Buy	739,790	
\$35,000 to \$49,999	\$5000.00	\$7500	\$36,918	Might Buy	Not Buy	1,123,385	
\$50,000 to \$74,999	\$7500.00	\$11,256	\$75,000	Might Buy	Might Buy	1,849,475	
						5,493,625	41% of 13,699,816 Households
			Not Buy =	1,780,975 (13% of Total Households)	3,644,150 (27% of Total Households)		
			Might Buy =	3,712,650 (27% of Total Households)	1,849,475 (13% of Total Households)		

Source: F&I Tools, 2025

\*Comparing “New Passenger Vehicle EV Costs with Subsidies” (Top Affordable Car Price Based on Salary) provided the Buy/Might Buy/Not Buy determinations shown.

\*Comparing “New Light Duty Truck EV Costs with Subsidies” (Top Affordable Car Price Based on Salary) provided the Buy/Might Buy/Not Buy determinations shown. Given current incentives the likelihood these lower socio-economic segments of California households will comply with the “Mandate” seem doubtful.

### *3.1.3 California Sales and Demand Data*

As a general comment, based on sources to follow, California's EV sales are increasing but not at consistent growth levels. Despite affordability statistics for low-income groups, the California Energy Commission (CEC, 2024) recently issued a press release reflecting a glowing and optimistic report concerning zero-emission vehicle sales and progress toward meeting state goals. This department asserts California has met its sales goals two years ahead of schedule. EV cumulative sales as of June 30, 2024 were 1,872,429, but appear to be flattening out at approximately 400,000 per year (CEC, 2024). These authors project 2024 year-end sales to be 2,000,000, and 2025 sales will be 450,000 as noted in discussions to come. Of note is the comment by Lopez and Yee (2023) that no official data set is maintained by California regarding the demographics of purchasers of new EV vehicles. The alleged encouraging information in the Energy Commission's press release does not address the income and related affordability gaps. The information released does not show any breakdowns by income, race, or geographic location.

The following provides some insight into the conflicting views of the current demand environment in California:

1. In mid-2024, the California New Car Dealers Association (2024) reported the growth rate of all electric vehicles in California dropped by 1.2% in the second quarter of 2024.
2. Likewise, the number of electric car registrations decreased from 102,730 in the second quarter of 2023 to 101,443 in the second quarter of 2024 (California New Car Dealers Association, 2024).
3. Sales of electric cars declined for the first time in ten years in the final quarter of 2023, despite surging in the first six months of 2023 (California New Car Dealers Association, 2024).
4. Recorded sales for the fourth quarter 2023 were 89,933, a decline of 10.2% (California New Car Dealers Association, 2024).

Somewhat contrasting the above, a November 10, 2024, report by Anderson (2024) of CARSCOOPS, based on data sourced from Experian Automotive, indicated:

1. Dramatic increases in market share from 2020 to 2023 year-end for all categories (EV, PHEV, and HEV) but fluctuating market share data from the third quarter of 2023 to the third quarter of 2024.
2. Comparison of the third quarter of 2023 to the third quarter 2024 indicates fluctuating data with both slight increases in market share and slight decreases in market share.

Furthermore, as noted by Anderson (2024) and more salient for purposes related to this paper:

1. The average quarterly EV registrations were 111,412 per quarter from the third quarter of 2023 to the third quarter of 2024, or 445,648 registrations per annum.
2. A slight increase in the second quarter registrations of 2024, (116,166), and the third quarter of 2024, (116,179).

Based on the above information and for purposes of this paper, annual growth is expected to be 450,000, assuming no change in demand and purchases by lower-income households.

### *3.1.4 Likelihood of Meeting the "Original Mandate" – EV Purchases*

Comparing EV (all technologies) purchases based on annual new vehicle sales of 1.8 million per year with the implied "ramp up" from CARB (2022) and Clegern and Young (2022), and contrasting that with calculated projected anticipated new vehicle EV (all technologies) registrations between 2026 and 2035 based on Anderson's (2024) findings, results in table 6.

Clearly, 450,000 new vehicle EV registrations each year falls short of the 1.8 million required under the "Mandate" as we have defined it, and the "ramp up" to 4.5 million cumulative new EV sales is less than half of the 12.5 million anticipated by the implied "ramp up" schedule. Considering the estimated 2,450,000 new EV registrations for 2024 and 2025 combined, this amounts to 14,952,000 estimated cumulative registrations by 2035 per the CARB ramp-up and 6,950,000 total registrations per these authors' estimates. The difference remains at an 8,002,800 deficiency.

Table 6: Projected New EV Registrations

<i>Consistent Year on Year Flat Demand</i>					
<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
<i>Year</i>	<i>Current Annual Sales</i>	<i>CARB Ramp-up % Required</i>	<i>CARB Required EV Sales "Ramp up"</i>	<i>Based on Flat Demand Per Anderson (2024)</i>	<i>Based on Flat Demand Deficit/ Surplus to CARB Req (E-D)</i>
2026	1,800,000	35.00%	630,000.00	450,000	(180,000.00)
2027	1,800,000	43.00%	774,000.00	450,000	(324,000.00)
2028	1,800,000	49.50%	891,000.00	450,000	(441,000.00)
2029	1,800,000	59.00%	1,062,000.00	450,000	(612,000.00)
2030	1,800,000	68.10%	1,225,800.00	450,000	(775,800.00)
2031	1,800,000	76.00%	1,368,000.00	450,000	(918,000.00)
2032	1,800,000	82.00%	1,476,000.00	450,000	(1,026,000.00)
2033	1,800,000	88.00%	1,584,000.00	450,000	(1,134,000.00)
2034	1,800,000	94.00%	1,692,000.00	450,000	(1,242,000.00)
2035	1,800,000	100.00%	1,800,000.00	450,000	(1,350,000.00)
		Totals ----->	12,502,800.00	4,500,000.00	(8,002,800.00)

Sources: CARB (2022), Clegern & Young (2022), Anderson (2024)

### 3.2 National (US) Sales and Consumer Demand Data

Currently, less than 6% of Americans own electric vehicles. Most Americans still prefer to buy gasoline powered cars or if they are looking for an alternative, they favor hybrids over all-electric (Sherk & Sagert, 2023). While the cost to charge is relatively less than a tank of gas, the overall cost to purchase an electric vehicle is substantially more. One study found that 1/5 of all electric car owners in California returned to gas-powered because of convenience (Sherk & Sagert, 2023). Despite this criticism, as reported in Bloomberg, Randall (2023) states all-electric sales in the US were increasing dramatically between 2011 and 2023, taking ten years to reach its first one million in sales (2021) but only two years more (2023) to attain three million. California and Tesla are cited as the primary contributors for EV sales with California accounting for 39% of all sales and Tesla accounting for 61% through 2023 (Randall, 2023). According to Hickey (2024), US automobile dealers are concerned about inventory issues, particularly considering Tesla’s historic dominance, although this company’s market share dropped to 61% in 2023 from 80% in 2022. Competition includes new entrants such as the Volkswagen ID.4 at 3.4%, Chevrolet Bolt EUV at 2.8%, and Ford Mustang Mach-E, at 2.9%. Hickey (2024) further reports a decline in EV sales of 15.2% during the last quarter of 2023, as compared to the last quarter of 2022, and a decline of 2.2%, as compared to the first quarter of 2023. This data may negate a continued positive trend line.

Gallup (Jones, 2024) published poll results on April 8, 2024, that largely substantiate the somewhat flat to downward trend in EV marketplace acceptance as follows. Noteworthy, however, are the Gallups’ findings from US residents (Table 7) regarding climate change and how those potential concerns affect future demand for EVs. An interesting finding from this survey is that even among those who “are very worried” about climate change a third would not buy. The largest percentage that would not buy are households making less than \$40,000 per year, and results from all households, regardless of income or climate change concerns, indicate an increase in “would not buy” from 41% in 2023 to 48% in 2024. It is fair to note that these graphs represent national trends and are not broken out by state, and it would be entirely possible that California would skew more in favor of EV purchases. Furthermore, the preferences among national households (which include California) shift throughout time periods and are likely influenced by government subsidies, EV purchase prices, and both charging time and driving range capacity which appear to be improving due to enhanced technologies.

Table 7: Summary of Gallup Findings Regarding Electric Vehicle Ownership

	<i>Currently Own</i>	<i>Seriously Consider Buying</i>	<i>Might Buy in Future</i>	<i>Would Not Buy</i>	<i>No Response</i>
<i>All Households:</i>					
2023	4%	12%	43%	41%	0%
2024	7%	9%	35%	48%	1%
<i>By Annual Household Inc.:</i>					
\$100K+	14%	11%	34%	41%	0%
\$40K - \$99,999		9%	40%	44%	7%
Less than \$40K		7%	29%	61%	3%
<i>Concern About Climate Change</i>					
Very Worried	8%	14%	43%	32%	3%
Somewhat	9%	8%	39%	42%	2%
Little or Not at All			23%	68%	9%

\*Note: Largest percentage of “Would not buy” for “Lower Income” segment. *Source:* Jones, 2024

Shifting to supportive infrastructure and concerns, some industry experts question the ability to support the desired growth in EVs (IER, 2023). At current rates and even with \$7.5 billion in funding from the federal Inflation Reduction Act (IRA), there is still a shortage of millions of available charging stations. If the needed ramp up of charging stations were to occur, the expansion would likely create an increased burden on the current electrical grid so upgrades will have to be made there as well<sup>1</sup>(IER, 2023).

The overall takeaway is that the appetite for the adoption of EV is, in general, not close to unanimous or strong across all socioeconomic levels. The next section focuses on data, programs, and issues generated by California sources or matters generally applicable to California only.

### 3.3 Range Anxiety

Early in the advance of the electric vehicle market, Sovacool and Hirsch (2009) reported on various factors that inhibit the spread and acceptance of battery electric vehicles. Of paramount concern was range anxiety, which is defined by Neubauer and Wood (2014) as a negative sensation related to a combination of insufficient battery range capacity and limited charging station availability. As a result, range discussed in the literature becomes a major obstacle to EV market acceptance. More recent information supports the continued applicability of range anxiety. Mazda North American Operations (2025) provides similar definitions as previously indicated and describes three top conditions that cause it:

1. EV range – the belief that electric vehicles have limited driving ranges (Mazda somewhat refutes this concern by stating that range typically exceeds the daily round-trip commute).
2. Concerns about charging times and infrastructure – even if a driver gets to a charging station before the battery runs out of "charge", he may be worried about the amount of time it takes to charge the battery.
3. Lack of familiarity with charging stations and charging mechanics – new EV drivers encounter a learning curve that necessitates a certain amount of education to become more comfortable with the charging station experience.

Mildner (2023) also postulated three reasons for range anxiety that largely mirror those of Mazda North American Operations:

1. EV driving range is not sufficient – related to daily average commuting distances. Mildner echoes the Mazda assertion that charged battery capacity is generally sufficient – up to two

charges per week are usually adequate for US commuters and only one charge per week for Europeans.

2. Lack of public infrastructure -- To help alleviate range anxiety, the adequacy of public chargers is paramount since many commuters/drivers cannot charge at home or at the workplace. “Consumers increasingly expect the same services, simplicity and autonomy for EVs as they do for conventional vehicles (Mildner, 2023, para. 7).
3. Lack of public fast charging – Mildner concludes there is insufficient fast charging infrastructure across longer distance motorways.

As a result of the literature and ancillary information, these authors conclude that range anxiety in the adoption of EV market acceptance is a real and present phenomenon. The following is more detailed information regarding charging station availability in California and EV charging capacity:

### 3.3.1 Electric Vehicle Charging Stations – Concerns Across All Socio-Economic Levels

A significant issue relative to the 2035 Original Mandate is the availability and logistics of electric vehicle charging stations. Lopez (2022) determined that for every 10 new EV registrations, 1.5 charging stations need to be added.

Table 8: Electric Vehicle Chargers in California

<i>Year</i>	<i>Increase</i>	<i>Cumulative</i>
2019	41,947	41,947
2020	28,532	70,479
2021	8,544	79,023
2022	8,684	87,707
2023	17,305	105,012
Audit Adjust		105,012
Correction	35,554	140,566
2024	37,983	178,549

Source: California Energy Commission, 2024

Notes: For periods prior to 2024, per an audit adjustment, the amounts were understated by a cumulative total of 35,554. This error/adjustment skews reliable trend analyses.

Currently, public charging stations are largely located in urban areas, principally along the western area of the State near the coastline. Updated data from the California Energy Commission, as of August 26, 2024, indicates there are 178,549 charging stations in place, of which 84,271 are public and 94,278 are private. However, we can project the number of necessary charging stations to accommodate the Lopez (2022) estimate of 1.5 new charging stations for every 10 new EV’s registered:

1. Per table 7, based on these authors’ projected new EV sales from 2026 to 2035 of 450,000 per year, there will need to be 675,000 new charging stations in place (4,500,000 x .15).
2. Per table 7, based on the CARB ramp-up, if successful, there would have needed to be 1,875,420 charging stations in place (12,502,800 x .15).

If 37,983 newly added charging stations held constant until 2035, there would only be 379,830 new stations (37,983 x 10 years), falling far short of the necessary amounts per either of these authors projected new EV sales activity or the sales if the CARB ramp-up schedule materialized. Lusk et al. (2023) performed a quantitative study of low-to-moderate income consumer preferences for EVs on a national basis, as related to the availability of charging stations. Their findings indicate that upward of 90% of respondents would buy or lease an EV if the government subsidized the installation of charging stations at their residence or place of work. The timing of any such governmental endeavors and legislative support remains unknown currently.

Building more charging infrastructure in rural areas is also salient as residents tend to drive significantly more miles than commuters in areas with more infill. The types of automobiles likely used by rural drivers will require long-range charging capabilities (Lopez, 2022). How the state, private residences, and the private sector will fare in advancing the charging station infrastructure is unknown.

Given the recent California legislative and federal policy setbacks regarding the Mandate and flat to decreasing consumer demand for EVs, there does not appear to be any compelling evidence to suggest that substantial progress will be made in building an adequate charging station infrastructure in the near future.

### *3.3.2 BEVs - Range, Charging Time, Charging Cost, Battery Life, and Replacement Cost*

Per Edmunds (n.d.) driving range is of utmost importance to potential EV drivers. This salient concern also involves a significant aforementioned lack of EV charging stations, particularly when compared to the abundance of gasoline stations. Many newer EVs have a driving range over 200 miles, and some, like the Lucid Air Grand Touring, can go in excess of 500 miles. At the lower end of range capacity, for example, the Nissan Leaf S has only a 149 mile range and the Chevrolet Volt is limited to 249 miles. There are many “higher-end” EVs and electric pick-up trucks that have ranges of 300 miles or slightly greater, such as the Ford Mustang Mach-E, the Ford F-150 Lightening, the Tesla Model X, and the Mercedes Benz EQS SUV.

#### *3.3.3 Charging Time*

“How long an electric car battery takes to charge depends on its size, the speed of the charger that's being used, and the battery's state of charge when the vehicle is plugged in” (Edmunds, n.d., para. 8). Most EV owners charge their vehicles at home and typically install a 240-volt level 2 home charger which charges more rapidly than, for instance, the 120-volt level 1 outlet. “The Chevy Bolt EV only gains 4 miles of range in an hour using a 120-volt outlet” (Edmunds, n.d., para. 9). Owners can get away with that speed if they don't drive much on a daily basis and always have their EV plugged in while parked. But if the battery is almost drained after a long trip, it can take over two days to fully charge it (Edmunds, n.d.). The level 3 charger is the fastest but is only available at public charging stations. For instance, if charged at such infrastructure, the Chevy Volt can be fully charged in 1.5 hours versus approximately two days with a 120-volt (Edmunds, n.d.).

#### *3.3.4 Charging Cost*

Most EV owners charge their vehicles at home, utilizing off-peak electric grid hours to minimize costs. Knowing the kWh charges from the applicable utility company certainly aids cost-effective planning. For example, at 20 cents per kWh, the Chevy Volt level 1 at-home cost approximates \$13 to charge its battery pack (Edmunds, n.d.). Pre-calculation of likely costs, using a level 2 or level 3 charging station at a public site, is challenging, however. This is due to varying costs per station and the charging time per BEV. For example, the Audi Ioniq 5 takes approximately one hour to charge. At 37 cents per minute, it would cost approximately \$22 if charged for a full hour. At 25 cents per minute, it would drop to approximately \$15 and at 50 cents per minute, the cost would go to \$30 (Edmunds, n.d.).

#### *3.3.5 Battery Life*

Electric car batteries last significantly longer than lithium batteries found in smaller electronic devices (Edmunds, n.d.). The U.S. Department of Energy states modern electric car batteries last twelve to fifteen years in milder climates and eight to twelve years in more extreme climates. Many experts espouse these batteries may perform for up to 20 years or 200,000 miles. Electric car battery warranties are typically strong, and “the federal government requires at least an eight-year/100,000-mile warranty on electric car batteries. California requires manufacturers to provide a longer 10-year/150,000-mile battery warranty (Edmunds, n.d., para. 17).

#### *3.3.6 Battery Replacement Cost*

“According to Consumer Reports, the replacement cost for an electric car battery ranges from \$5,000 to \$15,000, which is similar to the replacement cost of an engine” (Edmunds, n.d., para. 18). This

assumes the battery is not otherwise covered by a warranty. In certain instances, only certain components in the battery pack will have to be replaced, thus lowering the costs.

### 3.4 Potential California Pivot Point from a Push to a Pull Strategy in Pursuit of Environmental Goals

Arguably California's "Zero Emissions Vehicle Mandate" has entered challenging times. There are two primary facets of the Mandate:

1. Electric vehicle truck mandate for 2036
2. Electric vehicle (generally passenger cars) mandate for 2035

As reported by the online California Globe (Symon, 2025), following years of legal battles, a coalition of States led by Nebraska has successfully influenced California to repeal the "Advanced Clean Fleet" electric vehicle truck mandate for 2036. A May 2025 update on the California Air Resources Board (Symon, 2025) states the following:

California has withdrawn its request for a waiver and authorization for the addition of the Advanced Clean Fleets (ACF) Regulation to its emissions control program. At this time, CARB is evaluating next steps. CARB is not enforcing the existing portions of the ACF Regulation that require a federal waiver or authorization, such as the portions of the ACF Regulation that apply to high priority and drayage fleets. However, not all elements of the ACF Regulation require a federal waiver or authorization. The state and local government fleets portion of the ACF Regulation remains unaffected. Because CARB is committed to reducing air pollution to protect public health, we encourage affected industries to continue reducing their emissions and we look forward to continued partnership in these efforts (CARB, 2025c).

Subsequently, the Wall Street Journal reported on a United States Senate vote not to grant a waiver for California's stricter car standards (stricter than National Standards), effectively killing California's EV 2035 mandate (Wise & Terlep, 2025). For clarification purposes, there are two separate issues in play. The revocation of emissions waivers by the US Senate applies to all types of vehicles. Within those "types" are trucks (pickups, delivery, etc.). California withdrew the waiver request for trucks, as indicated above, but did not withdraw the request for other vehicle types (generally, passenger cars). While these potential setbacks could be looked upon as tethered to the current administration and therefore only temporary, perhaps, given the size and nature of the cultural, political, legal and demographic shifts, a moment exists for California to rethink its' basic EV strategy.

In 1966, Elliott Lee wrote "A Theory of Migration" and introduced the concepts of Push and Pull Effects to describe the main drivers of human migration. Soon these concepts made their way into the Business discipline and were being applied as diametric Business Strategies in logistics and supply chain management. Finally, in 1967, Philip Kotler (2012) considered by many to be the father of modern-day marketing, as part of his writing on the four P's framework (Product, Price, Place, Promotion) included a discussion of Push versus Pull Strategies in Marketing (Kotler & Keller, 2005).

In the business world today, Push Strategies posit that you make something (a good or a service or a policy) and push it out to target customers and consumers for adoption. Pull Strategies posit that you understand what the target customers and consumers need, and then you fill those needs to create natural demand. Not unexpectedly, something that is "Pushed" upon someone tends to create "Pushback", whereas, filling a natural need tends to lead to a pulling in and adoption of something and therefore higher levels of acceptance. California's choice of words in describing their basic environmental strategy, up to now, "Mandate", reveals the Push Strategy it has been using. But what if a Pull Strategy was used instead? What would that look like and what could California focus on that would be more of a Pull than a Push?

This paper has shown that range anxiety is a major and arguably limiting factor in the adoption of EVs regardless of demographics. In addition, this paper has shown that California charging station availability and deployment is currently inadequate, and given that current plans are not likely to be addressed. Also, if charging stations were available, serious investigations of the capacity and stability of the California electrical grid strongly suggest the energy required to power such an increased electricity demand would not be clean, stable, or sufficient.

This suggests a potential policy strategy shift from Push to Pull would be for California to drop the Mandate/Push strategy and refocus its efforts on a Pull build out of the electric generation and electric grid, and charging station strategy. Not only would range anxiety be addressed, but concerns over

quantity and availability of electricity would be alleviated, something that could have tangible benefits in wildfire reduction and therefore positive environmental impact. Furthermore, serious consideration must be given to significant improvement in addressing the unaffordability of EVs for low-to-moderate income households. The pull strategy, as related to EV subsidies addressing affordability, must realistically address the following:

It is common knowledge that California has incurred significant budget shortfalls in recent years, including effective abandonment of the Clean Vehicle Rebate Project (CARB, 2025a). The new combined program with the Clean Cars 4 All Program contains onerous income qualifications also requiring the “turning-in” of a pre-2007 gas-guzzling vehicle, and no data is available from the State identifying participation rates in 2024 or 2025. A review of the CARB 2024 Climate Investments Annual Report (CARB, 2024, pp. 66 – 75) reflects a cumulative total of \$1.046 billion in project awards for the Clean Vehicle Rebate Project, an increase of \$15 million (or 1.5%) over the 2023 Annual Report (CARB, 2024). The 2024 Clean Cars 4 All Program indicates cumulative awards amounting to \$202 million (CARB, 2024), an increase of \$25 million over the 2023 report. However, the data in the Climate Change Investments Annual Reports is six to twelve months behind, and the CARB has not reported any new activity in the combined program, effective November 8, 2023 and beyond, when the Clean Vehicle Rebate Project was closed (CARB, 2025d).

It is puzzling, yet potentially encouraging from a Pull strategy, that California has not allocated more funds for EV subsidies since the Cap-and-Trade Program is the primary funding source as indicated in the Climate Change Investments Annual Reports. When combining 2024 cumulative awards for both the Clean Vehicle Rebate Project and Clean Cars 4 All, amounting to \$1.248 billion, and comparing this sum to cumulative awards for all projects of \$13.913 billion, the percentage allocated to EV purchase incentives amounts to only 8.97%. The discretionary cap-and-trade pool is set at 40% as directed by legislation (MTC, 2025), and the aforementioned EV incentive programs are part of this pool. Because vehicle and semi-truck diesel emissions account for 39% of all carbon emissions in California (CARB, 2025e), the largest of seven categories of carbon emitters, the lack of greater EV subsidy allocations appears troubling, but potentially could create significant increases in allocations in the future.

At current annual cap-and-trade funding levels of approximately \$2.2 billion (CARB, 2023, 2024), the discretionary 40% portion amounts to roughly \$880 million per annum. To date, in the non-discretionary category, cumulatively since program inception, \$4.4 billion has been awarded to affordable housing and \$6.5 billion to the High-Speed-Rail Project (approximating the 30% requisite funding of roughly \$22 billion in cumulative funding) (CARB, 2024). Neither of these categories demonstrates significant carbon reductions when compared to other categories, and the controversial High-Speed-Rail (HSR) has yet to be completed (Bikerton, 2025). The California legislature has the authority to amend cap-and-trade allocation percentages and could even increase the non-discretionary portion to accommodate even greater awards for EV purchase incentives/subsidies (MTC, 2025). However, pursuant to legislation signed by Governor Newsom on 19 September 2025, the cap-and-trade program has been extended to 2045 (Kuang & Mihalovich, 2025), which theoretically could provide more funding for EV and charging stations’ subsidies. Perhaps complicating any future funding of such subsidies is recent legislation that guarantees \$1 billion per year for ongoing HSR funding (California High Speed Rail Authority, 2025). It is not known how this annual obligation will impact any future EV and charging stations’ subsidies in light of other competing projects, but considering that the HSR was previously receiving 30% of cap-and-trade revenues, an increase to roughly 50% (\$1 billion/\$2.2 billion) would seemingly impair funding for other projects.

In effect, it appears that California policy makers tout mandatory EV sales/use and have theoretically had access to significant resources to match policy with practice. Reasons for the inadequate historical subsidies are both puzzling and unknown, but one must question the political will to shift more funds to encourage greater EV sales among populations with not only affordability challenges but higher income households as well. These authors could not locate any evidence of cost-benefit analyses related to the various programs/projects funded by cap-and-trade. Again, the Legislative Analyst Office criticized CARB for not having any mechanism for measuring carbon reductions for the funded projects (LAO, 2024).

## 4. CONCLUSIONS

### 4.1 Research Question 1

Does an analysis of current data and trends suggest California would have been able to achieve 100% compliance with the “Original Mandate” for brand new zero emissions auto sales by 2035 (this assumes new EV sales only would replace 1.8 annual sales for all fuel types)?

Based on the analysis provided in this paper it is improbable that California would have achieved 100% compliance with the “Original Mandate”. The secondary data and literature show less than robust demand for zero-emissions vehicles by citizens at both the National level and more importantly at the State level within California.

Digging more deeply into what is likely to be a driver of the shortfall is an analysis showing that California incentives focused on low-income California Households (those making less than \$75,000 per year), while well intentioned, were not likely enough to encourage these low-income socio-economic groups to appreciably participate. This demographic makes up 40% of the 13,699,816 households in California, per Table 6, and their lack of participation severely attenuated implementation in all likelihood.

### 4.2 Research Question 2

Based on current trends and ancillary data, can California develop enough charging stations to facilitate desired purchase demand for brand new zero emissions EV's?

The analysis provided in this paper shows that under either of two scenarios, CARB's (2022) implied pseudo-exponential EV ramp up to a 2035 total of over 12 million new EVs in service, or a straight-line increase in EV's as posited by data from Anderson<sup>19</sup>, in-service charging stations fall short of needs. As the current distribution of charging stations is very West Coast centric, the lack of charging stations in the inland and more mountainous sections of California likely adds to consumer concerns around range anxiety. In addition, the lower socio-economic households performing more so-called blue collar manual jobs and services will find the lack of charging stations even more problematic.

### 4.3 Recommendation

As discussed by Push-Pull Theory, California should drop the Mandate/Push strategy and refocus its' efforts on a Pull build out of the electric generation and electric grid and charging station strategy, as well as allocating all future cap-and-trade funds (discretionary and non-discretionary) to EV purchase incentives/subsidies, as well as charging station financial assistance for low-to-moderate income households. Not only would range anxiety (the limited number of miles that can be driven by an EV battery charge) be addressed but concerns over quantity and availability of electricity would be alleviated, something that could have tangible benefits in wildfire reduction and therefore have a positive environmental impact.

Addressing significant development of charging stations must include outreach to, and cooperation with, local government stakeholders, such as counties and cities, as well as business organizations such as local chambers of commerce and the Building Industry Association. Enlargement of the stakeholder pool is essential as California has extremely diverse factors that influence charging station construction, such as racial and cultural diversity, income disparities, geographical differences and extremes, vast differences between rural and urban populations/areas, and political differences.

Regarding EV affordability, even if the discretionary 40% pool were strictly allocated to EV purchase incentives, with no adjustments to the non-discretionary funding, it appears that endeavor would quadruple cumulative funding to date in just five years.

### 4.4 Areas for Further Research

The following points are worth noting to evolve the future research:

1. Extensive research, quantitative and qualitative, is necessary in low-income communities to assess factors related to their acceptance of EVs, as well as how a government subsidized charging station would influence their decision to buy a new EV.
2. In addition, this research needs to determine the affordability of new EVs and what monthly payment is necessary to facilitate EV purchases in these communities.
3. Beyond low-income communities, research is needed for all income groups as some evidence suggests EV demand is leveling and even reducing in some groups.
4. Targeted technical research is necessary to evaluate the installation of charging stations in multi-family apartments where many low-income households reside. Further complicating the installations is the well-known common knowledge factor of excessive street parking in these communities. Because of the high cost of rent, apartments often contain more than one household, but most adult occupants typically have a vehicle. The number of parking spaces in the apartment complexes is usually inadequate.
5. In addressing necessary charging station development, the use of Geospatial Analysis (GIS) to visually map infrastructure gaps and Time-Series and Machine Learning models would be beneficial to further explore the consumer behaviors and infrastructure gaps.

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### *Authors' Contributions (in accordance with ICMJE criteria for authorship)*

<i>Contribution</i>	<i>Author 1</i>	<i>Author 2</i>	<i>Author 3</i>	<i>Author 4</i>
Conceived and designed the research or analysis	Yes	Yes	Yes	Yes
Collected the data	Yes	No	No	No
Contributed to data analysis & interpretation	Yes	Yes	Yes	Yes
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To see original copy of these declarations signed by Corresponding/First Author (on behalf of other co-authors too), please download associated zip folder [Ethical Declarations] from the published Abstract page accessible through and linked with the DOI: <https://doi.org/10.33002/jpg050201>.

# *From Dust We Came and from Dust We Shall Return: Settler Scholar Positionality, Equity and Collaborative Commitment in Higher Education Reform*

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## ABSTRACT

This essay interrogates settler scholar positionality in relation to equity and collaborative commitment within higher education reform, arguing that meaningful decolonization requires reflexive, ethically grounded partnerships with Indigenous communities. Drawing on frameworks such as Two-Eyed Seeing, Movement-based Participatory Action Research, and transformative leadership, the paper situates settler scholars within colonial legacies that shape knowledge production, curriculum, governance, and climate justice narratives. It explores how entrenched power dynamics and systemic barriers—manifested in curricula, institutional policy, and philanthropic reconciliation discourses—undermine Indigenous epistemologies and perpetuate exclusion unless actively addressed. Through case studies and theoretical synthesis, the work articulates models for equitable engagement, including the institutionalization of Indigenous Knowledge Holders Councils, co-created research agendas, and culturally responsive pedagogy. The analysis emphasizes the necessity of accountability, sustained reflexivity, and ethical research practices that center Indigenous agency, data sovereignty, and shared governance. Challenges in forming genuine partnerships are examined, including historical distrust, divergent epistemic expectations, and institutional inertia, along with strategies to overcome them. The essay concludes with a call to action for settler scholars: to move beyond performative allyship toward sustained structural change by embedding Indigenous methodologies, supporting Indigenous leadership, and co-developing knowledge systems that advance equity, resilience, and reconciliation (John et al., 2024).

**Keywords:** Settler scholar positionality; Decolonizing higher education; Indigenous–Settler partnerships; Two-eyed seeing; Indigenous knowledge systems; Ethical and reflexive research practice; Shared governance and data sovereignty

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## 1. INTRODUCTION

An analysis of *settler scholar positionality* requires a critical examination of how personal and institutional identities influence equity, collaboration, and reform in education. This essay - *From Dust We Came and from Dust We Shall Return*<sup>1</sup> - addresses a persistent gap in the scholarship on reconciliation and decolonization in higher education — specifically, the lack of critical engagement with *how settler scholars understand, navigate, and operationalize their positionality* within institutional frameworks shaped by colonial histories. While many studies have emphasized the need for Indigenizing curricula and governance, fewer have interrogated the internal dynamics of power, privilege, and self-reflection that shape the relationships between settler and Indigenous educators. This gap limits our understanding of how authentic, equitable collaboration can occur in the shared work of decolonizing education (Bennett et al., 2022).

This study also responds to a broader gap in applied educational reform research: the disconnect between policy-level commitments to reconciliation and the lived practices that enact those commitments. The Truth and Reconciliation Commission (TRC) has explicitly called upon post-secondary institutions to integrate Indigenous knowledge systems, methodologies, and worldviews across disciplines. In particular, Call to Action #62 highlights the need to reshape curricula that have historically prioritized Western epistemologies, thereby reproducing systemic inequities and epistemic marginalization (McCagg-Nystrom, 2024). Yet, while institutional strategies often reference the TRC, there remains insufficient empirical and theoretical exploration of *how these commitments translate into practice* through the leadership, teaching, and research roles of settler academics.

Operationalizing reconciliation within academic institutions requires tangible mechanisms for change. Initiatives such as the establishment of *Indigenous Knowledge Holders Councils* illustrate one such mechanism, as they embed Indigenous perspectives directly within governance and decision-making processes. These initiatives go beyond symbolic inclusion; they embody a transformative approach to institutional culture that seeks to elevate Indigenous epistemologies to equal footing with Western knowledge traditions (Fisk et al., 2024). The integration of these structures demonstrates how institutions can move from representation to empowerment, promoting environments where Indigenous students, faculty, and staff can thrive. However, the gap remains in understanding how settler scholars position themselves in relation to these transformative shifts — whether as allies, collaborators, or passive participants in systemic change. This paper, therefore, explores how positional awareness and critical self-reflection can deepen institutional commitments to equity and reconciliation (Daly, 2024; Avramovic, 2024).

Furthermore, the intersection of collaborative practices between Indigenous and settler educators highlights another underexplored dimension: how relational, cross-cultural pedagogies contribute to dismantling systemic racism entrenched in educational systems. For instance, collaborative models involving Indigenous community nurses and settler nurse educators reveal the practical value of *Two-Eyed Seeing*, which draws from both Indigenous and Western frameworks to enhance teaching and learning (Archer, 2024). These examples demonstrate how co-created pedagogical spaces can challenge entrenched hierarchies of knowledge and facilitate culturally safe, inclusive learning environments. Yet, there remains a critical need to theorize how such collaborations can be scaled and sustained within broader institutional structures.

In addressing these interrelated gaps — the limited interrogation of settler scholar positionality, the disjunction between policy and practice in reconciliation efforts, and the need for sustained models of collaborative pedagogy — this paper contributes to ongoing discourses on decolonization in higher education. It argues that genuine progress toward reconciliation requires not only institutional change but also the transformation of individual scholarly identities. By critically engaging with their positionality, settler scholars can move beyond performative allyship toward meaningful participation in collective, Indigenous-led educational reform.

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<sup>1</sup> It originates from the Bible, specifically Genesis 3:19, where God tells Adam that he was created from dust and will eventually return to dust. This phrase is often used during funerals and on Ash Wednesday to remind people of their earthly origins and eventual return to the ground.

## 2. DEFINITION OF SETTLER SCHOLAR POSITIONALITY

As mentioned, settler scholar positionalality requires a critical examination of one's location within broader historical, cultural, and socio-political frameworks. Settler scholars often navigate a complex landscape marked by colonial histories that privilege their positionalality while simultaneously shaping the experiences of Indigenous populations. This duality compels a reflective practice in which scholars are urged to interrogate how their identities and academic pursuits intersect with ongoing colonial legacies. By recognizing the power differentials at play, settler scholars can evaluate their contributions to knowledge production within academia, especially when addressing topics of equity and inclusion. As scholars engage in this reflective exercise, they need to consciously dismantle the barriers that perpetuate systemic inequities and strive for more collaborative and equitable research practices, as highlighted through initiatives that aim to address historical injustices (Antifaeff, 2024; Mad Plum et al., 2024).

From a methodological standpoint, defining settler scholar positionalality is not merely a theoretical act — it shapes how researchers design, conduct, and interpret their studies. Reflexivity becomes a methodological tool that compels scholars to examine their underlying assumptions, power relations, and modes of engagement with Indigenous and marginalized communities. This recognition invites the integration of decolonizing and participatory research approaches, such as Talanoa, Kaupapa Māori, or community-based participatory methods, which prioritize relational accountability and collective knowledge production. In this way, the articulation of settler scholar positionalality directly influences methodological stance by embedding ethical responsibility, respect for Indigenous epistemologies, and recognition of multiple worldviews into every stage of research (Johnson & Endres, 2021; Viswanathan et al., 2004).

Moreover, settler scholar positionalality encompasses obligations to not only acknowledge but actively combat the systemic racism ingrained in academic institutions. This recognition necessitates transformative leadership within scholarly frameworks, fostering a commitment to inclusivity and diversity in research. For instance, institutions such as Big River College demonstrate a proactive response to the Truth and Reconciliation Commission's Calls to Action by integrating Indigenous knowledge systems into their governance structures (McCagg-Nystrom, 2024). By establishing councils like the Indigenous Knowledge Holders Council, stakeholders gain insights into the complexities of Indigenous experiences. Consequently, settler scholars must leverage such initiatives as blueprints for establishing equitable platforms that involve Indigenous perspectives. This institutional alignment also reinforces how positionalality guides methodological integrity — encouraging the co-creation of research agendas and interpretive frameworks that reflect Indigenous priorities and relational ethics rather than external imposition.

The ongoing discourse surrounding equity in academia directly links settler scholars' positionalality with their responsibility to advocate for and institute meaningful change through collaborative commitments and practices reflective of Indigenous priorities (Wrigley, 2024). Finally, the impact of settler scholar positionalality extends into climate justice discussions, where scholars must grapple with their roles amidst the pressing challenges posed by climate change, particularly in colonized contexts. Research initiatives have indicated that climate justice efforts often mirror existing racial, gender, and class inequalities, complicating the narratives surrounding community resilience and advocacy (Wrigley, 2024). As settler scholars engage with these dynamics, they must reflect on how their academic frameworks either contribute to or disrupt the status quo of privilege and exclusion. This critical engagement not only fosters a deeper understanding of the intricate relationships between social justice and environmental issues but also creates pathways for coalition-building among diverse stakeholders.

Ultimately, the responsibilities inherent in settler scholar positionalality compel researchers to align their work with the broader goals of equity, social justice, and cultural accountability in a rapidly changing global landscape (Mad Plume et al., 2024). By integrating this positional awareness into their methodological framework, scholars transform positionalality from a descriptive label into an active, guiding principle that informs ethical decision-making, interpretation, and knowledge dissemination. As such, settler scholar positionalality serves as both a conceptual and methodological foundation for research committed to decolonial transformation and relational accountability.

## 2.1 The Layered Touchtone for Settler Scholars

The title “*From dust we came and from dust we shall return*” (Genesis 3:19) serves as a rich and layered touchstone for settler scholars, but its meaning depends on how it is taken up. The “dust” metaphor operates not only as a creative and interdisciplinary image but also as an analytical framework through which to examine cycles of materiality, temporality, and accountability in human–land relations. As a conceptual lens, “From Dust to Dust” invites reflection on the ontological and ethical dimensions of belonging, mortality, and regeneration. It encourages scholars to interrogate how colonial, ecological, and spiritual narratives intertwine in shaping our understanding of origin and return — of becoming and unbecoming within the same ground that sustains us.

## 2.2 Humility and Shared Origin, not Innocence

The biblical reminder of mortality and material commonality can ground settler scholars in humility. Recognizing that all humans and the land are of the same “dust” challenges grand narratives of ownership, mastery, and separation. Eco-theological critique — especially the move beyond a triumphalist “dominion” reading of Genesis toward relational stewardship — frames humans as caretakers embedded in ecosystems, not sovereign extractors (Orr, 2017; “Beyond Stewardship” literature). That shared origin can open ethical space for listening, reciprocity, and care rather than asserting entitlement.

## 2.3 Caveat

This universality can also be co-opted as a *settler move toward innocence* — e.g., “*we’re all dust, so historical injustices are smoothed over.*” Tuck and Yang (2012) warn against such metaphors that let settlers neutralize accountability by flattening differences; decolonization, they stress, is about the *return of land and life*, not abstract mutual vulnerability. So, the “dust” motif should not become a rhetorical absolutism that erases the specific histories of dispossession and ongoing structural inequities settler scholars are implicated in.

## 2.4 Responsibility and Reciprocity

If “dust” is what connects us materially to place, then settler scholars’ work is not simply intellectual but ecological and relational. The phrase can be read as a covenantal prompt: since our being is sourced in the land and will return to it, our engagements — especially as outsiders on colonized territory — must aim to restore soil, relationships, and knowledge systems, not further degrade or appropriate them. Indigenous frameworks emphasize *responsibility to land* rather than ownership, and settler scholars can align with that by centering Indigenous knowledge, supporting land-back movements, and co-creating research that acknowledges data/knowledge sovereignty.

## 2.5 Temporal Perspective and Accountability

Mortality (“to dust you shall return”) reminds scholars that their influence is finite; structural change requires commitments beyond individual careers. Settler scholars, therefore, should orient their positionality toward sustained institutional transformation — embedding Indigenous governance, shared agenda-setting, and reparative practices — rather than performative, short-lived “allyship.” Reflexivity about one’s own legacy is deepened: the dust to which one returns includes the consequences of one’s work.

In essence then, the Genesis phrase can be a generative metaphor for settler scholars if held with nuance: as a call to humility (recognizing shared materiality), as a rejection of innocence (not using universality to evade responsibility), and as an ethical anchor toward long-term, reciprocal, and decolonizing engagement. Grounded in eco-theology’s reframing of human-land relations and informed by decolonial critique (e.g., Tuck & Yang, 2012), it helps situate settler scholarship not as stewardship-in-name only, but as ethically accountable co-joining with Indigenous-led lifeways and knowledge systems (Orr, 2017).

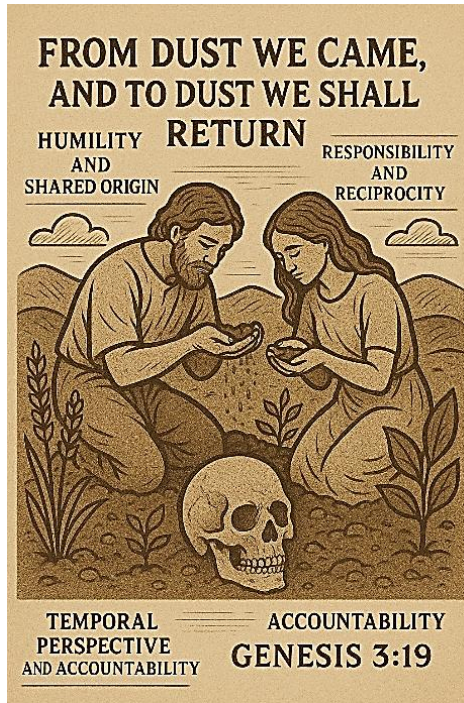


Figure 1: "From Dust to Dust: Humility, Responsibility, and the Covenant of Return" captures the Genesis 3:19 reference, "Our eco-theological lens, and the three principles — humility/shared origin, responsibility/reciprocity, and temporal accountability ( *Source*: OpenAI (2025a). Note: AI-generated illustration; all people and buildings depicted are fictitious.

### 3. IMPORTANCE OF EQUITY IN ACADEMIC DISCOURSE

Equity in academic discourse serves as a foundational pillar in dismantling entrenched structures of inequality, particularly within the context of settler scholar positionality (Bennet et al., 2022). It necessitates a critical examination of the implicit biases that persist within scholarly environments, often sidelining marginalized voices and perpetuating power imbalances. By fostering an equitable framework, higher education and college scholars not only promote inclusivity but also facilitate a more comprehensive understanding of sociocultural phenomena. For instance, the notion of Midwest Nice, while seemingly benign, encapsulates a complex interplay of Whiteness that can hinder anti-racist dialogues and inhibit meaningful inquiry (Homan, 2025). Consequently, addressing equity in academic discourse becomes imperative not merely as a normative ideal but as a transformative tool for social justice and scholarly integrity, compelling researchers to actively engage in praxis that prioritizes underrepresented perspectives. Furthermore, the practice of engaged scholarship (Molla, 2024), underscores the necessity of equity in academic discourse by facilitating collaboration among diverse stakeholders. This approach not only enriches academic inquiry but also positions scholars as agents of social change. Engaged scholarship promotes collective narratives, enabling a multiplicity of voices to inform discourse, particularly in areas traditionally dominated by authoritative perspectives (Molla, 2024). However, scholars frequently confront discontents such as narrow definitions of what constitutes knowledge, potentially stymying genuine engagement. Recognizing these challenges, it becomes crucial to cultivate ecosystems supportive of equity that empower researchers to navigate a complex landscape of public engagement. Such ecosystems would encourage the adoption of methodologies that embrace diverse epistemologies, thus reinforcing the moral imperative to mobilize academic research toward tangible social outcomes (Islam, 2025). In tandem with engaged scholarship, community-based participatory research (Viswanathan et al., 2004), exemplifies the integral role equity plays in amplifying marginalized voices within academic discourse. Initiatives like the *¿Dónde Vive la Ciencia en su Comunidad?* Translated in English "Where does science live in your community?" project illuminate how collaborative methodologies, such as photovoice, can foster critical dialogue around pressing social

justice issues (Comunidad, 2024). Through this lens, community researchers not only engage with their environments but also interrogate the dual nature of STEM as a tool for both control and empowerment (Andress et al., 2020; Symons and Blannin, 2019). This approach foregrounds the importance of maintaining dignity and respect for local knowledge systems, thereby challenging dominant narratives that often overlook the lived experiences of marginalized populations. By advocating for inclusive practices, scholars can contribute to the reclamation of political power and cultural identity, thereby enhancing the overall quality of scholarship and advocating for justice-oriented change (Tebeje, 2025; Balasco, 2024).

### 3.1 Overview of Collaborative Commitment in Research

In the realm of collaborative research, commitment emerges as a crucial factor underlying equitable partnerships between settlers and Indigenous communities. This collaborative commitment goes beyond mere participation; it necessitates a re-examination of positionality and power dynamics that have historically marginalized Indigenous voices. As highlighted in contemporary literature, such as (Wrigley, 2024), the complexities of climate justice elucidate the necessity for engaged activism that privileges local knowledge and community-led solutions. Achieving a truly collaborative framework involves acknowledging the impediments posed by colonial legacies and institutional structures that perpetuate inequality. Therefore, fostering authentic collaborative efforts requires researchers to engage in continuous self-reflection, recognizing their roles as both knowledge producers and potential barriers to equity. By dismantling traditional hierarchical models of research, scholars can better empower Indigenous communities to shape their narratives, thereby bridging gaps in social, cultural, and environmental justice. The commitment to collaborative research must also integrate principles of decolonization and respect for Indigenous methodologies, creating a foundation for equitable partnerships. Through frameworks like Movement-based Participatory Action Research (PAR), as discussed in Morales (2016) and Wrigley (2024), researchers can advocate for practices that promote collective agency and contribute to the resilience of marginalized communities. This approach emphasizes co-creation of knowledge, allowing Indigenous communities to articulate their unique challenges while fostering an environment conducive to transformative social change. Additionally, the impact of school engagement in nurturing belonging, as articulated in, serves as a parallel for how equitable involvement can enhance collaborative research outcomes (Umamageswari and Bagyalakshmi, 2023). By establishing a symbiotic relationship between researchers and Indigenous participants, studies can genuinely reflect the lived experiences and aspirations of communities, ultimately leading to more sustainable and culturally relevant solutions (Datta, 2013). Finally, the evaluation of collaborative commitments must extend to the analysis of structural frameworks that govern research environments. The systemic examination of policies through an anti-racist and equity lens, as explored in (Antifaeff, 2024), underscores the importance of dismantling barriers that inhibit meaningful collaboration. Moreover, integrating Indigenous perspectives into research agendas, as seen with the initiatives in (Mad Plume, 2024), not only legitimizes Indigenous knowledge systems but also enriches the overall research landscape. This double-pronged approach embodies a commitment to equity that transcends superficial engagement, demanding accountability and active participation from settler scholars. Ultimately, fostering collaborative commitment entails a profound acknowledgment of both the ethical implications of research practices and the imperative to engage in ongoing dialogue and mutual learning. This commitment not only serves as a catalyst for social change but also positions collaborative research as a key mechanism for addressing historical injustices and promoting inclusive growth.

### 3.2 Historical Context of Settler Scholarship

The historical context of settler scholarship reveals a complex tapestry interwoven with colonial and post-colonial narratives that often perpetuate inequities within educational frameworks (Pewewardy and Lees, 2022). Central to this analysis is the acknowledgment of the longstanding impact of colonialism, particularly as it pertains to Indigenous populations whose histories and contributions have been marginalized. The Truth and Reconciliation Commission's Calls to Action, specifically #62, calls for a transformative shift in post-secondary education by incorporating Indigenous knowledge systems (IKS), philosophies, and pedagogies (McCagg-Nystrom, 2024). This incorporation is critical in dismantling the

hegemonic structures that have defined academic discourse, allowing for an enriched understanding of Indigenous worldviews. The emphasis on fostering allyship among educators, particularly settler scholars, necessitates a focused commitment to authentic relationships with Indigenous communities, reinforcing the premise that equitable education can only arise from genuine collaboration and recognition of diverse epistemologies (Figure 2).

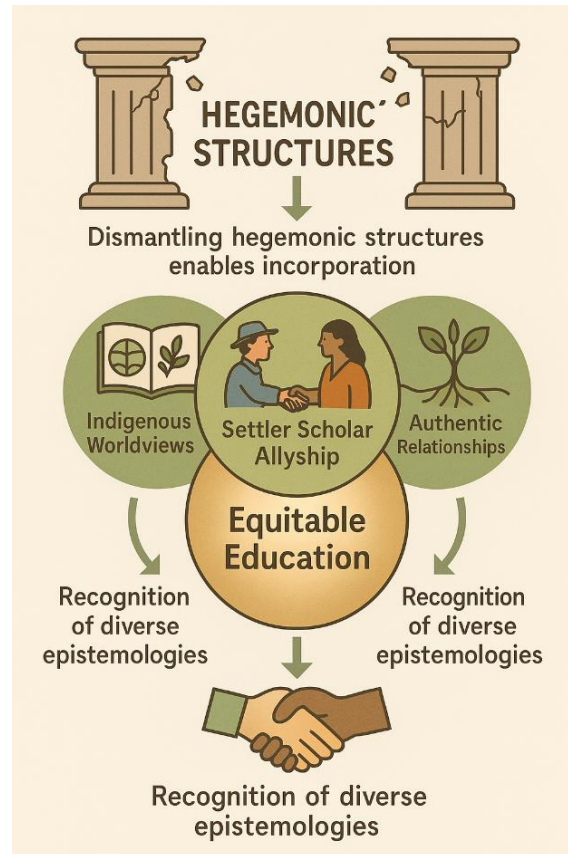


Figure 2: Dismantling hegemonic structures enables the incorporation of Indigenous worldviews, settler scholar allyship, and authentic relationships, converging to produce equitable education grounded in recognition of diverse epistemologies (Source: OpenAI (2025b). ChatGPT (Aug 12 version) [Large language model], <https://chat.openai.com/>. Note: AI-generated illustration; all people and buildings depicted are fictitious.

Briefly, figure 2 illustrates (at the top) are two cracked classical columns labeled “*Hegemonic Structures*”, with fragments falling away - visualizing their breaking down or dismantling. A downward arrow leads to a central Venn-like triad of overlapping circles: “Indigenous Worldviews”, “Settler Scholar Allyship”, and “Authentic Relationships”. Their intersection feeds into a glowing central sphere labeled “Equitable Education”. From that sphere a further arrow points down to a handshake icon, reinforcing collaboration. Around the lower part are textual reinforcement arrows reading “Recognition of diverse epistemologies”, showing how those epistemologies flow into and support equitable education.

The implications of settler scholarship are not restricted to the realm of curriculum development but extend into broader institutional practices and governance models. For instance, the integration of Indigenous Knowledge Holders Councils within the governance structure of educational institutions, such as demonstrated at Big River College, exemplifies a proactive response to the Calls to Action (McCagg-Nystrom, 2024). Establishing such councils provides critical direction to leadership while ensuring Indigenous perspectives are adequately represented and integrated in academic decision-making processes. This shift towards inclusive governance is framed through theoretical underpinnings that promote a culturally responsive and adaptive educational environment. The commitment to these frameworks is indicative of a larger cultural metamorphosis within educational institutions, aiming to create not only access but a supportive infrastructure that bolsters the success of Indigenous faculty, staff,

and students. In grappling with the historical context of settler scholarship, it becomes evident that the positionality of settler scholars plays a pivotal role in shaping narratives around equity and social justice in education. The need for a reflective practice, wherein educators critically examine their identities and the implications of hegemonic ideologies, fosters an environment conducive to equity-oriented pedagogy. Encouraging pre-service teachers (PSTs) to engage in justice-oriented actions, as outlined in recent educator frameworks, prompts an exploration of self within community contexts. This proactive engagement not only aids in bridging the gap between educators and the communities they serve but also cultivates a consciousness that actively subverts systemic oppression. Fostering a pedagogy that integrates intersectional analyses allows settler scholars to challenge neoliberal legacies (Mannergren et al, 2024; Johnson and Endres, 2021) and advocate for inclusive curricula that resonate with the complexities of both individual and collective experiences, thereby advancing the broader goals of equity and reconciliation in educational settings.

#### 4. METHODOLOGY

This study employs a multi-layered qualitative design that integrates critical discourse analysis, institutional case study synthesis, movement-based participatory action insights, and structured autoethnography (Tarisavi, 2023). The analytical frame is grounded in “Two-Eyed Seeing” (Etuaptmumk) as a guiding interpretive lens — bringing Indigenous and Western knowledge systems into dialogue — and in Movement-based Participatory Action Research (PAR) principles emphasizing co-creative and accountable engagement (Archer, 2024; Reid et al., 2020; Wrigley, 2024). Data were gathered from institutional documents, policy texts, and scholarly literature, as well as field notes and memos generated through participation in committees, collaborative initiatives, and community-led spaces. Movement-based PAR insights emerged from observation, publicly shared community artifacts, and reflective documentation of co-learning processes. The autoethnographic component was systematically developed through a reflective journal, retrospective fieldnotes, and analytic memos tracing tensions, positionality, and evolving understandings.

Analysis followed a structured, multi-step approach aligned with the above frameworks. Critical discourse analysis examined textual features, discursive practices, and broader social contexts to illuminate institutional narratives and silences. Institutional, participatory, and movement-based data were coded thematically using constant comparison, focusing on categories such as accountability, relational ethics, and settler reflexivity. Autoethnographic materials were also analyzed through chronological organization, thematic coding, and iterative interpretation, ensuring personal experience was rigorously connected to institutional and discursive patterns. Insights across all strands were brought into conversation through an integrative analytic matrix informed by Two-Eyed Seeing and PAR principles, producing a coherent and relational interpretation of settler scholar positionality, equity, and collaborative practice.

##### 4.1 Research Design and Analytical Frame

The methodology used was interpretive, iterative, and multi-scalar, enabling both textual and experiential forms of inquiry. Two-Eyed Seeing serves not only as a philosophical framework but also as a methodological commitment: research questions, selection of texts, and engagement with collaborators are guided by an ethos of relational accountability, mutual respect, and contextual responsiveness. Movement-based PAR principles inform data generation through cyclical reflection, action, and dialogue, positioning both researcher and participants as co-learners and co-constructors of meaning.

##### 4.2 Data Gathering and Critical Discourse Analysis

The first phase of data collection involved a critical literature and discourse review of both foundational and contemporary sources relating to decolonial pedagogy, equity frameworks, philanthropic reconciliation narratives, and institutional governance structures. This included:

- A systematic review of academic literature drawn from peer-reviewed journals, policy documents, and institutional reports published between 2018–2024.

- The collection of discourse materials from policy statements, public addresses, and university equity frameworks related to Indigenous engagement and reconciliation.

The analytical process involved critical discourse analysis (CDA) techniques, focusing on the identification of recurring metaphors, language of inclusion/exclusion, and narrative constructions of “reconciliation” and “equity.” Using an interpretive coding process, key discursive patterns were mapped to expose continuities of colonial durability and to trace shifts in institutional rhetoric (Barron, 2024; Trimble, 2024).

#### 4.3 Institutional Case Study Synthesis

In the second phase, the study incorporated institutional case studies and exemplars as empirical illustrations. These included:

- Cases of collaborative curriculum design in the sciences and distance learning education.
- Institutional governance shifts integrating Indigenous Knowledge Holders Councils.
- Leadership adaptations within universities and philanthropic organizations promoting Indigenous co-governance models.

Cases were selected purposively based on their relevance to questions of equity, positionality, and transformative institutional practice. Data sources included published institutional reports, policy evaluations, and documented examples of curricular change. Cross-case synthesis was then applied to identify recurring patterns of institutional resistance and innovation, illuminating how power relations are negotiated in practice and how equitable structures have been institutionalized or constrained (Daly, 2024; McCagg-Nystrom, 2024).

#### 4.4 Reflective Autoethnography and Researcher Positionality

The third methodological strand is reflective autoethnography, which situates the researcher’s lived experience as a settler scholar within the broader analytical framework. This component was procedurally grounded in three interrelated practices:

1. Reflexive journaling: Ongoing field notes and personal reflections documented during teaching, research collaborations, and institutional engagements in Canada, Oceania, and other regions.
2. Dialogic validation: Regular, informal dialogues and structured conversations with Indigenous collaborators and academic peers to ensure cultural accountability and to check interpretive bias.
3. Ethical reflexivity: Systematic examination of how privilege, power, and institutional roles shape knowledge production, using iterative cycles of reflection and revision (Antifaeff, 2024; Orcherton, 2023a, 2023b; Wrigley, 2024).

Data from journals and dialogues were coded thematically to trace recurring moments of tension, humility, and learning, thus linking individual reflexivity to collective responsibility within the research process.

#### 4.5 Integrative Synthesis and Knowledge Co-creation

Finally, synthesis across the three methodological strands — discourse analysis, institutional case study, and autoethnographic reflection — was achieved through triangulation. This involved systematically cross-referencing discursive patterns with institutional exemplars and reflexive insights to identify convergences and disjuncture’s between theory, practice, and lived experience. The synthesis process generated actionable models for equitable engagement that emphasize co-governance, shared research agendas, and culturally responsive pedagogy. This integrative process transforms the methodology from a purely analytical exercise into a praxis of relational accountability, allowing critique and generative possibilities to coexist within a decolonial and equity-driven framework.

## 5. ORIGINS OF SETTLER COLONIALISM IN ACADEMIA

The conceptual underpinnings of settler colonialism in academia emerge from a complex interplay of historical, ideological, and institutional factors that have perpetuated epistemic dominance. This phenomenon, rooted in colonial practices, is characterized by a systematic erasure of Indigenous knowledge systems (IKS) and the imposition of Western, Colonialist or Eurocentric frameworks in educational curricula (Leonardo et al., 2023). The historical context reveals a persistent trend in which academic paradigms prioritize Western methodologies, often relegating Indigenous perspectives to peripheral status. Such academic structures not only undermine the validity of Indigenous knowledge but also reinforce a colonial legacy that mandates the assimilation of marginalized knowledge systems into dominant discourses. As highlighted in recent research, there is a significant need for curricula that genuinely integrate IKS to create a more equitable learning environment that challenges prevailing narratives and fosters an inclusive approach to education (Potocki, 2025). The relevance of these dynamics extends beyond theoretical discussion, necessitating actionable frameworks for decolonization within educational settings. Drawing on the foundational tenets of settler colonial theory (Macoun and Strakosch, 2013), it becomes evident that contemporary academic practices are often complicit in reproducing systems of oppression defined by race, class, and gender. The articulation of frameworks for understanding climate justice, for instance, interrogates how institutional biases manifest within climate narratives and advocacy efforts. Specifically, as seen in the work addressing climate activism (as an example) in Western Australia, the intersections of settler colonialism with racial capitalism exacerbate inequalities, marginalizing Indigenous voices and experiences within discussions about climate solutions (Wrigley, 2024). The implications of such marginalization are profound, as they not only deny authentic representation but also dilute the rich potential of IKS in addressing pressing issues such as environmental sustainability. This reveals a critical need for scholars and institutions to engage in self-reflection regarding their positionality and commitment to equity, particularly in how they facilitate inclusive dialogues around climate justice and community resilience. Addressing the roots of settler colonialism in academia necessitates a call to reexamine collaborative endeavors, especially in the context of joint scholarship between Indigenous and non-Indigenous scholars. The collaborative potential, as evidenced by initiatives like the UCLA Freedom School, underscores the urgency of generating emancipatory knowledge that prioritizes equity, social justice, and community empowerment (Pelican et al., 2025). Engaging in critical dialogue about land and housing justice reflects a broader commitment to dismantling colonial legacies ingrained in institutional practices. According to Ananya et al., (2025) and Maliha (2024), this necessitates rethinking methodologies that promote relational accountability and fostering partnerships that prioritize Indigenous methodologies and epistemologies (Ananya et al., 2025); Maliha, 2024; The examination of academic collaborations within a decolonial framework reveals not only the challenges posed by historical inequities but also the pathways for transformative change (Pelican et al., 2025). In doing so, scholars can cultivate a more inclusive academic landscape that honors the depth and diversity of knowledge systems while actively contributing to social justice and equity within academia and beyond.

### 5.1 Impact of Historical Narratives On Current Scholarship

The historical narratives that have shaped contemporary scholarship play a significant role in defining settler scholar positionality, particularly within the context of Indigenous studies and anti-racist education. As institutions increasingly confront the embedded nature of systemic racism, it becomes imperative for educators, especially those in predominantly white institutions, to critically examine their own curricular frameworks and pedagogical practices. For instance, the integration of an Indigenist curriculum, as demonstrated through collaborative efforts between Indigenous nurses and white settler teaching teams, illustrates the necessity of partnership in addressing historical imbalances and fostering a more equitable educational environment (Daly, 2024). This collaboration not only serves to challenge the status quo of Eurocentric narratives but also validates Indigenous epistemologies, which are essential for cultivating a more inclusive scholarly discourse. Moreover, scholars' engagement with the complexities of decolonization illuminates the multifaceted nature of educational reform. Through personal explorations of entities such as child-centered and culturally responsive education, there

emerges an understanding that the process of indigenization involves both humility and intellectual rigor (Henry, 2024).

Through autoethnographic methodologies (Tarisayi, 2023), educators can weave together personal narratives with broader socio-political contexts, allowing for a critical interrogation of colonial legacies. This approach underscores the need for placed-based (or localized), community-focused initiatives that dismantle hegemonic narratives while fostering liberatory educational practices (Lukens, 2013). Utilizing frameworks that navigate the intricacies of coloniality not only informs pedagogical choices but also promotes resilience within marginalized communities, facilitating the reclamation of knowledge and agency. In the realm of philanthropy and its relationship to historical narratives, recent scholarly critiques reveal how reconciliation discourses can inadvertently perpetuate colonial structures while simultaneously offering pathways for meaningful engagement. By examining the reconciliation change narratives within the Canadian settler philanthropy context, scholars illuminate the dissonance present in philanthropic practices that often obscure ongoing colonial violence (Trimble, 2024). This critical dialogue necessitates an exploration of alternative frameworks that transcend mere acknowledgment of past injustices, advocating instead for initiatives rooted in processes of reparations and reciprocal relationships. Such discourses challenge both philanthropic actors and scholars to address the complex legacies of coloniality within their frameworks, consequently fostering a more equitable future that honors the voices and experiences of Indigenous communities (Lukens, 2013).

## 5.2 Case Studies Of Settler Scholars In Various Disciplines

The examination of settler scholars across various disciplines necessitates an appreciation of their *positionality*, an aspect crucial for understanding how their research impacts marginalized communities (Secules et al., 2021). Case studies, such as investigations into the teaching practices of anti-racist educators, offer empirical insights into the complexities faced by settler scholars who endeavor to integrate equitable educational paradigms within systems often resistant to such change. These studies reveal, for instance, how elementary teachers of color navigate standardized curricula while simultaneously advocating for anti-racist and community-responsive pedagogy. By employing methodologies grounded in *Critical Race Theory* (Delgado and Stefancic, 2017), these educators actively disrupt conventional narratives, illustrating how anti-racist frameworks can foster critical consciousness and agency among students in K–12 settings. Their efforts underscore how teaching that resists color-evasive ideologies contributes to more equitable and inclusive learning environments (Pollack, 2024).

Parallel to these findings, settler scholars working in *professional writing disciplines* face similar challenges when embedding social justice principles into their curricula. A dissertation analyzing the integration of *anti-ableist* and *anti-racist pedagogies* within a core professional writing course demonstrates how intersectional frameworks can illuminate the pedagogical process and enhance students' critical thinking and engagement (Danvers, 2019). By revising course materials to disrupt neoliberal legacies, scholars in these fields have shown how inclusive curriculum redesigns can serve as practical interventions against the dehumanization often found in technical communication. This work contributes to a broader discourse emphasizing the necessity of cultivating inclusivity and reflexivity within professional writing programs, thereby advancing both pedagogical practice and community welfare (Gabriel, 2025).

Moreover, the *narrative research* examining the navigation of institutional reward systems by faculty of color provides additional evidence of the structural challenges that settler scholars encounter in higher education. Despite enduring systemic barriers — such as heightened scrutiny of their scholarship, racialized and gendered stereotypes, and institutional undervaluing of community-based research — these scholars demonstrate resilience and commitment to advancing social justice scholarship. The analysis of their experiences reveals the complex negotiations required to assert legitimacy within traditional academic frameworks while remaining accountable to marginalized voices and communities (Vang, 2024). These insights collectively point to the urgent need for institutions to reassess how scholarship is defined and rewarded, expanding recognition to include experiential and relational forms of knowledge that align with social justice objectives.

### 5.3 Reflexive Commentary

From a reflexive standpoint, engaging with these cases compels me — as a settler scholar — to interrogate my own position within similar structures. Observing how others navigate resistance, adapt pedagogy, and challenge institutional norms invites an awareness of my own complicity in systems that privilege certain forms of knowledge over others. This self-examination reinforces the methodological necessity of *ethical reflexivity*, reminding researchers to remain accountable to the communities their work engages and to align scholarly practices with the broader goal of transformative equity. Through such critical awareness, settler scholars can more consciously enact educational and institutional change that is both relational and just.

### 5.4. The Role of Positionality in Research

An in-depth examination of *positionality* is imperative in the context of research conducted by settler scholars, particularly regarding the intricate dynamics of power, privilege, and equity. As a settler scholar who has lived and worked across Indigenous and non-Indigenous educational and environmental contexts in Canada and the Pacific, I recognize that my own intersecting identities — shaped by race, class, gender, education, and cultural background — inevitably influence how I perceive, interpret, and engage with the research process. Acknowledging my positionality involves not only identifying these intersections but also critically assessing how they mediate my relationships with communities and shape the knowledge I co-produce. This recognition demands humility and continuous reflexivity: an ongoing awareness that my scholarly perspective, however well-intentioned, is situated within broader colonial and institutional frameworks that carry historical weight and responsibility.

In practice, this self-awareness transforms how research is conceptualized and conducted. By foregrounding positionality, I strive to co-create knowledge rather than extract it, ensuring that research processes are transparent, reciprocal, and community-engaged. In fields such as climate justice and educational equity, these positional dynamics are particularly visible. For example, as noted in prior research, the commitment to reflexivity and accountability helps prevent the replication of colonial hierarchies of truth and representation, encouraging instead the development of ethically grounded, decolonial methodologies that prioritize Indigenous and local voices (Wrigley, 2024). In my own inquiry, this means intentionally designing research frameworks that balance academic rigor with cultural responsiveness and embracing iterative dialogue with knowledge holders rather than assuming objectivity from a distance. This orientation not only mitigates the risks of epistemic dominance but also fosters *non-exploitative partnerships* in collaborative, cross-cultural endeavors.

Considering the implications of settler scholar positionality within educational contexts adds further nuance to the pursuit of equity and belonging. In British Columbia, for instance, the persistent reports of students — particularly those from racialized and Indigenous backgrounds — experiencing a lack of belonging signal the urgent need for decolonizing educational practices (Archer, 2024). For me, this acknowledgement translates into a commitment to interrogate how pedagogical models I engage with either reinforce or challenge those exclusions. By employing a Two-Eyed Seeing approach, I aim to meld Indigenous knowledge systems with Western educational frameworks to craft inclusive narratives and practices that resonate within diverse learning communities. Such engagement makes positionality a practical tool rather than a theoretical stance — it guides curriculum design, dialogue facilitation, and institutional critique toward outcomes that reflect relational accountability and shared authority. This collaborative orientation addresses historical injustices while expanding the collective understanding of identity, belonging, and equity in educational spaces (Jeung et al., 2018).

Finally, interrogating positionality also exposes the systemic inequities embedded in public institutions beyond the classroom. For example, in an educational district grappling with systemic racism, the absence of anti-racist human resources policies perpetuates discrimination and obstructs the advancement of diversity and equity (Antifaeff, 2024). From my standpoint as both an academic observer and participant in institutional processes, acknowledging positionality sharpens my capacity to analyze such inequities through critical theory and transformative leadership frameworks. This perspective reinforces that genuine institutional change requires confronting one's own embeddedness within the systems being critiqued. Addressing these “wicked problems” thus involves advocating for comprehensive policy reviews through an anti-racist and equity-focused lens, promoting inclusive

participation among educators, administrators, and community stakeholders. In this regard, positionality extends beyond personal reflection to institutional praxis—it demands that organizations themselves adopt reflexive, accountable postures, ensuring policies and practices reflect the diverse lived realities of the communities they serve. Such holistic engagement not only reinforces a shared commitment to equity but also strengthens the relational foundations upon which collaborative commitment in both educational and research contexts rests (Butin, 2007).

### 5.5 Understanding Positionality and its Implications

Positionality, in its common interpretation, plays a vital role in exploring the complexities of power and privilege within collaborative environments. This is especially relevant when considering the context of settler scholarship (Butin, 2007; Smith, 2012). Understanding one's positionality helps identify how various identities influence perspectives and interactions, ultimately impacting the dynamics within collaborative efforts. As highlighted by Butin (2007), a focused commitment to community engagement necessitates an awareness of these dynamics, which are shaped by historical and contemporary power structures. Similarly, Fine (2007) emphasizes that such awareness is crucial for facilitating social justice within educational contexts. This awareness not only fosters more equitable collaborations but also strengthens faculty and institutional commitments to meaningful community involvement (Butin, 2007; Tuck, 2009). In essence, recognizing and reflecting on positionality serves as a foundational step in navigating and addressing the intricate relationships between power, privilege, and collaboration in higher education and beyond (St. Denis, 2011). In essence, recognizing and reflecting on positionality serves as a foundational step in navigating and addressing the intricate relationships between power, privilege, and collaboration in higher education and beyond.

This recognition encompasses analyzing one's geographic, cultural, and social positioning that shapes one's perspectives and influences interactions within academic and community circles. Positionality not only informs the questions scholars ask but also dictates the methodologies employed and the interpretations made. Acknowledging these factors enables settler scholars to critically reflect on how their positionality reinforces or challenges existing inequities. For instance, incorporating Indigenous Knowledge Holders into governance structures, as highlighted by the initiatives at Big River College, illustrates a commitment to decolonization and collaborative engagement that recognizes the need for shared decision-making processes, essential for genuine reconciliation and equity as articulated in the Truth and Reconciliation Commissions Calls to Action (McCagg-Nystrom, 2024). Moreover, positionality necessitates an examination of systemic barriers and the ways in which they perpetuate social injustices within educational settings.

Settler scholars are tasked with not only acknowledging their privileges but also confronting the systemic racism that persistently operates in public institutions, such as school districts in British Columbia. The analysis of human resource policies through a critical anti-racist lens is imperative for dismantling these barriers (Jopling et al., 2025; Davis, 2020;). Adopting a place-based change model combined with a human relations approach can foster an environment where diversity, equity, and inclusion are prioritized. As noted in the initiative addressing the lack of anti-racist policies in educational practice, systemic transformation requires intentionality and a sustained commitment to change, effectively bridging the equity and belonging gaps that plague marginalized student populations (Antifaeff, 2024). Finally, the implications of positionality extend into the curriculum, compelling educators to adapt traditional pedagogies to foster a more inclusive and culturally responsive learning environment. By integrating IKS into elementary science curricula, educators can cultivate a richer understanding of ecological sustainability that resonates with diverse student identities. This transformation is not merely academic; it involves nurturing relationships with the land and community through place-based, inquiry-driven approaches that resonate with Indigenous worldviews. As demonstrated in efforts to challenge Eurocentric frameworks in science education, the validation of Indigenous perspectives not only enhances student engagement but also fosters critical thinking about identity and sustainability. Ensuring that these pedagogical shifts are accessible and beneficial for a broad range of educators is essential for implementing a curriculum that honors the interconnectedness of all knowledge systems (Potocki, 2025).

## 5.6 The Influence of Personal Background on Research Outcomes

The intricate relationship between personal background and research outcomes is underscored by how settler scholars engage with diverse communities and their lived experiences. A scholar's identity — including race, class, gender, and cultural heritage - enables a unique lens through which research inquiries are framed and conducted. For instance, scholars with Indigenous backgrounds might approach climate justice through a perspective rooted in community and collective care, as highlighted in the actions to foster critical climate justice in Australia and Western Australia, serving as an example of positionality that shapes research outcomes (Wrigley, 2024). Conversely, settler scholars may inadvertently perpetuate colonial narratives if they lack awareness of their positional shapes and the responsibilities inherent in conducting research with marginalized communities (Watson and Jeppensen, 2020). Thus, recognition and acknowledgment of one's identity become crucial for achieving not only equitable research but also for amplifying the voices and needs of those most affected by the issues under study. Moreover, the ethical implications of scholarly research necessitate an understanding of one's positionality in relation to the communities involved. The concepts of reciprocal respect and culturally responsive methodologies emerge as vital principles in this context. For example, the work focused on Indigenous wellness measures reflects a commitment to inclusive research practices that invite community perspectives to the forefront, thereby ensuring that research outcomes resonate authentically with community-defined goals (Renner, 2025). Similarly, the integration of Indigenous Knowledge Systems into educational curricula serves to dismantle Eurocentric frameworks that have historically marginalized Indigenous voices (Potocki, 2025). These examples showcase a framework wherein personal and cultural backgrounds influence research methodology and outcomes, reinforcing the necessity for scholars to approach their work with a heightened sensitivity to the historical and sociopolitical dynamics at play. Ultimately, the impact of personal background on research outcomes cannot be underestimated, particularly in the context of addressing systemic inequities prevalent in educational and health systems. Understanding the barriers faced by administrators in predominantly white institutions illuminates a critical need for equitable leadership capacity, as emphasized in frameworks that advocate for transformative leadership and collaborative approaches (Maliha, 2024). This emphasis on self-reflection and critical engagement with equity not only informs the development of action plans for systemic change but also cultivates an environment where diverse perspectives are genuinely valued. Therefore, the recognition of personal background becomes essential not only for advancing research quality but also for fostering inclusive practices that empower marginalized communities in the pursuit of social justice within academic contexts.

## 5.7 Ethical Considerations in Acknowledging Positionality

According to Shaw et al. (2019) (and previous in Butin, 2007 and Smith, 2012), acknowledging positionality is paramount in ethical research, particularly within the context of settler scholar engagement with Indigenous communities. This recognition entails an introspective examination of how one's social location — encompassing race, class, gender, and cultural affiliations—shapes the research process and its outcomes. Ethical considerations must extend beyond mere acknowledgment; they demand an active commitment to redressing power imbalances that have historically disenfranchised Indigenous voices. By embracing a collaborative framework, researchers can facilitate equitable partnerships that prioritize community perspectives. Such practices, as illustrated in projects outlined in this essay, not only enhance the validity of research findings but also foster trust and respect between scholars and Indigenous peoples. This commitment to ethical engagement serves as a catalyst for decolonization efforts, ensuring that knowledge production reflects Indigenous agency and resilience (Mad Plume, 2024).

The intersection of ethical considerations and positionality in research methodologies necessitates a critical reflexivity that interrogates the underlying assumptions of existing educational practices. As evidenced in the analysis of systemic barriers in K-12 education for Indigenous students, such an approach reveals the detrimental effects of settler colonialism, characterized by a deficit-thinking paradigm and unconscious biases (Potocki, 2025). To conduct ethical research, scholars need to actively challenge and break down colonial narratives. This means promoting leadership that values collaboration and works to create inclusive educational spaces for everyone (Ricco, 2024). This transformation not only

involves curricular adaptations that integrate Indigenous Knowledge Systems, as outlined in project initiatives, but also the cultivation of educator's critical consciousness regarding their own positionality (Barron, 2024). Concurrently, these efforts demand ongoing dialogue among stakeholders, ensuring that strategies remain responsive to community-defined needs and aspirations. Ultimately, the ethical implications of acknowledging positionality extend to the broader realm of social equity and responsibility. The necessity for accountability in research is amplified in the context of addressing historical injustices faced by Indigenous populations (Avramovic, 2024). Settler scholars must confront the complexities of their roles as beneficiaries of colonial structures while actively engaging with the imperative to dismantle them. Ethical engagement not only enhances the relevance of scholarly work but also positions researchers as allies in the pursuit of equity and justice (Balasco et al., 2024). This confluence of ethical reflection, community responsiveness, and collaborative commitment embodies a comprehensive approach to research that aspires to elevate Indigenous knowledge and promote equitable outcomes. In conducting research through this lens, scholars contribute to a collective movement toward decolonization, which fundamentally transforms the landscape of educational practice and advocacy.

### 5.8 Barriers to Achieving Equity for Marginalized Voices

Despite the growing recognition of systemic inequities, substantial barriers persist in achieving equity for marginalized voices within educational frameworks. Predominantly white administrative leadership often lacks the skills necessary to effectively address systemic racism, resulting in policies that inadequately support marginalized students. This gap in equitable leadership capabilities is compounded by deeply ingrained personal beliefs and institutional norms that hinder meaningful change. By framing this challenge through the lens of Critical Race Theory (CRT) and culturally responsive leadership, educational practitioners can better understand these complexities and implement transformative practices. Consequently, it is essential to establish a comprehensive organizational plan that equips administrators with the knowledge and tools necessary to cultivate equitable environments, thereby advancing broader social justice objectives within the educational setting (Maliha, 2024). In examining the intersection of race and workplace equity, it becomes apparent that systemic barriers extend beyond individual attitudes to institutional policies, which often reflect ingrained biases. These biases manifest within human resources practices and educational curricula that favor Eurocentric paradigms, marginalizing diverse cultural narratives. The integration of Critical Theory and transformative leadership offers a pathway to confront these systemic issues head-on. For instance, adopting an anti-racist lens when reviewing HR policies can catalyze significant shifts towards inclusive practices. By engaging in appreciative inquiry and fostering stakeholder participation, educational institutions can create dynamic frameworks aimed at promoting diversity, equity, and inclusion. A commitment to this transformative approach not only promises to enhance participation among marginalized groups but serves as a cornerstone for dismantling systemic barriers within educational systems (Antifaeff, 2024). Furthermore, successful integration of Indigenous knowledge within curricula remains crucial to achieving equitable educational outcomes yet remains stymied by the dominant Eurocentric framework. The lack of relevant and authentic representation of Indigenous perspectives often leads to a disconnect for Indigenous students, adversely affecting their academic engagement and success. As evidenced in various studies, curricula that incorporate Indigenous Knowledge Systems (IKS) and reflect culturally responsive practices can significantly enhance the learning experience. Thus, it is imperative for educators to reevaluate existing instructional approaches and curricular models to purposefully include IKS. Such an endeavor not only affirms students' identities but actively contributes to dismantling colonial narratives embedded within the educational landscape. By achieving this, educational systems can move toward more inclusive and transformative learning environments that validate diverse ways of knowing and being (Potocki, 2025; Barron, 2024).

### 5.9 Strategies for Promoting Equity in Research Practices

An effective strategy for promoting equity in research practices involves the implementation of culturally responsive methodologies that prioritize the inclusion of Indigenous Knowledge Systems (IKS). As highlighted in the project aimed at adapting elementary science curricula, incorporating IKS invites a more holistic understanding of ecological and scientific principles, thereby challenging the

Eurocentric paradigms that traditionally dominate research settings (Shackeroff & Campbell, 2007). By centering Indigenous narratives and learning styles, researchers not only validate the cultural identities of participants but also enhance engagement and retention of knowledge among diverse student populations. Consequently, collaborative projects that are grounded in place-based learning facilitate deeper connections between communities and researchers, fostering an atmosphere of respect and mutual empowerment. These approaches align with the growing recognition of the importance of community involvement as a cornerstone of ethical research practices, situating Indigenous perspectives at the heart of scholarly inquiry, as demonstrated in (Mad Plume, 2024). Moreover, addressing systemic barriers in institutional frameworks is crucial for promoting equity within research practices. The analysis of human relations policies through an anti-racist lens emphasizes the need for transformative leadership that disrupts ingrained biases and fosters diversity within research teams. By employing critical theory and an appreciative inquiry methodology, stakeholders can collaboratively develop policies that embrace equity and inclusion, as evidenced by initiatives within public school districts in British Columbia. Such frameworks not only support equitable access for marginalized groups but also facilitate the dialogues necessary for systemic change. Engaging in reflective practices allows researchers to confront their positionalities and cultivate a culture where diverse perspectives are integral to research agendas. This commitment to fostering equity is essential for dismantling historical inequities that have persisted within academic research institutions, as seen in (Antifaeff, 2024). Finally, the enactment of responsive and contextualized educational programming serves as an essential strategy for advancing equity in research practices. The design of curricula that contextualize Indigenous knowledge within existing educational standards exemplifies this approach. Research indicates that when students engage with content that resonates with their cultural backgrounds, along with the integration of land-based learning and language programming, they experience improved educational outcomes and enhanced critical thinking. This transformative approach allows for the convergence of Indigenous and Western scientific paradigms, ultimately promoting a more inclusive educational landscape. By fostering conditions for dialogue and reflexivity among educators and researchers alike, there lies an opportunity to recalibrate existing biases and norms in educational settings. Achieving this requires a commitment to continuous learning and adaptation, ensuring that research practices not only honor but actively elevate Indigenous voices, as underscored by the findings in (Potocki, 2025) and (Barron 2024).

## 6. HEUTAGOGICAL — OR SELF-DETERMINED LEARNING — PERSPECTIVES

Heutagogical—or self-determined learning—perspectives offer a powerful equity-oriented extension to participatory research by shifting the locus of control toward community participants and co-researchers (Viswanathan et al., 2004). Unlike traditional pedagogical models that presume researcher-defined objectives and hierarchies of knowledge, heutagogy foregrounds learner agency, reflection, and capability development, enabling individuals and communities to define what counts as relevant knowledge, how it is pursued, and what success looks like. This orientation aligns with equity aims because it actively counters-imposed research agendas and epistemic marginalization; instead of recipients of knowledge, community members become architects of inquiry, exercising voice in agenda-setting, methodology, and interpretation. Such empowerment deepens ethical engagement, resonating with critical pedagogical imperatives about consciousness and dialogue (Blaschke, 2012; Freire, 1970; Hase and Kenyon, 2000).

Core principles of heutagogy — double-loop learning, meta-cognition, non-linear pathway negotiation, and capacity-building for self-directed inquiry — make research more adaptive and accountable to participants' evolving needs. Embedding reflective checkpoints and iterative feedback loops ensures that the research process is co-owned, enabling recalibration when power imbalances surface or community priorities shift. When participants are supported to develop their own learning and evaluative criteria, the research partnership moves beyond extractive knowledge collection to sustained capability transfer, cultivating enduring skills for community-led inquiry and advocacy. This deepens collaborative commitment by treating Indigenous and marginalized knowledge holders not merely as informants but as co-authors of both process and products (Blaschke, 2012; Canning, 2010).

Practically, integrating heutagogical strategies into equity-oriented research means co-designing research agendas with community partners, providing scaffolding and resources for self-determined participation, and institutionalizing shared authorship and reflexive governance structures. Examples

include developing joint training modules that build community capacity in framing questions and conducting analysis, establishing “learning contracts” or mutually agreed-upon goals that can evolve, and creating open, negotiated metrics for impact and success. These mechanisms help normalize reciprocal accountability, making the research “with” rather than “on” communities, and support sustained transformation of epistemic relations — placing equitable knowledge co-creation at the heart of scholarly practice (Blaschke, 2012; Canning, 2010).

### 6.1 Integrating Heutagogical Strategies with Settler Scholar Positionality

Heutagogical perspectives deepen and give practical shape to the commitments articulated in *Settler Scholar Positionality, Equity and Collaborative Commitment in Higher Education Reform* (Vander Kloet, 2025), by explicitly redistributing epistemic agency and embedding reflexivity into co-creative processes. The document’s emphasis on positionality, shared governance, and collaborative commitment — exemplified by the institutionalization of Indigenous Knowledge Holders Councils and the framing of settler scholars as reflexive partners rather than expert dominators — creates a foundation that heutagogy amplifies. By centering self-determined learning, double-loop reflection, and negotiated learning pathways, heutagogy transforms community members and Indigenous partners from “participants” into co-authors of research agendas, evaluation criteria, and knowledge products, aligning with the paper’s call for moving beyond performative allyship toward genuine mutuality and accountability (see discussions of positionality and co-governance; Secules et al., 2021; McCagg-Nystrom, 2024; Archer, 2024). This orientation also resonates with critical and dialogic traditions — such as those articulated by Freire (1970) — and extends the document’s reflexive ethics by enabling settler scholars to continuously interrogate their own location while supporting partners’ autonomy in defining relevance and success.

The operational principles of heutagogy — meta-cognition, evolving “learning contracts”, and iterative feedback loops — serve as mechanisms to realize the transformative practices the document advocates. For example, the use of Two-Eyed Seeing and adaptive change models in the paper (e.g., third-order change through reflexive leadership and integration of Indigenous and Western knowledge systems) becomes more equitable when learning goals, metrics, and process adjustments are co-negotiated with community partners, not imposed from above (Archer, 2024; Barron, 2024; McCagg-Nystrom, 2024). Collaborative teaching and curriculum redesign efforts, such as the partnerships between Indigenous and settler nurse educators, illustrate how reflective, capability-building engagement leads to shared ownership of both process and outcomes—precisely the kind of capability development heutagogy foregrounds (Daly and Kelly, 2024; León, 2025). Embedding these iterative, self-directed elements into research and reform practices helps surface and recalibrate power imbalances in real time, making equity adaptive rather than static.

In the context of higher education reform, integrating heutagogical strategies with the settler scholar positionality framework signals a shift from consultative inclusion to co-determined transformation. Co-designing research agendas, establishing evolving shared learning goals, and cultivating institutional scaffolds that support autonomous community inquiry operationalize the paper’s vision of equity as shared governance and sustained collaborative commitment (illustrated in the collaborative commitment and decolonial reflexivity sections. This approach also reinforces the imperative to dismantle hegemonic structures — visualized in the governance paradigms and equity frameworks — by normalizing reciprocal accountability and enabling indigenous epistemologies to inform what counts as legitimate knowledge and impact (Trimble, 2024). Heutagogy thus helps settler scholars enact the reformist aspirations in the document: continually interrogating their own positionality while redistributing epistemic power, making equity not only a descriptive goal but a generative, practice-embedded reality.

## 7. COLLABORATIVE COMMITMENT IN SCHOLARSHIP

In the pursuit of equitable scholarship, a collaborative commitment emerges as a foundational pillar that seeks to deconstruct traditional hierarchies within academic research. This paradigm shift is particularly salient in the context of settler scholarship, where scholars must acknowledge their positionality and its implications on research practices. By fostering genuine partnerships with

marginalized communities, researchers can not only enhance the reliability of their findings but also ensure that the voices of those often left behind are brought to the forefront. For instance, initiatives like Measuring Wellness Through Indigenous Partnerships underscore the necessity of community involvement in shaping research agendas, aligning closely with principles of ethical scholarship (Mad Plume, 2024; King, 2023). Such collaborative frameworks challenge prescriptive notions of representation, promoting a dialogue where power dynamics are critically examined and reconfigured, thereby fostering an environment conducive to mutual growth and understanding. The ethical dimensions of collaborative scholarship demand a reflexive approach, where scholars continuously interrogate their positionality in relation to their research subjects. This necessity is reinforced by critical engagements with decolonial feminist perspectives that advocate for recognizing the complex interplay between researcher and participant (Sims, 2023; Cueva et al, 2024). As articulated in discussions surrounding fieldwork, scholars must navigate the intricate landscapes of their own identities and the implications of their research methodologies within these contexts (Cueva et al., 2024). By embracing a commitment to reflexivity and anti-oppressive practices, researchers can not only enrich their understanding of the field but also work towards dismantling the entrenched systems that perpetuate inequity within academic spaces (Figure 3).

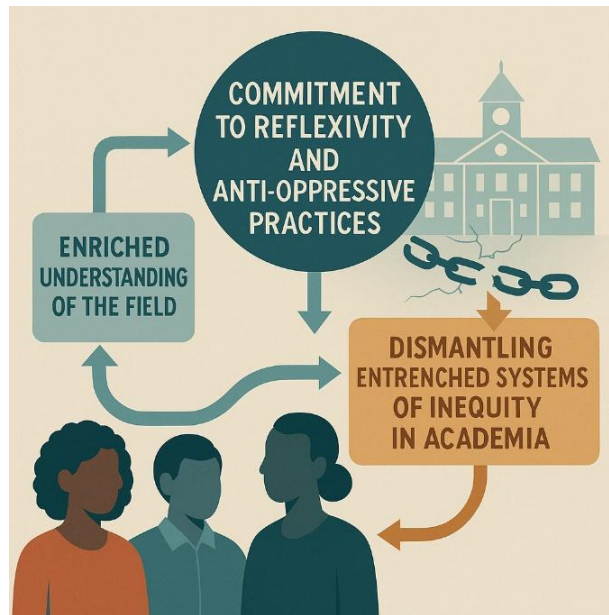


Figure 3: Reflexive Anti-Oppression in Academia: Enriching Knowledge While Dismantling Inequity. Source; OpenAI (2025, August 1). *Commitment to reflexivity and anti-oppressive practice: Pathways to enriched understanding and systemic change* [Digital infographic]. Generated with DALL·E via ChatGPT.

Figure 2 encodes a cyclical, generative relationship: at its core is a commitment to reflexivity and anti-oppressive practice, which functions both as catalyst and grounding ethos. From that core arise two interlinked outcomes — an enriched understanding of the field and the dismantling of entrenched systems of inequity in academia — and the arrows imply reciprocal reinforcement. Reflexivity and anti-oppressive attention sharpen researchers’ awareness of their own positionality, assumptions, and the power dynamics embedded in knowledge production, which deepens their conceptual and practical grasp of the field. That deeper understanding then feeds back, strengthening and refining the commitment, making it more informed and responsive. Simultaneously, anti-oppressive praxis works to break structural barriers (symbolized by the cracked chains beneath the academic building), creating space for more inclusive epistemologies; as those systems loosen, they enable further learning and more effective reflexive interventions.

The presence of diverse researcher silhouettes anchoring the diagram emphasizes that people—and relationships—are the agents animating the loop: equity and transformation aren’t abstractions but enacted through human engagement, dialogue, co-design, and accountability. The broken chains and

institutional imagery signal that change is not merely individual (internal reflection) but structural: anti-oppressive commitments must lead to tangible shifts in governance, authorship, curricular authority, and who defines value. The mutual arrows suggest that dismantling inequity also enriches understanding — once oppressive filters are removed, previously marginalized perspectives surface, offering new insights that again inform more sophisticated, contextually grounded reflexivity.

Interpretively, the model functions as both diagnostic and aspirational. Diagnostic, in that it helps identify where a research practice might be stuck (e.g., reflexivity performed superficially without structural change, or equity rhetoric without deep learning) and aspirational, in that it portrays an iterative pathway toward more just scholarship. For application, the figure invites concrete moves: embedding structured reflective moments, co-creating metrics with marginalized partners, institutionalizing shared governance, and using feedback loops to adapt when power imbalances re-emerge. It also implicitly warns against performative versions — without mutual reinforcement and structural dismantling, the cycle stalls. The dual outcome focus will help readers grasp it as a model for sustained, practice-embedded equity work in higher education.

This critical stance propels a shift from viewing the researcher's role as autonomous to recognizing it as inherently collaborative, highlighting the importance of community-led agendas in shaping research trajectories. Furthermore, the integration of diverse epistemologies into scholarship serves as a catalyst for fostering inclusive academic environments. Insights stemming from collaborative commitments help articulate methodologies that are sensitive to intersectional identities and systemic inequities. For instance, the application of Movement-based Participatory Action Research (Mb-PAR) in climate justice organizing illustrates how community knowledge can inform academia, ultimately fostering collective care and relational justice practices (Wrigley, 2024). This intersectional approach not only broadens the scope of inquiry but also enhances the relevance of scholarly outputs in addressing pressing societal challenges. By foregrounding the lived experiences of marginalized populations, scholars can cultivate a transformative ethos that elevates inclusive collaboration as a normative principle within their research endeavors, thus contributing to a more equitable scholarly landscape pertinent to the future of innovation and advocacy.

### 7.1 Importance of Collaboration with Indigenous Communities

The importance of collaboration with Indigenous communities transcends mere engagement; it embodies a fundamental shift in research ethics and practices, fostering equitable relationships that reflect the distinct needs and aspirations of these communities. Such collaboration is paramount in advancing research initiatives within Indigenous health, as illustrated in the projects comprising my portfolio. For instance, the scoping review entitled *Measuring Wellness Through Indigenous Partnerships* emphasizes the necessity of community involvement in defining wellness measures, which subsequently informs culturally responsive methodologies crucial for sustainable outcomes (Mad Plume, 2024). By adopting collaborative frameworks, scholars not only acknowledge Indigenous knowledge systems but also empower communities to lead the discourse on their health realities, thereby facilitating a path toward reconciliation and shared governance in research initiatives. Furthermore, the integration of the CARE Principles for Indigenous Data Governance underscores the nuanced relationship between data stewardship and Indigenous communities, serving as a critical point of reference for scholars engaged in collaborative work. The Data Services for Indigenous Scholarship and Sovereignty (DSISS) project articulates key themes such as ownership, trust, and relational accountability, which are essential for cultivating meaningful engagements with Indigenous data (Belarde-Lewis et al., 2024). It becomes evident that long-term sustainability of research outcomes demands a capacity for researchers to navigate these intricate relationships, ensuring that Indigenous voices are not only heard but are integral to the research process. Engaging Indigenous scholarship necessitates a commitment to building trust and respecting the interrelationships inherent within Indigenous ways of knowing, promoting an atmosphere of reciprocal accountability among collaborative partners. Finally, the aspiration to decolonize educational practices within secondary schools exemplifies the urgent need for collaborative methodologies that honor Indigenous perspectives. The two-eyed change model figure 3 showcased Archer's (2024) *Dissertation-in-Practice* highlights a transformative approach that synergizes Western educational systems with Indigenous principles, thereby addressing the equity and belonging gap prevalent in contemporary education (Archer, 2024).

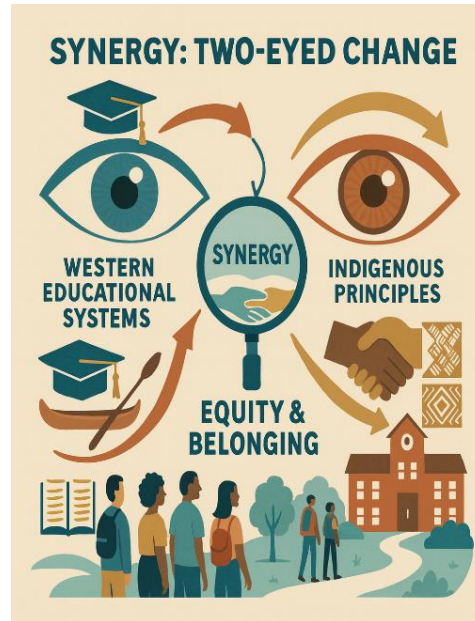


Figure 4: Integrating Western Educational Systems and Indigenous Principles to Advance Equity and Belonging. Source: Orcherton (2023b). *Synergy: Two-eyed change—Integrating Western educational systems and Indigenous principles to advance equity and belonging* [Conceptual infographic]. Generated with DALL·E via ChatGPT (OpenAI).

Figure 4 visualizes the “Two-Eyed Change” model as a binocular perspective where one eye represents Western educational systems and the other Indigenous principles. Their convergence in the central lens — labeled “Synergy” — symbolizes the transformative integration of both epistemologies (Orcherton, 2023a). This blended sight produces enhanced outcomes in equity and belonging, depicted by the pathway leading toward an inclusive academic institution and diverse learners. Arrows and connecting elements imply mutual reinforcement: the dialogic engagement between knowledge systems enriches understanding while simultaneously reshaping institutional practices to be more just and responsive. By depicting the two knowledge traditions as complementary rather than oppositional, the model emphasizes relationality, co-design, and shared agency. The handshake, traditional motifs, and academic iconography signal partnership and respect, while the students walking toward the institution represent the lived impact — students entering spaces made more inclusive through that synergistic change. In sum, the illustration makes visible how embracing both “eyes” together allows reform efforts to see more fully and act more equitably, closing the belonging gap that single-lens approaches often perpetuate.

Such practices extend beyond superficial inclusion, seeking to weave Indigenous narratives into the broader educational fabric through inquiry-driven and culturally sustaining pedagogies. This alignment not only validates Indigenous identities but also cultivates scientific literacy that respects and reflects diverse epistemologies, fostering an inclusive environment for all learners. The implications of these collaborative efforts resonate throughout the academic landscape, emphasizing the imperative for a shared commitment to equity in research and education.

## 7.2 Models of Successful Collaborative Research

Successful collaborative research models are essential for promoting equitable outcomes, particularly in the context of settler scholar positionality (Secules et al., 2021). Central to these models is the commitment to decolonization and the recognition of Indigenous epistemologies in research practices. By integrating transformative leadership approaches, researchers can dismantle colonial mental models that have historically marginalized Indigenous voices and experiences. For instance, employing Stroh’s 4-stage change model (Barron, 2024), allows for a structured approach in achieving third-order change, which is crucial for reframing leadership practices in educational settings. This model highlights

the importance of collaborative visioning among educational partners, fostering an environment where all stakeholders engage in transformative learning processes. The focus on reflexivity and dialogic methods further enhances participants capacity to critically evaluate and reshape their mental frameworks, ensuring that collaborative efforts align with the principles of inclusivity and equity as articulated in the Calls to Action from the Truth and Reconciliation Commission (Barron, 2024). In the realm of post-secondary institutions, the institutionalization of Indigenous Knowledge Holders Councils (IKHC) serves as a pertinent model for successful collaborative research. By integrating IKHC into governance structures, institutions can brazenly address the imperative of educational reconciliation as highlighted in the Truth and Reconciliation Commissions Calls to Action (McCagg-Nystrom, 2024).

This tri-cameral approach seeks to braid critical Indigenous perspectives with existing institutional frameworks, thus promoting a dual consciousness that respects both Indigenous and Western epistemologies (McCagg-Nystrom, 2024). A noteworthy aspect of this model is its grounding in culturally responsive and transformative leadership practices, which augment institutional legitimacy and foster a genuine commitment to equity, diversity, and inclusion. The emphasis on collaborative governance and shared decision-making processes not only enhances the integration of Indigenous knowledge but also contributes to long-term institutional success, allowing Indigenous faculty, staff, and students to thrive within a system that acknowledges their diverse narratives and experiences. Moreover, a critical analysis of systemic barriers reveals the necessity for collaborative research models that prioritize anti-racist practices and focus on the promotion of equity and belonging within educational settings. The absence of systemic anti-racist human relations policies creates significant challenges, reinforcing inequities and perpetuating the exclusion of marginalized voices (Antifaeff, 2024). By utilizing an appreciative inquiry framework (Watkins et al., 2016) in conjunction with a place-based change model (Cutter et al., 2008) researchers and educators can collaboratively address these existing disparities and foster an inclusive culture. For example, professional learning networks and inquiry pilots, grounded in Indigenous principles and culturally sustaining pedagogies, create avenues for meaningful engagement and transformative learning experiences. These collaborative frameworks advocate for transparency in communication and support ongoing evaluation processes, thereby enabling stakeholders to iteratively refine their strategies and practices. Ultimately, models that interweave diverse perspectives are essential for dismantling the hegemony of Eurocentric practices in education, ensuring that all members of the educational community feel a profound sense of belonging (Archer, 2024).

### 7.3 Challenges Faced in Establishing Genuine Partnerships

Establishing genuine partnerships between settlers<sup>2</sup> and Indigenous communities presents a complex array of challenges, primarily stemming from historical trust deficits and ingrained power imbalances. The legacy of colonialism has engendered a profound skepticism among Indigenous peoples regarding the intentions of settler scholars, often resulting in hesitance to engage meaningfully in collaborative efforts. Such sentiments are exacerbated by experiences of tokenism, where Indigenous contributions may be solicited without genuine integration into decision-making processes. As a result, any attempt to foster partnerships must confront and dismantle these historical inequities. An awareness of settler scholar positionality is essential in navigating these challenges, as it requires a critical examination of one's role, motivations, and the potential impact of research on Indigenous communities, thereby facilitating the development of equitable and respectful collaborative engagements (Mad Plume, 2024). In addition to historical mistrust, logistical barriers often hinder the formation of authentic partnerships. Differences in organizational cultures, operational mandates, and communication styles can create significant misunderstandings that complicate collaborative initiatives. Settler scholars may

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<sup>2</sup> Here, "settlers" refers to people or groups who have originated from outside the Indigenous communities in the area and have established permanent residence or governance there, typically within a colonial or settler-colonial context. This term is used to distinguish non-Indigenous newcomers and their institutions from Indigenous peoples and their traditional sovereignty. In the given context, the term is likely being used to examine how genuine partnerships can be built between these non-Indigenous settlers (and their communities/organizations) and Indigenous communities, acknowledging several dynamics: Historical trust deficits: past actions, policies, and violence by settler governments or settlers themselves have eroded trust with Indigenous communities; Power imbalances: structural advantages held by settler societies (legal, economic, political, and cultural) compared with Indigenous communities, which can impede equitable collaboration and Relationship dynamics: the need to move beyond token partnerships toward co-creation, shared decision-making, and recognition of Indigenous sovereignty, knowledge systems, and rights.

approach partnerships with a structured, results-oriented mindset, while Indigenous communities might prioritize relationship-building and holistic approaches to projects. This dissonance can lead to frustrations on both sides, ultimately impairing the potential for meaningful collaboration. Moreover, the constraints of institutional frameworks often resist the flexibility needed to accommodate the diverse needs and perspectives of Indigenous partners. Addressing these disparities necessitates a commitment to adaptive leadership models that emphasize co-creation and shared governance, ensuring that the voices of Indigenous stakeholders are not only heard but actively shape project outcomes (Avramovic, 2024). The successful establishment of genuine partnerships also depends on addressing the systemic injustices inherent in the research landscape. Many Indigenous communities articulate that existing research frameworks may perpetuate a colonial narrative, failing to reflect their unique contexts and aspirations. Consequently, settler scholars are tasked with articulating a clear social justice agenda that critically examines how research practices can align more closely with Indigenous epistemologies and priorities. This requires a concerted effort to implement policies that not only seek to rectify historical inequities but also empower Indigenous voices in the creation of knowledge. Utilizing transformative leadership practices, as illustrated in recent initiatives, can facilitate such a shift by fostering an environment of reciprocity and mutual respect. By positioning Indigenous knowledge systems alongside academic research strategies, scholars can engage in meaningful partnerships that prioritize equity and collaborative commitment (Barron, 2024; Miller, 2024).

## 8. THE IMPACT OF SETTLER SCHOLAR PRACTICES

The practices of settler scholars often reflect a paradoxical relationship with the traditions and knowledge systems of Indigenous communities they study. While settler scholars engage in diverse academic inquiries aimed at addressing historical inequities, their methodologies frequently remain enmeshed within a Eurocentric framework that prioritizes Western epistemologies. Such frameworks perpetuate systemic racism and contribute to the marginalization of Indigenous voices in both research and practice. For instance, the acknowledgment of the Truth and Reconciliation Commissions Calls to Action (#62) (Jewell and Mosby, 2022) underscores a critical move towards integrating Indigenous knowledge within educational systems that have historically sidelined these perspectives (McCagg-Nystrom, 2024). However, settler scholars must critically assess their positionality and the implications of their practices to avoid enacting a form of intellectual colonialism, thereby reinforcing existing power imbalances rather than dismantling them. Moreover, the capacity of settler scholars to engage in meaningful collaboration with Indigenous communities hinges on their commitment to ethical research practices that prioritize reciprocity and community engagement. An ethical research framework necessitates recognizing and addressing the historical and ongoing impacts of colonization, specifically in terms of health, education, and policy initiatives. By implementing culturally responsive methodologies, settler scholars can facilitate genuine partnerships that honor Indigenous knowledge systems and practices (Mad Plume, 2024).

The responsibility to foster such collaborations is further accentuated by the need for accountability in institutional practices, as demonstrated by efforts to create spaces for the inclusion of Indigenous Knowledge Holders within academic governance (McCagg-Nystrom, 2024). Effective advocacy for Indigenous equity within research contexts requires settler scholars to engage in transformative leadership, thereby fostering environments where all voices are valued and heard. Finally, the advancement of equity and belonging within educational institutions remains a paramount challenge for settler scholars who must navigate the complex landscape of systemic inequities. This challenge is particularly evident in secondary education, where approximately half of students express feelings of disconnection from their schools. In addressing this equity and belonging gap, settler scholars can adopt a two-eyed approach that combines Indigenous principles with Western pedagogical frameworks to create inclusive learning environments. Initiatives such as professional learning networks for educators and inquiry-based collaborative projects can strengthen the integration of diverse cultural perspectives. Ultimately, the commitment to reshape scholarly practices toward a more equitable paradigm necessitates ongoing reflection and adjustment by settler scholars to ensure that their contributions genuinely serve to uplift marginalized communities rather than inadvertently reinforce existing disparities.

## 8.1 Consequences of Ignoring Settler Positionality

The implications of neglecting settler positionality in academic discourse reveal profound consequences for both scholarship and societal justice (King, 2023). Ignoring this critical vantage point results in a perpetuation of epistemic injustice, where Indigenous perspectives are either marginalized or wholly excluded from discussions that impact their communities. This oversight not only diminishes the potential for inclusive dialogue but also perpetuates systemic inequalities that have far-reaching effects on Indigenous populations. The implications extend into educational frameworks, wherein settler scholars may unwittingly endorse narratives that reinforce colonial structures instead of advancing decolonization and equity. Such omissions underscore the need for a paradigm shift in how academia addresses settler identities, demanding an integrated approach that acknowledges historical contexts and advocates for collaborative commitments to equity and justice. In light of this, engaging with (Molla, 2025) becomes essential, as it critiques narrow definitions of academic work that may inadvertently uphold these colonial legacies. The consequences of disregarding settler positionality are particularly evident in K-12 educational settings, where policies often fail to account for the lived realities of Indigenous students. The influence of settler colonialism manifests through biased pedagogical practices and leadership attitudes that sustain achievement gaps for Indigenous learners, as explored in (Barron, 2024). Such systemic barriers compromise the educational experiences of Indigenous youth, undermining their potential for success within a structure that is fundamentally inequitable. Furthermore, the absence of settler accountability in these conversations diminishes the ethical imperatives that surround educational reform, wherein settler scholars must take a proactive stance in dismantling colonial legacies embedded in educational practice. A collective re-evaluation of leadership approaches, particularly through critical and transformative frameworks, is crucial in cultivating a more equitable educational landscape that prioritizes belonging and agency for Indigenous students, aligning with the urgent call for systemic change (Beresford-Dey, 2025). Moreover, according to King (2023) and Weuffen (2024), ignoring settler positionality hinders the efficacy of anti-racist frameworks within educational institutions. The limited understanding of intersectionality in this context can result in generic applications of ethnic studies curricula that fail to resonate with or adequately address the complexities of marginalized communities, as illustrated in (León, 2025; Manglicmot, 2025). Such disconnections render the commitment to inclusivity superficial, deterring meaningful engagement with diverse epistemologies and pedagogical practices. Employing a two-eyed approach, which harmonizes Indigenous principles with Western systems thinking, cultivates space for genuine dialogue and exploration of anti-racist methodologies, as detailed in Archer (2024); Constant-Inglis (2023). Anecdotal to this, Sahoo (2025) acknowledges the multifaceted nature of identity and positionality not only enriches educational discourse but also enhances the collective capacity to devise strategies that promote transformative learning experiences. Ultimately, an intentional focus on settler positionality serves as a catalyst for developing more nuanced and authentic educational paradigms that reflect the diverse realities of all learners, thereby fostering equity and commitment to social justice.

## 8.2 The Role of Settler Scholars in Perpetuating Inequities

In the discourse surrounding the *role of settler scholars* (Johnson and Endres, 2021), it is essential to recognize how their positionality can inadvertently perpetuate systemic inequities. Settler scholars, often situated within predominantly white institutions, may adhere to a framework that prioritizes their own narratives while marginalizing Indigenous perspectives. This phenomenon is exemplified by notions such as Midwest Nice, which, while seemingly benign, can serve to silence critical anti-racist dialogues — thereby reinforcing existing power structures. By adopting a stance of neutrality or civility, settler scholars risk enacting a form of academic gatekeeping that stifles the necessary discussions around privilege, race, and responsibility in addressing historical injustices (Homan, 2025). Consequently, their scholarship may unwittingly contribute to the erasure of Indigenous voices and experiences, stalling progress towards achieving equitable academic landscapes that are responsive to the needs of marginalized communities. A further examination reveals how the predominant narratives crafted by settler scholars risk homogenizing the complex realities faced by marginalized communities. Through research outputs often lacking in community engagement, these scholars reproduce structural inequalities that undermine the resilience and agency of Indigenous populations. The intersections of

environmental justice and urban development illustrate this dilemma, highlighting how settler narratives often neglect crucial community-specific contexts that inform residents lived experiences. For instance, *gentrification policies*— though ostensibly framed as urban renewal — can displace marginalized groups, exacerbating vulnerabilities that settler scholars may overlook (Machado-Escudero et al., 2025). By failing to interrogate these dynamics critically, they reinforce a cycle of dispossession, as their work may not adequately address the ongoing impacts of colonial legacies within these settings. This necessitates a re-evaluation of how scholarship is produced and disseminated, underscoring the need for collaborative, community-driven frameworks that genuinely reflect diverse experiences. Engaged scholarship posits a transformative potential that, when actualized effectively, could counteract the perpetuation of inequities.

Settler scholars (it seems) must grapple with the discontents associated with this approach. These can range from narrow definitions of academic work, which often privilege Eurocentric knowledge, to the emotional and intellectual toll taken by engaging in public discourse (Molla, 2024). Without institutional support systems and an ethos of co-learning, settler scholars may experience burnout, potentially abandoning critical collaborations that could contribute to social change. Furthermore, initiatives demonstrating participatory methods, such as community-based photovoice projects, emphasize this necessity for systemic change (Molla, 2025; Rosas et al., 2024; Bell and Lewis, 2023 and Yoon et al., 2018). By centering the voices of marginalized groups, these collaborative efforts allow for a reclamation of agency and endorse a vision of social equity that challenges the oppressive legacies of settler knowledge production. Thus, a commitment to equity must accompany a re-evaluation of positionality, fostering partnerships grounded in mutual respect and shared purpose.

## 9. FUTURE DIRECTIONS FOR SETTLER SCHOLARS

Future directions for settler scholars necessitate a profound and sustained commitment to integrating Indigenous methodologies into academic research, thereby fostering forms of collaboration that explicitly challenge colonial paradigms and institutional inertia. This analysis extends current literature on settler positionality by moving beyond theoretical acknowledgment of privilege to emphasize how positional reflexivity can *operationalize* change within higher education systems. As outlined in contemporary discourse, settler scholars must prioritize ethical engagement with Indigenous communities — ensuring that research practices not only recognize but also activate and sustain Indigenous knowledge systems as legitimate and coequal sources of epistemic authority. This focus on praxis marks a distinct contribution to existing scholarship: it situates positionality as a transformative tool for reshaping institutional norms rather than merely as a reflective stance.

This transition toward ethical, relational scholarship entails revising curricula to integrate Indigenous perspectives and values into pedagogical and research frameworks. Projects such as *Measuring Wellness Through Indigenous Partnerships* (Mad Plume, 2024) demonstrate the value of collaborative methodologies that place community-defined notions of wellness and success at the center of inquiry. These initiatives underscore the necessity of community involvement in defining research priorities, aligning academic inquiry with the cultural values and relational ethics integral to Indigenous worldviews. By highlighting these examples, this analysis reinforces that decolonial research must move from consultation to co-creation, thereby advancing a paradigm of shared authorship and accountability that expands on earlier theoretical work in decolonial studies.

Emphasizing institutional commitments to reconciliation is equally critical for settler scholars seeking to transform higher education environments into spaces of collaborative commitment and mutual respect. As articulated in the Truth and Reconciliation Commission's *Calls to Action*, post-secondary institutions bear a responsibility to restructure their approaches in alignment with Indigenous epistemologies and governance practices (McCagg-Nystrom, 2024). This analysis adds to current literature by identifying specific pathways — such as integrating Indigenous Knowledge Holders Councils into institutional governance — as pragmatic strategies for indigenization. These governance innovations illustrate a shift toward tri-cameral decision-making models that actively include local Indigenous voices, thereby bridging epistemological and administrative divides. The practical implication is clear: institutional reform must embed reconciliation not as an aspirational statement but as a structural reconfiguration of how authority, expertise, and accountability are shared. This approach advances the discourse on higher education reform by illustrating how positional awareness can guide tangible institutional design.

Moreover, settler scholars can employ transformative leadership frameworks to address the systemic barriers that perpetuate exclusion and inequity within educational contexts. As highlighted in the discourse on anti-racist pedagogy, there is an ongoing need for educators to engage in continuous professional development and critical self-reflection, deepening their capacity to enact culturally responsive and socially just pedagogies (Maliha, 2024). This analysis contributes to current debates by linking positionality to leadership praxis, suggesting that reflexive awareness can serve as the foundation for organizational transformation. Through initiatives emphasizing critical consciousness, settler scholars can facilitate sustained dialogue that interrogates inequitable practices and fosters institutional accountability.

### 9.1 Implementing Solutions

In many cases, this requires collaborative models, such as community partnerships in ethnic studies pedagogy, exemplifies how equity can be operationalized within curriculum and governance systems (Manglicmot, 2025). These pathways not only empower marginalized voices but also redefine the role of settler scholars as co-advocates for social justice, advancing the shift from performative allyship to relational solidarity. Consequently, this work contributes to the growing literature that frames decolonial research as both methodological and institutional transformation, enriching the discourse on equity, belonging, and systemic reform. By situating positionality as a dynamic force — one that informs ethics, pedagogy, and leadership — this analysis underscores its potential to produce structural change in higher education that is reflective, inclusive, and enduring (Macoun and Strakosch (2013).

### 9.2 Recommendations for Ethical Research Practices

The ethical conduct of research, particularly in studies involving marginalized communities, necessitates a comprehensive understanding of both the implicit and explicit power dynamics at play (Andress et al., 2020). Researchers, especially settler scholars, must critically analyze their positionality and how it can influence participants experiences and the data collected. Recommendations for ethical research practices include adopting a reflexive approach, which encourages scholars to continuously reflect on their biases and privileges throughout the research process. Additionally, employing participatory frameworks, such as Movement-based Participatory Action Research (Wrigley, 2024), can enhance engagement with community members and ensure their voices are integral to the research narrative (Wrigley, 2024). This method allows for co-creation of knowledge, positioning the study within the lived realities of those it aims to serve, thereby promoting a more equitable research environment. Furthermore, ethical research practices must prioritize the principles of reciprocity and community benefit (McCubbin and Moniz, 2014). Settler scholars should engage in meaningful partnerships with Indigenous and marginalized communities, ensuring that research outputs are accessible and beneficial to those communities. Ethical obligations extend beyond data collection; they encompass the translation of research findings into tangible actions that address the identified needs of the studied populations. Recommendations to enhance community benefit may involve the establishment of Community Advisory Boards or the integration of Indigenous Knowledge Holders into governance structures within academic institutions (McCagg-Nystrom, 2024). Additionally, addressing institutional barriers to the incorporation of such perspectives is crucial. By fostering genuine collaboration, researchers substantiate their commitment to equity and social justice, thereby enhancing the impact of their work. Lastly, it is imperative for researchers to incorporate anti-oppression frameworks (Yee et al., 2025) in their methodologies. This approach acknowledges systemic inequalities linked to race, gender, and class that shape the research landscape. By integrating critical, intersectional perspectives, scholars can disrupt dominant narratives and challenge the underlying structures that contribute to inequality and marginalization within research (Gabriel, 2025). The inclusion of Indigenous knowledge systems (IKS) and anti-ableist pedagogies (Nieminen and Pesonen, 2022) in the curriculum and research design can also broaden the epistemological horizons and challenge conventional academic assumptions (Phillips, 2025). Ultimately, ethical research practices must reflect a commitment to inclusivity, social justice, and collaborative commitment while continuously seeking to dismantle the inequities inherent in traditional

research paradigms. This alignment not only advances scholarly integrity but also cultivates an academic environment conducive to genuine transformation.

### 9.3 The Necessity of Ongoing Education and Reflection

The necessity of ongoing education and reflection is particularly salient in addressing the inadequate educational outcomes for Indigenous students within K-12 settings. Critical theory suggests that educational systems in Alberta, as analyzed in Three Bear Hills School Division, perpetuate systemic barriers rooted in settler colonial practices that adversely affect Indigenous students' graduation and post-secondary aspirations (Barron, 2024). The enduring presence of deficit thinking and bias illustrates the imperative for educators to engage in reflective practices that question their preconceived notions and institutional frameworks. By adopting a critical consciousness, informed by transformative learning theory, school leaders can reframe their leadership models, thereby dismantling colonial mental models entrenched in educational settings. This shift is not merely a "band-aid fix" or remedial; it is foundational for fostering equitable educational outcomes, highlighting the urgent need for continuous professional development rooted in equity and collaboration. Equity-focused pedagogies necessitate the collaborative commitment of educators to confront the complexities of systemic racism embedded within their institutions. The exploration of anti-racist and Indigenist curricula, such as those developed through partnerships between Indigenous community nurses and white settler nurse educators, serves as a compelling case study of innovation in teaching strategies (Daly & Kelly, 2024). In these models, ongoing education fosters a shared understanding that enriches pedagogical approaches while promoting a culture of inclusivity. However, the challenges inherent in these collaborations underscore the need for persistent self-reflection among educators. The development of confidence and competence in delivering content that resonates with diverse populations demands a sustained commitment to learning, dialogue, and mutual growth. Such collaborative frameworks not only enhance educational practices but also cultivate respect for Indigenous Knowledge Systems, ultimately contributing to the decolonization of educational curricula. Integrating culturally responsive teaching within mainstream educational frameworks effectively addresses the longstanding equity and belonging gap experienced by many students, particularly in the context of secondary education. Research focusing on decolonizing practice reveals a pressing need for educational leaders to adopt two-eyed perspectives that incorporate both Indigenous principles and Western systems thinking, thereby establishing inclusive environments for all learners (Archer, 2024). By implementing inquiry-driven, place-based lessons that align with Indigenous perspectives, educators promote authentic engagement with knowledge and foster students' connection to their communities (Potocki, 2025). Reflection serves as an indispensable tool in this transformation, enabling educators to assess and adapt their methodologies continually. As they engage in this iterative process, they must remain aware of how their positionality shapes their interactions with students, reinforcing the significance of ongoing education and reflection as catalysts for genuine equity and collaborative commitment within the educational landscape.

### 9.4 Building Sustainable Relationships with Indigenous Scholars

The process of building sustainable relationships with Indigenous scholars necessitates a foundational understanding of the historical contexts and contemporary realities that shape these interactions. Engaging meaningfully with Indigenous scholars requires an acknowledgment of the legacies of colonialism and systemic racism that have permeated academic institutions. As highlighted in the Truth and Reconciliation Commissions calls to action regarding educational reform, there is a pressing need to incorporate Indigenous perspectives into the fabric of higher education. Institutions must not only rectify past injustices but also cultivate environments where Indigenous knowledge systems are respected and integrated into curricula. This approach reflects a transformative shift in scholarly paradigms, moving away from traditional Eurocentric frameworks, thereby fostering an inclusive academic landscape that values diverse epistemologies and methodologies (Daly & Kelly, 2024). To effectively foster collaborative commitments, it is crucial for settler scholars to confront their positionality within the academic hierarchy. This involves recognizing the privileges associated with their identities while actively seeking partnerships that empower Indigenous scholars. Collaborative teaching and research initiatives should be designed with careful consideration of equitable power

dynamics, ensuring that Indigenous voices lead the discourse on their own knowledge systems. Empirical evidence indicates that collaborative teaching strategies, whereby Indigenous and non-Indigenous educators work together, yield mutually beneficial outcomes that enhance the intellectual rigor of academic programs (Daly, 2024). Such cooperative endeavors enable settler scholars to cultivate a deeper understanding of Indigenous methodologies and perspectives, ultimately enriching the educational experiences of all participants involved. Sustainable relationships with Indigenous scholars also necessitate a commitment to ongoing reflexivity in research practices. Knowledge exchange must be approached with a framework that prioritizes ethical engagement and respect for Indigenous sovereignty. This requires settler scholars to examine their research questions, methodologies, and intended outcomes critically, ensuring they align with the community-defined aspirations of Indigenous partners (Weir et al., 2024). By honoring the political and legal status of Indigenous communities, scholars can shift their epistemological frameworks to engage fully with Indigenous knowledges on their own terms. Furthermore, the integration of Indigenous Knowledge Holders Councils within academic governance structures serves as a vital mechanism for ensuring that Indigenous perspectives are not only included but embedded in institutional policies (McCagg-Nystrom, 2024). This comprehensive approach not only contributes to a higher standard of academic integrity but also supports genuine partnerships founded on trust, equity, and mutual respect.

## 10. CONCLUSION

In concluding this exploration of settler scholar positionality within the framework of equity and collaborative commitment, it becomes increasingly clear that transformative change in educational systems is not merely aspirational; it is an imperative. The entrenched systemic barriers influencing Indigenous students' educational outcomes, highlighted through various critical lenses, necessitate a profound re-evaluation of leadership practices. For instance, the application of Stroh's 4-stage change model within educational settings serves as a strategic mechanism to dismantle colonial mental models and to foster environments conducive to third-order changes, such as decolonization of leadership and curriculum (Barron, 2024). As educational leaders engage in reflective practices and appreciate the diverse experiences brought forth by co-creators of knowledge, they enhance their capacity for developing a shared vision that promotes equity and belonging in schools (Archer, 2024). Ultimately, this multifaceted approach underscores the moral imperative of prioritizing the needs of marginalized communities within educational discourse. Furthermore, the significance of cultivating a sense of belonging in educational environments cannot be overstated, particularly in relation to the academic achievement and psychological wellbeing of all students. Current findings illustrate a stark equity and belonging gap among secondary students, mandating that educational leaders integrate Indigenous and culturally sustaining pedagogies into their practices (Archer, 2024). By embracing a two-eyed change model that interweaves Indigenous principles with Western systems thinking, school leaders can effectively address the problem of practice associated with belonging and equity for diverse student populations. This approach not only acknowledges the prevailing Eurocentric narratives within educational institutions but actively seeks to displace them by facilitating authentic relationships and community engagement. The commitment to decolonizing educational practices offers an opportunity to reshape systems in a manner that genuinely reflects the values and aspirations of all community members (Johnson & Endres, 2021). Finally, the complexities surrounding climate justice, particularly within settler colonial contexts, necessitate a critical examination of the underlying power dynamics and narratives that inform these discussions. As articulated through various research initiatives, the intersections of colonialism, capitalism, and social justice must be carefully navigated to avoid perpetuating the very injustices that climate action seeks to redress (Trimble, 2024). The analysis of changing narratives within the settler philanthropy sector reveals persistent colonial durability that camouflage the ongoing impacts of colonial violence, thereby complicating genuine commitments to reconciliation (Trimble, 2024). As scholars and practitioners engage in collaborative and participatory frameworks to address these issues, they must prioritize the lived experiences of marginalized communities and foster relational practices that promote a more equitable future. The path forward requires vigilance, reflexivity, and a steadfast commitment to dismantling oppressive structures, ensuring that no community remains left in the dust.

### 10.1 Summary of Key Points Discussed

The exploration of settler scholar positionality is a critical juncture in understanding the overarching dynamics of equity and collaborative commitment in educational contexts. It necessitates a close examination of how systemic barriers perpetuate inequitable outcomes, especially concerning Indigenous students' educational experiences. By employing frameworks like critical theory, as evidenced in various scholarly works, one can dissect the implications of settler colonialism on educational leadership and policy. For instance, the disparities faced by Indigenous students in Alberta, as reported, stem from historical and contemporary leadership practices that uphold deficit thinking and unconscious biases (Barron, 2024). This position urges a transformative approach, advocating for reflexivity and dialogic practices among educational leaders. Such a focus not only promotes critical consciousness among these leaders but also sets the groundwork for system-wide changes that should strive for tangible equity and inclusion across the educational spectrum. Further highlighting the necessity of collaborative frameworks, the discourse surrounding knowledge exchange reveals profound implications within the realm of educational reform. Grounded in principles of shared knowledge creation and the redistribution of power, engaging with Indigenous perspectives necessitates a structural rethinking of how educational bodies operate. The reframing of Indigenous peoples as political-legal entities, as highlighted in current dialogues, serves to counter traditional narratives that often marginalize their voices (Weir et al., 2024). This shift requires embracing Indigenous epistemologies in a meaningful way, thus facilitating a more equitable approach to knowledge generation and application in educational settings. In essence, the incorporation of these diverse perspectives not only enriches the academic fabric but also fosters an environment conducive to genuine collaboration, where all stakeholders can navigate the complexities of educational equity and inclusion. Lastly, the analysis of philanthropic narratives within settler contexts underscores the inherent dissonance in reconciling traditional philanthropic approaches with the pressing need for decolonial practices. The critical investigation of the reconciliation change narrative, particularly within Canadian settler philanthropy, elucidates how these frameworks can simultaneously perpetuate and resist colonial legacies (Trimble, 2024). By examining texts produced by philanthropic organizations, one can identify pervasive themes that either mask ongoing colonial violence or propose alternative trajectories aimed at reparations and relational advancements. This duality highlights the complexity of integrating equity into philanthropic practices, suggesting that merely engaging in reconciliatory rhetoric is insufficient. Instead, transformative practices grounded in mutual recognition and the prioritization of Indigenous knowledge must be at the forefront to achieve meaningful equity in educational and philanthropic interventions (Trimble, 2024). Consequently, the synthesis of these insights will serve as a robust foundation for future research and practice in fostering a decolonized educational landscape (Rudolph, et al, 2024).

### 10.2 Call to Action for Settler Scholars in Fostering Equity and Collaboration

In the context of settler scholars, the call to action for fostering equity and collaboration necessitates a profound re-evaluation of existing scholarly practices and positionality. Settler scholars must actively engage in decolonial methodologies (Omodan, 2025) that confront and dismantle the systemic inequities perpetuated by traditional academic frameworks. This involves the incorporation of Indigenous knowledge systems and community-driven research paradigms that not only acknowledge but also prioritize the voices and experiences of marginalized communities. As noted in contemporary scholarship, the silence surrounding pressing issues, such as the ongoing genocide in Palestine, exemplifies a troubling trend of complicity among scholars who fail to address colonial violence, thereby undermining their commitment to equity (Shoman et al., 2025; Davis, 2020). Embracing a collaborative ethos is essential; it requires intentional efforts to build partnerships that value mutual respect, shared leadership, and the radical decentering of dominant narratives within research agendas. To effectively promote equity, settler scholars must actively support the development of frameworks that are centered on community engagement and social justice. Teacher educators, for instance, are called to facilitate learning environments that bolster pre-service teachers' abilities to advocate for justice in their future practices. Essential practices include fostering self-awareness, bridging connections with community, cultivating equitable communication, and subverting existing structures of oppression (Weiler et al., 2025). These strategies create a foundation for sustained engagement in equity-oriented actions beyond

formal education contexts. Consequently, settler scholars must prioritize the development of pedagogical strategies that emphasize critical consciousness, enabling both scholars and practitioners to engage deeply with the implications of their positionality in educational and research settings. Elevating marginalized voices within these discourses not only cultivates a more inclusive environment but also strengthens the call for collaborative commitment to equity across various academic disciplines. The urgency of developing critical leadership frameworks becomes evident when considering the transformative potential of youth engagement, particularly in the Latinx community. Settler scholars are encouraged to initiate conversations that recognize Latinx youth as essential leaders and advocates for equity, thereby prompting the exploration of culturally responsive leadership frameworks (Guzman, 2024). These frameworks can act as strategic blueprints that empower youth to navigate and confront systemic inequalities, supporting their development as critical thinkers and community leaders. By integrating principles that honor diverse cultural experiences into scholarly dialogues, settler scholars can both enrich their research and contribute to social equity. This commitment to fostering a collaborative spirit extends beyond mere acknowledgment of diversity; it demands active participation in the creation of inclusive frameworks that resonate with the lived experiences and aspirations of all community members, heralding a shared commitment to liberatory futures for both marginalized and settler individuals alike (Mad Plume, 2024).

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# The United Nations Economic and Social Council (ECOSOC)'s Representation Gaps: Regional Equity in Global Political and Economic Governance

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## ABSTRACT

This research evaluates the effectiveness of the United Nations Economic and Social Council (ECOSOC)'s membership structure in ensuring equitable global representation using mixed methods combining quantitative surveys (n=90) with qualitative expert interviews (n=4). Findings reveal only 6.9% of respondents rated regional distribution as "Very Fair", with Least Developed Countries (LDCs) and Small Island Developing States (SIDS) perceived by 43.2% and 26.1%, respectively, facing greatest representation challenges. Resource disparities – political power dynamics (43.2%) and financial constraints (34.1%) – significantly impact representation quality beyond formal membership allocations. These findings have significant implications for multilateral governance frameworks, demonstrating that formal institutional equality does not guarantee substantive influence. The representation gaps identified threaten the legitimacy of global economic governance structures and may accelerate the shift toward alternative multilateral arrangements that better reflect contemporary power distributions. The analysis exposes a critical institutional paradox; while ECOSOC's regional framework provides basic geographical coverage, its distribution formula remained static for five decades despite fundamental shifts in global economic power. Geographical proximity does not translate into political cohesion, with varying regional coordination effectiveness impacting substantive influence. Three reforms are proposed: (1) Recalibrating regional seat distribution; (2) Implementing resource equalization mechanisms; and (3) Establishing enhanced regional coordination frameworks. The research explores Malaysia's 2025 ASEAN Chairmanship as a model to strengthen trilateral cooperation between the Association of the Southeast Asian Nations (ASEAN), Asian Development Bank (ADB) and the ECOSOC. Despite implementation barriers – political will (90%) and member state disagreements (70%) – these reforms would enhance ECOSOC's legitimacy and inclusivity. The findings contribute to institutional design literature for multilateral reform efforts, including the ongoing 2024 Summit of the Future emphasizing ECOSOC reform for achieving the UN Sustainable Development Goals.

**Keywords:** ECOSOC reform; Regional representation; Global governance; Institutional legitimacy; Asian political economy; Multilateral institutions

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## 1. INTRODUCTION

International organizations serve as fundamental mechanisms for coordinating the state-based international system, particularly within economic and social governance. The United Nations Economic and Social Council (ECOSOC) established as one of the six principal UN organs in 1945, functions as the primary forum for addressing international economic and social issues and developing policy recommendations for the UN system (United Nations, 1945). ECOSOC's composition includes 54 UN Member States elected by the UN General Assembly (UNGA) for overlapping three-year terms, with membership having expanded from the original 18 members through UN Charter amendments in 1965 and 1974 (Aeschlimann, 2021). The current seat distribution allocates 14 seats to the African Group (AG), 13 seats to the Western European and Other Group (WEOG), 11 seats to the Asia-Pacific Group (APG), 10 seats to the Latin American and Caribbean Group (GRULAC) and 6 seats to the Eastern European Group (EEG) (United Nations <https://ecosoc.un.org/en/about-us/members>) – a formula established decades ago that has remained largely unchanged despite significant shifts in global demographics and economic power.

Despite extensive literature on UN representation (Daws et al., 1999; Weiss, 2010), a critical gap remains in understanding how ECOSOC's formal representation structures translate into substantive influence across different regional groupings and development categories. Existing studies focus predominantly on United Nations Security Council (UNSC) reform or general UN representation principles, leaving ECOSOC's specific challenges underexplored. While having an active agenda coordinating 14 specialized agencies, 8 functional commissions and 5 regional commissions, ECOSOC faces mounting questions about whether its membership structure adequately represents contemporary global realities (Christensen, 2023; Oguno & Nzute, 2019). The principle of equitable geographical representation has been fundamental to UN legitimacy since 1945 (Daws et al., 1999; Gould & Rablen, 2013). However, ECOSOC's structure predominantly reflects the world of the 1960s-1970s rather than 21<sup>st</sup> century realities. While global economic power has shifted dramatically – with nations once labeled as developing, such as Brazil, China, India and others, now holding considerable power – ECOSOC's regional distribution formula has remained largely unchanged despite periodic functional reforms (Momani, 2013).

This institutional stagnation occurs amid calls for more democratic, inclusive and effective global governance. The development agenda has evolved from a primary focus on economic growth to embracing the comprehensive framework embodied in the UN Sustainable Development Goals (Geneva, United Nations, 2020) (Thérien & Pouliot, 2020), encompassing social, environmental, and economic dimensions. Simultaneously, technological advancements have enhanced global connectivity meanwhile emerging challenges – climate change, health crises, migration and digital transformation (Gostin & Friedman, 2020) – have redefined international cooperation requirements.

Against this backdrop, this research investigates how ECOSOC's membership framework adequately represents contemporary global realities across regional and socioeconomic dimensions. Specifically, the study examines stakeholder perceptions of representation fairness, analyzes resource and coordination disparities that mediate actual influence and identifies reform pathways for enhancing institutional legitimacy. Through mixed-methods analysis combining quantitative surveys (n=90) with qualitative expert interviews (n=4), this research provides empirical evidence on ECOSOC representation challenges and potential solution.

### 1.1 Research Problem and Significance

This research investigates whether ECOSOC's current membership framework adequately guarantees fair and equitable representation across global regions and socioeconomic backgrounds. The study examines potential reforms that could improve representation for underrepresented regions and economic groups while acknowledging practical implementation challenges within a complex multilateral setting.

The research addresses a critical gap in understanding how formal representation structures translate into substantive influence within international economic governance (Christensen, 2023; Oguno & Nzute, 2019). As emerging economies increasingly pursue alternative multilateral arrangements – including BRICS (Momani, 2013), the Group of 77 and traditional UN institutions such as the ECOSOC

faces growing pressure to demonstrate continued relevance through meaningful reform (Global Policy Forum, 2006; Weiss, 2010). From a political governance viewpoint, this research examines how formal representation structures interact with informal power dynamics across different regional groupings within ECOSOC. The study contributes to political governance literature by analyzing institutional design effects on representation outcomes, specifically investigating why some regional groups achieve greater coordination effectiveness than others. This institutional comparison reveals how geographical proximity does not automatically translate into political cohesion, challenging assumptions about regional representation in international organizations (Daws et al., 1999; Talmon, 2009).

This analysis holds particular significance for Asia-Pacific nations, which despite representing over half the global population, may face systematic underrepresentation within current structures (Panke, 2013; Thirlwell, 2009). The research explores how Malaysia's 2025 ASEAN Chairmanship could serve as a vehicle for improved regional coordination approaches (Jeshurun, 2008), potentially providing a template for wider institutional modernization. From a political governance perspective, this research contributes to understanding how institutional design affects representation outcomes across different regional groupings, offering insights into the relationship between formal rules and actual political influence in multilateral settings. Beyond institutional legitimacy, ECOSOC reforms have direct implications for national and regional policy coordination. Enhanced regional representation mechanisms could strengthen the alignment between ECOSOC recommendations and national development plans, particularly LDCs and SIDS, while improved coordination frameworks would enable regional organizations like ASEAN to more effectively channel member state priorities into global economic governance processes.

## 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

ECOSOC's representation challenges exist within broader debates about equity and effectiveness in global governance. The following review examines literature of ECOSOC representation challenges across the following dimensions:

### 2.1 Theoretical Foundations of International Representation

The concept of equitable representation in international organizations rests on theories of institutional legitimacy and democratic governance. Several scholars provide foundational analysis linking representation to institutional credibility (Daws et al., 2019; Gould & Rablen, 2013), arguing that widening gaps between aspirations and performance jeopardize UN's legitimacy (Daws et al., 1999, section vi, p.46). This perspective connects to broader debates about democratic deficits in global governance, where institutions created in different historical contexts struggle to maintain relevance amid changing power distributions (Rittberger et al., 2019; Weiss, 2013).

Academic analysis offers important insights into geographical representation in non-plenary bodies, noting "that regional groupings aim to ensure diverse viewpoints in smaller deliberative organs" (Schermers & Blokker, 2018, p.216-217). However, their analysis raises questions about diversity within regions – a concern particularly relevant to ECOSOC's large and heterogeneous regional groups. These theoretical frameworks establish that representation encompasses more than formal seat allocation – it requires examining actual influence, resource capacity and coordination effectiveness. While this literature provides conceptual tools for analyzing representation, it rarely addresses ECOSOC specifically. The next section examines studies that does focus on ECOSOC, revealing how theoretical representation ideals translate into this particular institutional context.

### 2.2 Critiques of ECOSOC's Representation Structure

Academic research has increasingly scrutinized ECOSOC's representation framework. Talmon (2009, p.45) identifies "significant inequalities between and within existing regional groups with the Western European and Other Group (WEOG) over-represented compared to developing states". This empirical foundation supports concerns about structural imbalances affecting representation quality. Weiss (2010, p.1-3; 2013 p.127) offers perhaps the most comprehensive critique of ECOSOC's effectiveness, arguing that membership expansion from 18 to 54 members between 1965-1973 brought

symbolic rather than substantive representation improvements. His identification of the “North-South quagmire” as preventing meaningful dialogue highlights how formal representation equality can mask substantive inequality. Weiss advocates for “issues-based and interest-based negotiations” moving beyond conventional geographical classifications – a perspective that informs this research’s exploration of development-based representation alternatives.

Recent analysis by Oguno and Nzute (2019, p.32-36) demonstrates how economic power significantly influences representation in UN bodies, creating what they term a “two-tier system” where formal membership equality conceals substantial influence disparities. Their finding that proposed representation reforms often reinforce rather than alleviate existing power dynamics underscores implementation challenges examined in this research. The literature establishes that ECOSOC has faced persistent critiques regarding both structural representation and operational effectiveness. However, these critiques largely focus on formal institutional arrangements – seat distributions, voting procedures, mandate scope – without systematically examining how economic power disparities and coordination challenges mediate representation outcomes. The political economy literature reviewed next provides analytical frameworks for understanding these deeper structural dynamics that shape representation beyond formal rules.

### 2.3 Political Economy of ECOSOC Membership

Understanding why states compete for ECOSOC membership despite perceived limitations requires examining tangible and intangible benefits that membership confers. Luck (2003, p.11-18) argues that even UN bodies with limited formal power serve as critical “nodes of influence” for shaping normative frameworks and building diplomatic coalitions. For developing nations, ECOSOC provides strategic advantages including access to development financing discussions, participation in norm-setting processes and enhanced diplomatic status.

However, these benefits are unevenly distributed, creating what Stone (2011, p.1) identifies as the “participation paradox” – formal membership equality that masks substantial inequalities in actual influence. Without adequate resources and institutional capacity, formal membership may not translate into meaningful influence, particularly for the constituencies most needing ECOSOC’s development coordination functions. Political economy analyses reveal how formal institutional equality can mask substantial disparities in actual influence, shaped by resource asymmetries and coordination capacity. These theoretical insights apply broadly to international organizations but remain underexplored in ECOSOC contexts. Moreover, this literature typically centers Western or Global South perspectives generally with limited attention to regional dynamics within the developing world. The Asian governance literature reviewed next addresses this gap which offered perspectives from a region representing 60% of global population yet systematically underrepresented in global economic institutions.

### 2.4 Asian Perspectives on Global Economic Governance

The Asian context adds crucial dimensions to ECOSOC representation questions. The rise of Asian economies has been accompanied by calls for greater representation in international economic institutions, reflecting broader shifts in global economic gravity (Momani, 2013; Thirlwell, 2009). More recent scholarship examines how COVID-19 economic disruptions accelerated Asian regional cooperation initiatives, strengthening regional value chains and institutional coordination mechanisms (Asian Development Bank, 2021, p.45-67; Kimura & Chen, 2022, p.214-218), and how the Belt and Road Initiatives has reshaped multilateral institutional preferences among Asian states (Jones & Hameiri, 2020, p.8-12).

Previous study demonstrates how countries like Brazil, India and South Africa, eventually becoming the founder of BRICS, have strategically leveraged multilateral participation to legitimize claims for greater representation in global economic governance (Nel & Stephen, 2010, p.72). The 2023-2024 BRICS expansion to include Argentina, Egypt, Ethiopia, Iran, Saudi Arabia and the UAE demonstrate accelerating dissatisfaction with traditional multilateral representation structures and the appeal of alternative institutional arrangements that offer more equitable decision-making processes (Cooper & Flemes, 2024, p.95-100; Stuenkel, 2023, p.145-168). For ASEAN specifically, collective action within international institutions has been a key strategy for amplifying individual member state influence. Malaysia’s approach to multilateral engagement, documented by Jeshurun (2008, p.110),

demonstrates how middle powers can leverage institutional positions to advance regional interests while building credentials for broader global governance participation.

The literature reviewed reveals three interconnected gaps that this research addresses: First, while scholars have identified representation inequalities in UN bodies generally (Gould & Rablen, 2013; Talmon, 2009), ECOSOC-specific analysis remains limited. Second, existing critiques focus primarily on formal seat distribution (Weiss, 2010) without examining how resource disparities and coordination effectiveness mediate actual influence. Third, despite growing attention to Asia's role in global governance (Momani, 2013; Thirlwell, 2009), systematic analysis of regional coordination challenges within ECOSOC's APG is lacking. This research bridges these gaps through mixed-methods analysis combining stakeholder perceptions with institutional dynamics across regional groupings.

### 3. METHODOLOGY

#### 3.1 Research Design

This research employs a convergent parallel mixed-methods design, collecting and analyzing quantitative and qualitative data concurrently before integration for interpretation. This approach provides comprehensive understanding of complex representation dynamics within ECOSOC's institutional framework while enabling validation of findings through cross-verification between methods. Participants were selected through purposive sampling to ensure representation across key dimensions. For the survey, inclusion criteria required: (a) UN-related experience of any kind; (b) Direct or substantive ECOSOC engagement; and (c) Familiarity with ECOSOC operations. The sample was stratified by professional background (diplomats, academics, NGO representatives, international organization staff) and regional representation (all five UN regional groups). Interview participants were selected based on direct ECOSOC decision-making experience (presidency, bureau membership or delegation leadership), diverse regional perspectives (developed and developing nations) and varied institutional positions.

#### 3.2 Data Collection

**Quantitative component:** A structured questionnaire was distributed to 221 diplomats, 233 government officials, 75 academics and 142 NGO representatives with ECOSOC experience. The survey period extended from late January through March 2025, yielding 90 completed responses (exceeding the target of 80). The questionnaire consisted of 25 questions across six sections namely respondent information, fairness of current structure, effectiveness of representation, integration and coordination, reform priorities and regional cooperation opportunities. The questionnaire is appended as Attachment 1.

**Qualitative component:** Semi-structured interviews were conducted with four key informants possessing direct ECOSOC experience: (1) A Malaysian Ambassador with experience during Malaysia's 2010 ECOSOC presidency; (2) A Nepalese diplomatic representative with UN experience in New York; (3) A UN Economic and Social Commission for Asia and the Pacific (UNESCAP) Secretary with 15 years of regional commission experience; and (4) A Japanese Foreign Ministry official (speaking in personal capacity). Interviews were conducted between February to March 2025 through various modes based on participants availability. The interview question is appended as Attachment 2.

Validity and reliability were ensured through: (a) Triangulation of quantitative survey patterns with qualitative interview insights to strengthen construct validity; (b) Expert validation through participant review of interview transcripts for accuracy; and (c) Internal consistency checks within survey responses, with contradictory patterns flagged for review. Of the 90 survey respondents, 64 (71.6%) were from the APG, including respondents from ASEAN Member States. While this provides some foundation for analyzing ASEAN perspectives, the sample size prevents drawing definitive conclusions about ASEAN consensus on specific reform proposals.



generalizability. The study relies primarily on perception-based assessments rather than quantitative outcome metrics of representation effectiveness. Future study could use systematic analysis of ECOSOC voting records across multiple sessions to empirically examine whether regional groups exhibit cohesion in actual decision-making, and whether representation on formal membership correlates with influence on substantive outcomes. This could employ network analysis to map coalition patterns and identify which member states serve as brokers across regional divides.

The research did not examine representation dynamics across ECOSOC’s subsidiary bodies. Each of these bodies likely exhibits distinct representation dynamics influenced by their mandate, composition, working methods and relation to ECOSOC’s historical evolution reforms (1965 and 1974 expansions). Future researches could utilize a comparative institutional analysis to investigate representation patterns across the broader ECOSOC system, which would illuminate the effects of regional dynamics across its diverse entities.

#### 4. RESULTS

The survey achieved broad stakeholder representation across regional, professional and experiential dimensions. The distribution reflects the purposive sampling strategy targeting stakeholders with substantive ECOSOC knowledge while ensuring representation across geographical and professional categories in table 1.

Table 1: Survey Respondent Demographics (n = 90\*)

<i>Category</i>	<i>Sub-Category</i>	<i>Total, n</i>	<i>Percentage, %</i>
Region	African States (AG)	10	10.20
	Asia-Pacific States (APG)	64	71.60
	Eastern European States (EEG)	4	7.40
	Latin American and Caribbean Group (GRULAC)	5	8.50
	Western European & Others (WEOG)	6	9.30
Professional Background	Diplomat/ Government Official	61	68.20
	Academic/ Researcher	9	10.20
	International Organization	4	4.20
	Civil Society / Non-Governmental Organization (NGO)	14	16.00
Un Experience	< 5 years	42	47.70
	5-10 years	26	28.40
	11-15 years	12	13.60
	15+ years	9	10.20
Direct ECOSOC Participation	Yes	34	38.60

\*Some respondents chose not to answer specific questions; percentages are calculated based on valid responses for each item.

It is important to note that stakeholder perceptions of representational fairness, while analytically valuable, do not necessarily reflect objective measures of institutional imbalance. Perceptions are shaped by normative expectations, professional experiences and institutional positions that may not align with demographic or economic indicators. For instance, the 6.9% “Very Fair” rating may reflect dissatisfaction with ECOSOC’s limited influence relative to other UN organs rather than purely seat distribution concerns. Nevertheless, perceptions matter significantly in international organizations, and legitimacy deficits perceived by member states and stakeholders can undermine institutional effectiveness regardless of whether formal structures meet objective equity criteria. This research treats perception data as indicators of legitimacy challenges that merit attention, while acknowledging that perception-based assessments require complementary analysis of structural and procedural dynamics.

#### 4.1 Structural Representation Gaps

The research reveals significant regional distribution imbalances within ECOSOC’s current membership structure. Only 6.9% of survey respondents rated the regional distribution as “Very Fair”, with 40.2% expressing neutrality and 25.2% considering it unfair (Survey data, 2025). This ambivalence reflects stakeholder recognition that while the current structure provides basic regional representation, it inadequately reflects contemporary global realities. The data is reflected in figure 2.

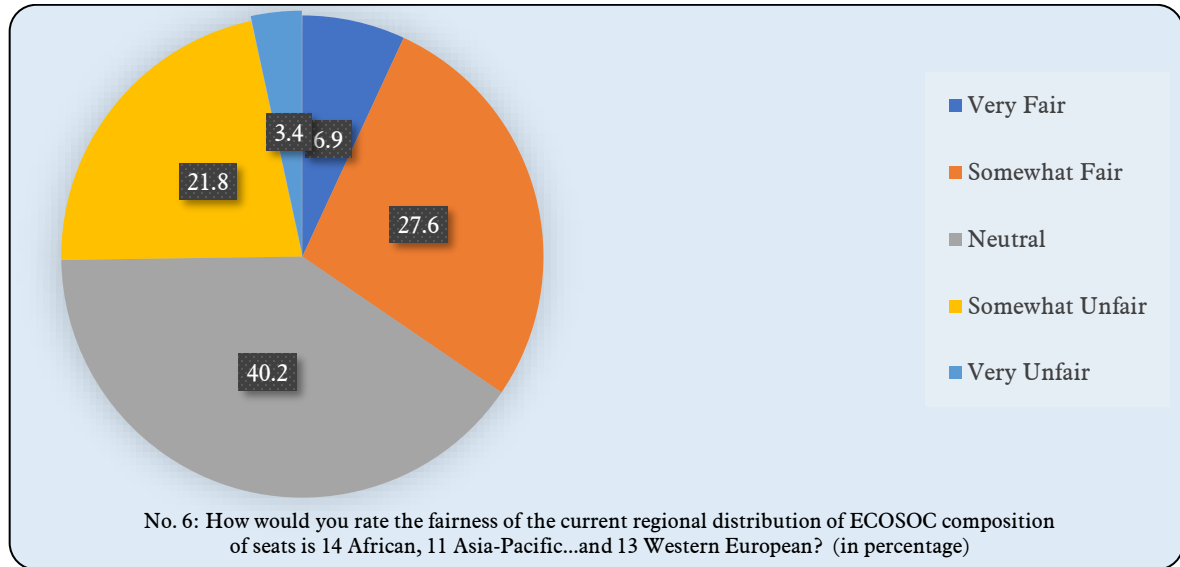


Figure 2: Fairness of Current Structure

Expert interviews confirmed these perceptions. The Malaysian Ambassador characterized voting patterns as following superpower alignments rather than regional interests (Interview with Malaysian Ambassador, 2025), while the UNESCAP Secretary stated there “should be more representation in the Asia-Pacific Group (APG) due to its vast membership and population compared to other regions” (Interview with UNESCAP Secretary, 2025). These observations align with the finding that the current distribution – 14 African Group (AG), 13 Western European and Other Group (WEOG), 11 Asia-Pacific Group (APG), 10 Latin American and Caribbean Group (GRULAC) and 6 Eastern European Group (EEG) seats – inadequately reflects contemporary demographics and economic significance.

#### 4.2 Socioeconomic Diversity Challenges

Beyond geographical distribution, the research identified critical gaps in representing socioeconomic diversity. Survey respondents identified LDCs (43.2%) and SIDS (26.1%) as facing greatest representation challenges. This finding was substantiated by expert observations that many developing countries lack capacity to maintain adequate permanent representation, severely limiting participation quality. The data is reflected as figure 3.

The survey indicated that current structures only moderately reflect contemporary global economic realities, with 44.3% rating this alignment at the midpoint of a five-point scale. The data is reflected as figure 4. A Japanese Foreign Ministry official (in its personal capacity) reinforced this assessment, noting “significant imbalances” particularly affecting emerging economies and small island states despite their increasing importance in global economic discussions (Interview with Japanese Foreign Ministry official (in its personal capacity), 2025).

#### 4.3 Resource Disparities and Participation Quality

A critical finding across both survey and interview data was how resource disparities impact representation quality beyond formal membership structures. Survey respondents identified political power dynamics (43.2%) and financial resources (34.1%) as primary barriers to effective representation.

The data is reflected as figure 5. The UNESCAP Secretary elaborated that advanced economies enjoy “added advantage due to availability of budget and means to participate in all meetings” while developing nations struggle with basic representation logistics (Interview with UNESCAP Secretary, 2025).

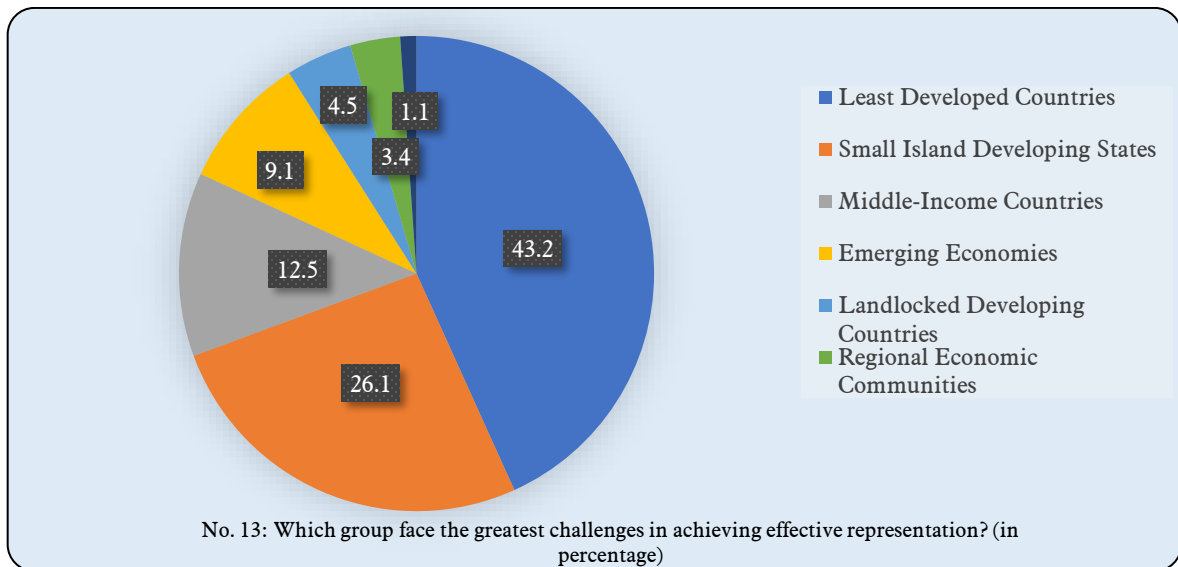


Figure 3: Effectiveness of Representation

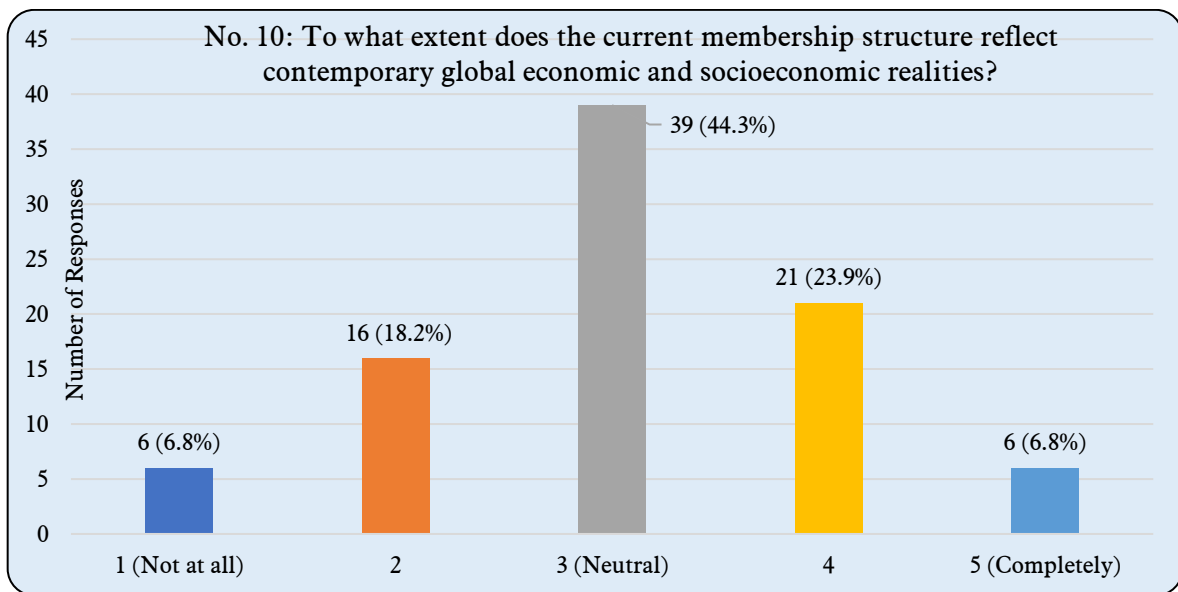


Figure 4: Fairness of Current Structure

These findings indicate that formal representation equality may be substantially undermined by participation inequalities in practice. The strong survey support for capacity building programs (90%), financial support (88%) and technical assistance (87%) reflect recognition of these practical participation barriers (Survey data, 2025). The data is reflected as figure 6.

#### 4.4 Regional Coordination Dynamics

The research revealed significant variations in how effectively different regional groups leverage formal representation. Multiple expert interviewees observed that GRULAC and WEOG typically demonstrate greater cohesion compared to the more fragmented APG. The UNESCAP Secretary noted that among APG, only ASEAN and the Pacific Island Forum (PIF) achieve regular coordination

(Interview with UNESCAP Secretary, 2025). This internal fragmentation potentially diminishes the APG’s effective influence despite having the third-largest seat allocation<sup>1</sup>. The former Nepalese UN representative characterized the group as having “very huge membership and divided on various issues” suggesting that formal seat allocations represent only one dimension of effective representation (Interview with former Nepalese UN official, 2025).

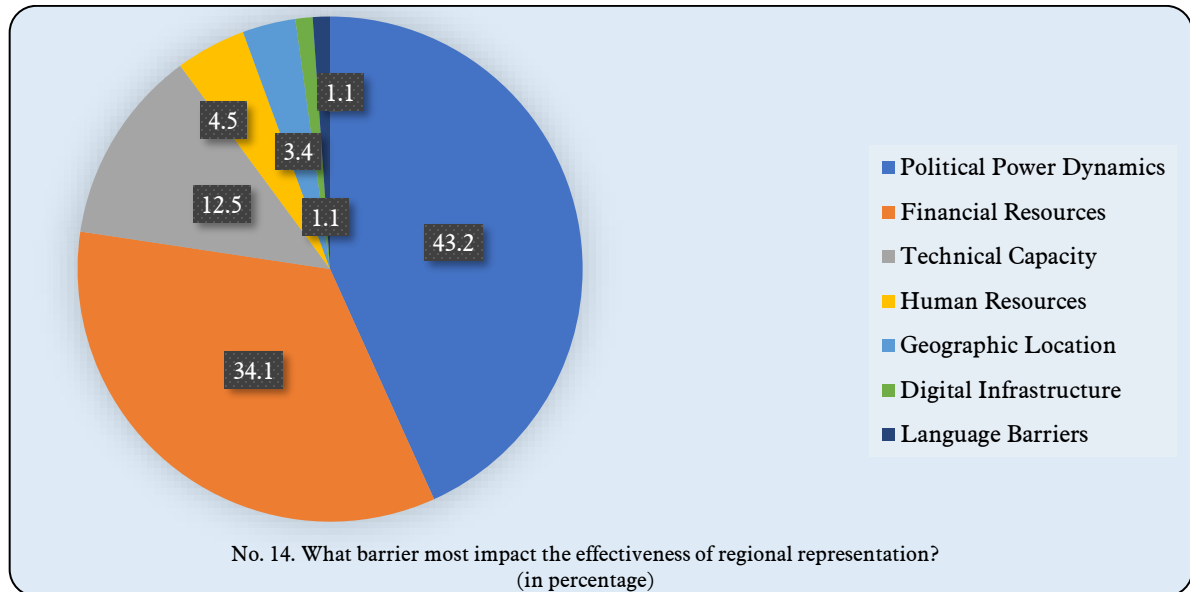


Figure 5: Effectiveness of Representation

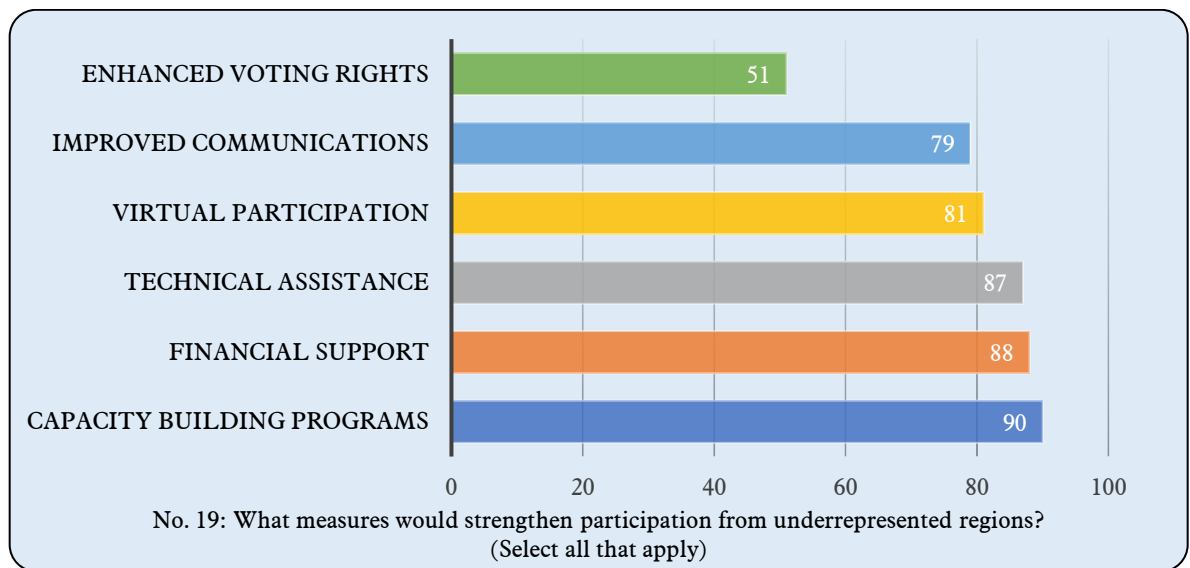


Figure 6: Reform and Improvement

#### 4.5 Reform Priorities and Implementation Barriers

Survey respondents identified clear reform priorities: Regional Seat Distribution (30.7%) and Decision-Making Processes (28.4%) as aspects most needing reform (Survey data, 2025). The data is reflected as figure 7. Expert interviewees offered specific suggestions, with the Malaysian Ambassador

<sup>1</sup> ECOSOC’s current seat distribution allocates 14 seats to the African Group (AG), 13 seats to the Western European and Other Group (WEOG), 11 seats to the Asia-Pacific Group (APG), 10 seats to the Latin American and Caribbean Group (GRULAC) and 6 seats to the Eastern European Group (EEG). The list of countries for each regional groups for the year 2025 is reflected via this link <https://ecosoc.un.org/en/about-us/members>.

proposing concrete adjustments: increasing APG representation by two seats while reducing WEOG and AG by one seat each (Interview with Malaysian Ambassador, 2025).

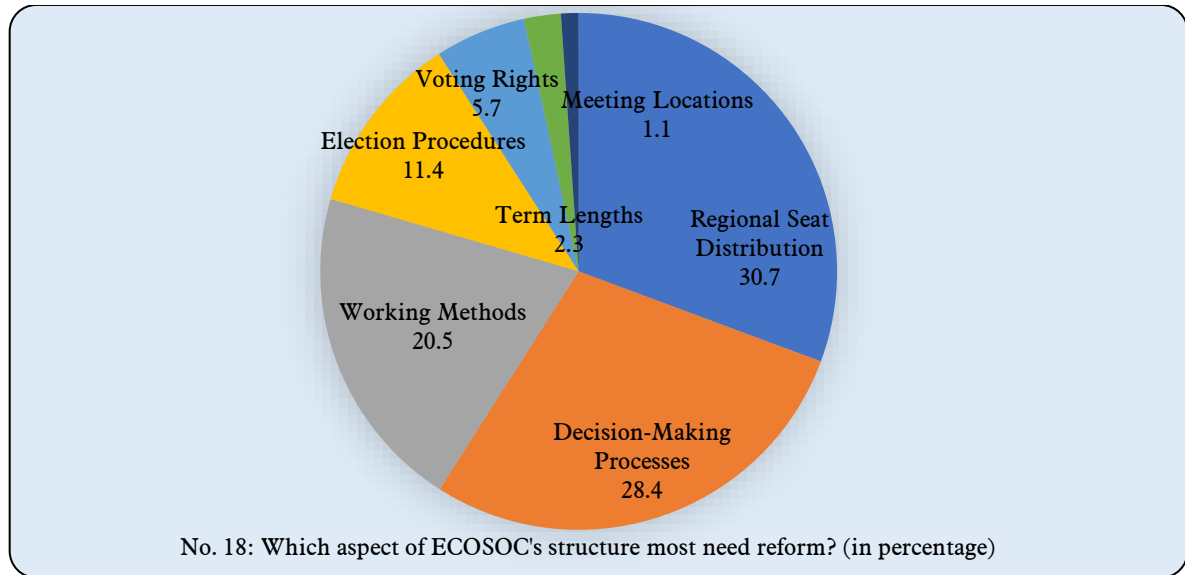


Figure 7: Reform and Improvement

However, the research also identified significant implementation barriers. Survey respondents overwhelmingly identified Political Will (90%) as the primary reform barrier, followed by Member State Disagreements (70%) and Resource Constraints (65%) (Survey data, 2025). The data is reflected as figure 8. Expert interviews confirmed these challenges, with multiple respondents acknowledging that while reforms are needed, implementation may take years due to institutional inertia and political resistance (Interviews with Malaysian Ambassador and Japanese Foreign Ministry official (in its personal capacity, 2025).

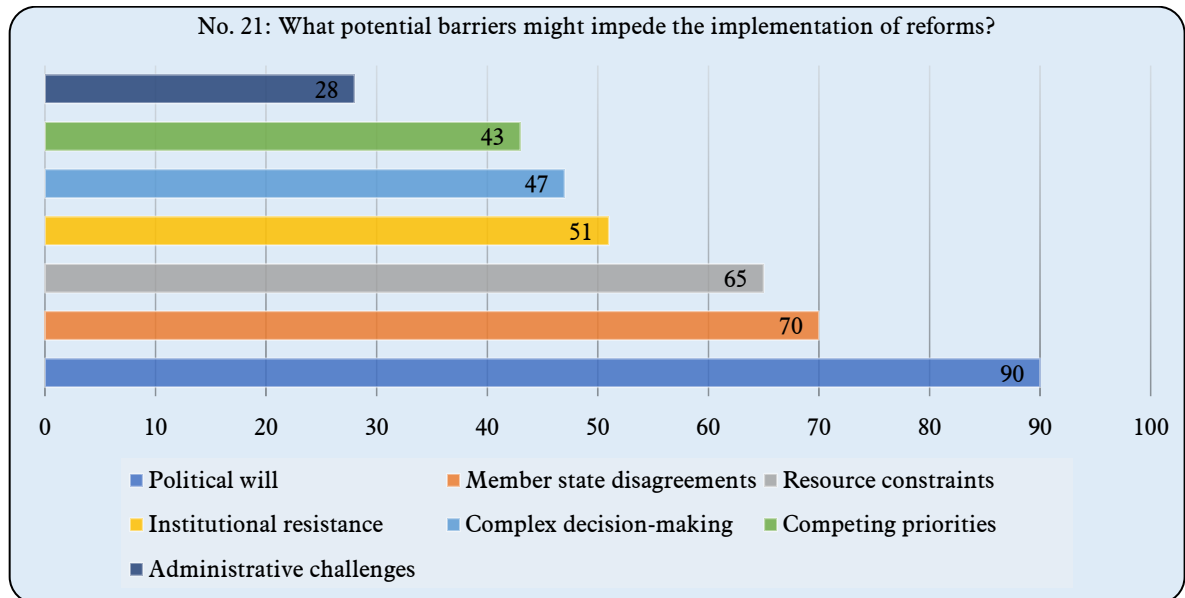


Figure 8: Section E: Reform and Improvement

#### 4.6 Malaysia's ASEAN Chairmanship Opportunities

Regarding Malaysia's 2025 ASEAN Chairmanship, survey respondents strongly favored strengthening trilateral cooperation between ASEAN, ADB and ECOSOC (40.9%) and engaging with

high-level ECOSOC platforms, particularly the High-Level Political Forum (30.7%) and Financing for Development Forum (27.3%) (Survey data, 2025). The data is reflected as figure 9.

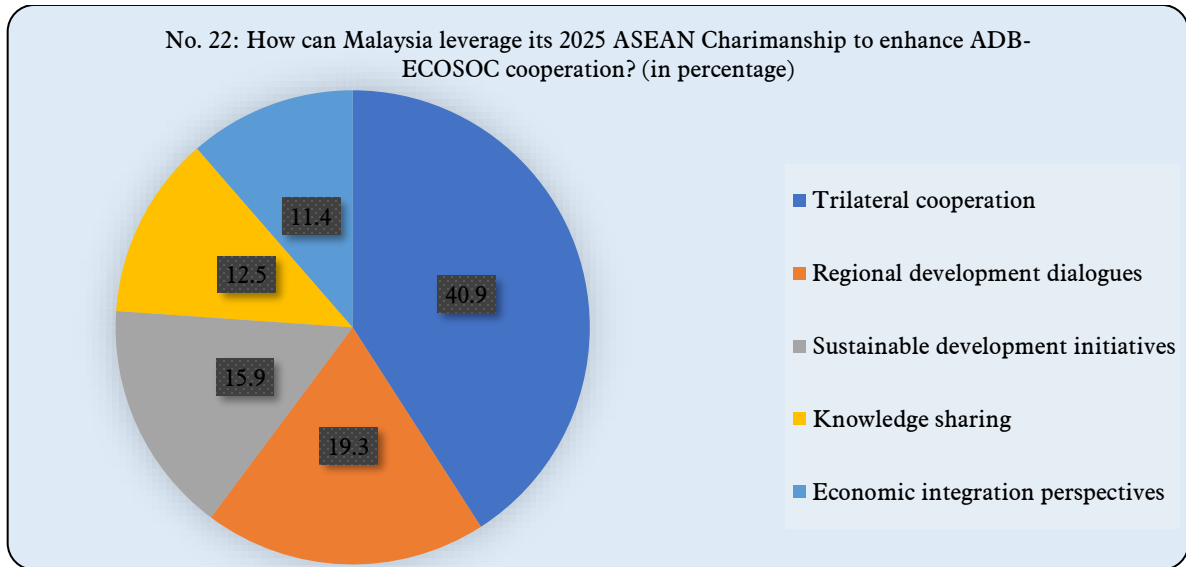


Figure 9: Section F: Regional Cooperation (Malaysia’s ASEAN Chairmanship 2025 and the ADB – ECOSOC Engagement)

Expert recommendations emphasized institutional relationship-building and leveraging ASEAN’s relative cohesion to advance regional priorities. The UNESCAP Secretary recommended focusing on areas where ASEAN and UN priorities overlap, particularly Second Committee issues (Economic and Financial Committee) where ASEAN consensus is stronger (Interviews with former Nepalese UN official and UNESCAP Secretary, 2025). The strong survey support for ASEAN-ADB-ECOSOC trilateral cooperation (40.9%) reflects broader stakeholder recognition of regional organizations’ potential role rather than specifically validated ASEAN policy preferences. The qualitative interviews with Malaysian and Japanese officials (the latter in its personal capacity) provide deeper institutional insights into ASEAN coordination possibilities, but these represent expert assessments rather than official ASEAN positions. Generalizations about Malaysia’s 2025 ASEAN Chairmanship opportunities should therefore be understood as research-based recommendations requiring validation through formal ASEAN consultation processes.

## 5. DISCUSSION AND ANALYSIS

### 5.1 Representation Legitimacy in Global Political and Economic Governance

Only 6.9% of respondents rated regional distribution as “Very Fair”, while 25.2% considered it “Unfair” or “Very Unfair”. This low satisfaction rate indicates a significant legitimacy deficit. Research on international organizations suggests that when fewer than 15% of stakeholders rate institutional arrangements as highly fair, legitimacy concerns emerge (Gould & Rablen, 2013). This threshold matters particularly for ECOSOC, whose core purpose is equitable representation. While not an immediate crisis, this legitimacy deficit undermines ECOSOC’s relevance amid growing alternative multilateral arrangements. This finding aligns with Oguno & Nzute’s (2019, p.32-36) identification of a “two-tier system” in UN representation, where formal equality masks substantial influence disparities. Similarly, Christensen (2023) argues that ECOSOC faces fundamental effectiveness questions. The low satisfaction rates (6.9%) echo Weiss’s (2010, p.1-3) critique that ECOSOC’s membership expansion brought symbolic rather than substantive improvements.

This legitimacy deficit must be understood within broader shifts in international political economy. The rise of alternative multilateral arrangements – including BRICS, the Asian Infrastructure Investment Bank and strengthened South-South cooperation mechanisms – reflects growing

dissatisfaction with traditional UN structures. These parallel institutions offer developing nations greater voice and more equitable decision-making processes, directly challenging ECOSOC's relevance. The concentration of representation challenges among LDCs (43.2%) and SIDS (26.1%) is particularly problematic from a political economy perspective (Survey data, 2025). These are precisely the constituencies that most need effective international coordination for development – yet they face the greatest barriers to meaningful participation.

The urgency of the 2024 Summit of the Future's Pact for the Future, which explicitly calls for revitalizing ECOSOC's coordination role. This high-level commitment provides a strategic momentum for addressing representation gaps identified in this research. Rather than pursuing standalone ECOSOC reforms that face resistance, integrating representation movements within the broader UN reform agenda endorsed by UN Member States may prove more politically feasible. This momentum aligns with the Global Policy Forum's (2006) earlier calls for ECOSOC reform and Luck's (2003, p.11-18) argument that even limited UN bodies serve as critical 'nodes of influence' for shaping normative frameworks.

## 5.2 Structural Inequities and Economic Power Dynamics

Survey respondents highlighted political power imbalances and resource constraints demonstrating that meaningful participation requires more than formal membership. This finding aligns with critical political economy analyses of international institutions. The "participation paradox" identified in the literature – where formal membership equality conceals substantial influence disparities – is clearly evident in ECOSOC dynamics. Advanced economies maintain consistent representation through well-resourced permanent missions while developing nations' struggle to cover participation costs. confirming (a) Stone's (2011, p.1) theoretical framework, which identifies how formal membership equality conceals substantial inequalities in actual influence; (b) Panke (2013) demonstration of similar dynamics in the UNGA, where unequal actors struggle within supposedly equalizing institutions; (c) Cooper and Shaw's (2009) analysis of small state vulnerabilities in multilateral settings; and (d) Keohane's (1969, p.291-310) seminal work on 'Lilliputians' Dilemmas' anticipated these exact challenges faced by smaller states in international politics.

Addressing resource disparities involve choosing between universal capacity support (promoting equity across all member states) and targeted assistance to the most disadvantaged (maximizing efficiency of limited resources). Universal approaches – such as standardized travel support or technical assistance program ensure broad buy-in but may dilute impact. Targeted mechanisms focused on LDCs and SIDS address the most acute needs but risk creating new hierarchies and resistance from middle-income countries also facing constraints. The suggestion by the Malaysian Ambassador that representation could be organized around development status rather than geographical grouping offers an intriguing alternative that might better reflect contemporary political economy realities. Such an approach would acknowledge that countries' economic development levels often provide better predictors of their international economic interests than geographical proximity. This alternative approach builds on Gould & Rablen (2013) theoretical work on equitable representation in UN bodies, which questions whether geographical criteria adequately reflect contemporary realities.

## 5.3 Regional Dynamics and Collective Action Challenges

GRULAC and WEOG groupings demonstrate greater cohesion than the APG despite APG's demographic significance (representing 60% of global population). For the APG specifically, the diversity spanning from least developed countries to advanced economies, combined with significant political and cultural differences, creates inherent collective action challenges. The Nepalese representative's example of Nepal's progressive social positions aligning more closely with WEOG than other APG illustrates how geographical groupings may inadequately capture value and policy similarities (Interview with former Nepalese UN official, 2025). The variation in regional cohesion supports Malone's (2000, p.3-23) findings about differential coordination effectiveness among regional groups in UNSC elections. Talmon (2009, p.45) previously identified similar inequalities between regional groups, particularly noting WEOG's over-representation compared to developing states. The Nepal example aligning more with WEOG than APG illustrates Talmon's (2009) argument for moving beyond geographical regionalism toward value-

based groupings. This finding also resonates with Nel & Stephen's (2010, p.1-22) analysis of how regional powers in the developing world face coordination challenges that limit their multilateral effectiveness.

Improving APG coordination effectiveness faces a tension between maintaining inclusive geographical representation and creating more cohesive sub-regional mechanisms. Formalizing sub-regional caucuses – such as ASEAN, South Asian Association for Regional Cooperation (SAARC)<sup>2</sup> or Central Asia – within APG structures could enhance coordination while maintaining broader regional identity. However, these risks creating new hierarchies where economically stronger sub-regions dominate weaker ones, or where states excluded from cohesive sub-groupings become further marginalized.

#### 5.4 ASEAN's Potential Role in Institutional Reform

Survey respondents strongly supported (40.9%) ASEAN-ADB-ECOSOC trilateral cooperation as a mechanism for enhanced regional coordination. This approach aligns with emerging trends toward “networked multilateralism” that complement rather than replace traditional UN structures (Thérien & Pouliot's, 2020, p.612-636). The potential for ASEAN-ADB-ECOSOC cooperation reflects broader trends identified by Barnett (1995) regarding partnerships between the UN and regional organizations in governance functions while Jeshurun's (2008, p.110) analysis of Malaysia's diplomatic approach demonstrates how middle powers can leverage institutional positions to advance regional interests, supporting the strategic opportunity identified in this research.

While ASEAN demonstrates relative cohesion compared to the broader APG, this unity varies significantly across issue areas. ASEAN achieves stronger consensus on: (a) Economic integration and trade facilitation; (b) ASEAN-centric institutional frameworks (ASEAN Plus Three (APT))<sup>3</sup>, East Asia Summit<sup>4</sup> (EAS)); (c) Sustainable development financing aligned with national development priorities; and (4) Procedural matters in multilateral forums. However, ASEAN cohesion weakens considerably regarding: (1) Security and strategic issues where member states maintain divergent great power relationships; (2) Human rights and governance norms where the ‘ASEAN Way’ of non-interference limits unified positions; (3) Climate change mitigation commitments where development priorities differ substantially between countries in ASEAN; and (4) South China Sea territorial disputes. The UNESCAP Secretary's observation that ASEAN achieves regular coordination specifically refers to economic and development issues – precisely the areas where ECOSOC engagement would occur. Malaysia's 2025 Chairmanship should therefore focus ECOSOC trilateral cooperation on these consensus-strong areas (particularly Second Committee economic issues) rather than assuming ASEAN can leverage broader cohesion.

The research also reveals realistic constraints on ASEAN's capacity to drive broader systemic change. The mixed expert assessments of ASEAN's potential influence reflect both the organization's achievements in regional coordination and its limitations in global agenda-setting. As Jordaan's (2003, p.165-181) distinction between emerging and traditional middle powers suggests, ASEAN's influence may be constrained by broader power dynamics regardless of coordination improvements. Moreover, Cox (1981, p.126-155) identifies tensions between state-based international systems and evolving global power structures suggests ECOSOC's problems are symptomatic of broader global governance challenges that regional solutions alone cannot resolve. While ASEAN-ADB-ECOSOC cooperation offers a promising pilot, its ultimate success depends on whether improvements in one regional group's coordination create demonstration effects that encourage broader systemic reforms – or whether they simply create another tier in an increasingly fragmented multilateral landscape.

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<sup>2</sup> The South Asian Association for Regional Cooperation (SAARC) is an economic and political regional organization of countries in South Asia that aims to accelerate cooperation, combat disasters and promote economic development in South Asia. While SAARC is still technically active, it has been largely dormant due to geopolitical conflict between India and Pakistan and the situation in Afghanistan. SAARC has 8 members namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

<sup>3</sup> ASEAN Plus Three (APT) consist of ten ASEAN Member States, China, Japan and the Republic of Korea (ROK). The APT has evolved as the main vehicle to promote cooperation between ASEAN and the East Asian Community. APT has continued to deepened cooperation in a wide range of areas including political-security, trade and investment, finance, energy, tourism, agriculture and forestry, environment, education, health, culture and arts, among others.

<sup>4</sup> East Asia Summit (EAS) is a regional forum held annually by leaders of ASEAN, East Asian and Indo-Pacific countries discussing political, security and economic challenges facing the region. The EAS has 19 members namely the 10 ASEAN countries, Australia, China, India, Japan, New Zealand, ROK, Russian Federation and the USA. The EAS plays vital role in advancing regional cooperation in many areas.

## 6. REFORM PROPOSALS AND POLICY IMPLICATIONS

### 6.1 Structural Reform: Development-Based Representation

Based on the research findings, this paper proposes a comprehensive three-pillar reform approach that addresses structural, procedural and coordination deficiencies in ECOSOC's representation framework. The structural reform component involves establishing a hybrid representation model combining geographical and development-based criteria, beginning with immediate seat recalibration – increasing APG representation by two seats while WEOG and AG representation by one seat each to better reflect contemporary demographics and economic significance. This would be complemented by longer-term development-based representation criteria ensuring adequate representation for LDCs, SIDS, middle-income countries and emerging economies across all regional groups, responding to widespread recognition that LDCs and SIDS encounter the most severe participation barriers. Implementation would proceed through a time-bound Reform Working Group with balanced regional representation and a 24-month mandate to develop concrete recommendations aligned with ongoing UN reform processes.

To expand the membership of the ECOSOC via the UN Charter, Article 61<sup>5</sup> must be formally amended through the process outlined in Article 108<sup>6</sup>. This rigorous procedure requires widespread agreement from both the UNGA and the broader UN membership, specifically including all five permanent members of the UNSC (China, France, Russian Federation, UK and USA). This extraordinarily high threshold has been achieved only twice (1965 and 1974 amendments) reflecting intense political difficulty. Nevertheless, the 2024 Summit of the Future creates political momentum by explicitly calling for ECOSOC revitalization, potentially a strategic window for reform discussions. The specific seat recalibration proposal derives from multiple factors rather than a single metric that would include (a) Population Representation – APG represents 60% of global population but holds only 20.4% of ECOSOC seats (11/54), suggesting substantial underrepresentation. Increasing to 13 seats (24%) partially addresses this gap while remaining politically feasible; Economic significance – APG accounts for approximately 40% of global domestic product (GDP), yet this economic weight is not reflected in current allocations where WEOG (24% of seats) represents roughly 30% of global GDP; and (c) The APG has grown significantly since the 1974 seat allocation, now comprising 53 UN Member States compared to 28 in WEOG, yet seat allocation has not adjusted proportionally.

### 6.2 Procedural Reform: Resource Equalization

The procedural reform pillar addresses resource disparities identified as fundamental barriers to effective participation through systematic capacity-building programs (supported by 90% of respondents), dedicated funding mechanisms for participation costs including travel and personnel expenses and technical assistance systems for document preparation and position development that advanced economies typically handle through well-resourced permanent missions. These measures directly respond to the finding that financial resources represent 34.1% of representation barriers while political power dynamics account for 43.2%.

### 6.3 Coordination Reform: Enhanced Regional Frameworks

The coordination reform component establishes enhanced regional frameworks through formalized regular regional consultations (preferred by 40.9% of respondents) with dedicated secretariat support, digital coordination platforms that reduce costs while improving communication quality, and pre-session coordination funding for regional groups to conduct thorough consultation processes. This addresses the observation that only ASEAN and the PIF maintain consistent coordination within the fragmented APG, potentially diminishing the APG's effective influence despite having the third-largest seat allocation.

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<sup>5</sup>Article 61 explicitly defines the composition of ECOSOC and the process for electing its members.

<sup>6</sup>Article 108 lays out the formal, two-stage procedure for amending the UN Charter which mandates: (a) Two-thirds majority vote in the UNGA; and (b) Ratification by two-thirds of UN Member States.

#### 6.4 Pilot Project: ASEAN-ADB-ECOSOC Trilateral Cooperation

Malaysia's 2025 ASEAN Chairmanship provides an opportunity to pilot these coordination mechanisms through ASEAN-ADB-ECOSOC trilateral cooperation, establishing formal dialogue mechanisms with regular summit meetings and joint project development, focusing on policy areas where organizational mandates overlap – particularly sustainable development financing and climate change adaptation where ASEAN consensus is strongest – and creating knowledge-sharing initiatives that build institutional relationships extending beyond Malaysia's chairmanship period. This pilot approach allows for demonstrating reform benefits while building political momentum for broader institutional change, addressing the political will constraints identified by 90% of respondents as the primary implementation barrier. The proposed trilateral cooperation between ASEAN, ADB and ECOSOC appears particularly timely given ongoing trade policy volatility and shifting economic relationships in the Asia-Pacific region. Recent protectionist trade measures affecting various economies, including Asian trading partners, create an urgent context for strengthened regional coordination mechanisms that can help member states navigate economic uncertainty while maintaining multilateral engagement.

### 7. IMPLEMENTATION CHALLENGES AND RECOMMENDATIONS

The research identifies significant barriers to implementing ECOSOC representation reforms, with political will (90%) emerging as the primary obstacle, followed by member state disagreements (70%) and resource constraints (65%). These challenges reflect fundamental political economy dynamics in international institutional change, where existing power holders benefit from current arrangements and resist changes that might dilute their influence.

#### 7.1 Political Economy of Reform

To successfully implementing the proposed reforms requires a strategic approach that frames change as enhancing rather than threatening existing members' interests, emphasizing ECOSOC's declining relevance without reform to create incentives for change among stakeholders concerned about institutional marginalization. Coalition building becomes crucial, requiring partnerships between reform beneficiaries and current power holders, with middle powers and emerging economies playing bridging roles given their stakes in both institutional stability and representation equity. Representation reforms are not about diminishing any region's influence but about preventing ECOSOC's collective irrelevance. When the APG – representing 60% of global population and 40% of GDP – perceives systematic underrepresentation, states pursue alternative venues. WEOG and other regional groupings benefit from a legitimate and effective ECOSOC that maintains its coordinating role rather than a marginalized ECOSOC that loses policy influence to institutions where they have less voice.

#### 7.2 Resource and Capacity Constraints

Resource and capacity constraints present additional implementation challenges. Reform initiatives require long-term funding commitments that cannot depend solely on voluntary contributions from beneficiary states. Integration with existing UN reform funding mechanisms and development assistance programs could provide more stable resource bases. Enhanced representation also demands institutional capacity development within both member states and ECOSOC secretariat structures, including personnel training, systems development and procedural adaptation to accommodate more diverse participation.

#### 7.3 Timeline and Sequencing

Digital technologies offer opportunities to reduce participation costs while improving coordination quality, but digital divides among member states require careful attention to ensure technology solutions do not exacerbate existing inequities. Realistic implementation requires carefully sequenced initiatives: short-term pilot coordination projects during Malaysia's ASEAN Chairmanship and immediate seat reallocation adjustments; medium-term development and testing of resource

equalization mechanisms; and long-term comprehensive structural reforms with permanent funding mechanisms for participation support. This phased approach allows for demonstration of benefits before requiring formal institutional changes, building momentum while addressing the political economy constraints that make wholesale reform difficult.

## 8. CONCLUSION

This research demonstrates that ECOSOC's current membership structure faces a fundamental legitimacy crisis in ensuring fair and equitable representation of global regions and socioeconomic diversity. With only 6.9% of stakeholders rating the current regional distribution as "Very Fair" and LDCs and SIDS- the constituencies most needing effective international coordination – facing the greatest representation challenges (43.2% and 26.1% respectively), ECOSOC confronts a paradox where those most affected by global economic decisions have the least influence over institutions designed to address their concerns.

The findings reveal that representation challenges extend far beyond seat allocations to fundamental questions about how economic capabilities translate into institutional influence. Resource disparities, particularly political power dynamics (43.2%) and financial constraints (34.1%) enable advanced economies to leverage their economic capabilities into disproportionate institutional influence, while formal representation equality masks substantial participation inequalities. This legitimacy deficit is particularly problematic given the rise of alternative multilateral arrangements – including BRICS, the Asian Infrastructure Investment Bank and strengthened regional organizations – that offer developing nations greater voice and more equitable decision-making processes. For Asian political economy specifically, the research reveals how the region's diversity spanning from least developed countries to advanced economies, combined with significant political and cultural differences, creates collective action challenges that more cohesive regional groups do not face. Despite representing over half the global population and increasingly significant economic weight, Asian states may be systematically disadvantaged by coordination challenges, with only ASEAN and the PIF maintaining consistent positions within the fragmented APG.

The proposed three-pillar reform approach – structural recalibration through development-based representation criteria, procedural support through resource equalization mechanisms and coordination enhancement through formalized regional consultations – offers concrete policy directions that address both immediate inequities and longer-term institutional adaptation needs. Malaysia's 2025 ASEAN Chairmanship presents a strategic opportunity to pilot these coordination mechanisms through ASEAN-ADB-ECOSOC trilateral cooperation, potentially demonstrating how reformed multilateral mechanisms can remain relevant alongside emerging alternative arrangements. However, implementation faces significant political economy constraints, with political will (90%) and member state disagreements (70%) representing primary barriers. Success requires framing reforms as enhancing rather than threatening existing members' interests while building coalitions between reform beneficiaries and current power holders. The urgency of these reforms extends beyond institutional improvement to the credibility of multilateral cooperation itself – without meaningful adaptation to represent contemporary realities, traditional institutions risk further marginalization as states pursue development objectives through alternative mechanisms.

The research contributes systematic empirical evidence of representation gaps in global economic governance while providing policy frameworks for institutional adaptation. In an era of rising nationalism and fragmented global governance, demonstrating that international institutions can evolve to reflect changing power distributions becomes crucial for maintaining the cooperative frameworks necessary to address shared global challenges. ECOSOC's ability to implement meaningful representation reforms may serve as a test case for whether traditional multilateral institutions can adapt to 21<sup>st</sup>-century realities or will continue losing relevance to more nimble alternatives that better reflect contemporary economic and political dynamics.

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## ATTACHMENT 1

### Cover Note

#### **Research Questionnaire on the United Nations Economic And Social Council (ECOSOC)'s Membership Structure and Equitable Regional Representation**

Dear Sir/Madame/Participant,

It is my distinct privilege to introduce myself. I am Nurul Syaza Azlisha, an Asian Development Bank (ADB) scholar from Malaysia and a Master of Public Policy (International Program) (MPP/IP) candidate at The University of Tokyo, Japan.

Currently, I am conducting research for my master's thesis examining "How Effectively Does the Current Membership Structure of the United Nations Economic and Social Council (ECOSOC) Ensure Fair and Equitable Representation of Global Regions and Socioeconomic Diversity?".

This questionnaire aims to gather valuable insights from stakeholders who may have experience with and/or knowledge of the work of the ECOSOC. It consists of 25 questions divided into six sections namely (A) Respondent Information; (B) Fairness of Current Structure; (C) Effectiveness of Representation; (D) Integration and Coordination; (E) Reform and Improvement; and (F) Regional Cooperation. The final section particularly focuses on Malaysia's current ASEAN Chairmanship in 2025 and potential ECOSOC-ADB engagement. It should take approximately 15-20 minutes to complete.


This survey is completely anonymous and conducted for academic research purposes only. While aggregated results may be shared with third parties, no personally identifiable information will be disclosed. All responses will be analyzed at a group level only to maintain confidentiality.

If you could spare a moment, I would greatly appreciate your participation in this questionnaire. The link is <https://forms.gle/E97S2HnbAXWi9Ax38>. Your responses will contribute significantly to understanding how the ECOSOC's membership structure impacts global representation and developing recommendations for enhancement. Your participation in this research is greatly appreciated. If you are not familiar with the work of the ECOSOC, no worries, you can browse about it via <https://ecosoc.un.org/en>. Feel free to share with others who might be interested!

For any queries, please contact me at [nurulsyaza88@g.ecc.u-tokyo.ac.jp](mailto:nurulsyaza88@g.ecc.u-tokyo.ac.jp) and/or mobile +818035595058.

Thank you for your time and valuable contribution.

Sincerely,



Master of Public Policy (International Program) (MPP/IP) Candidate  
Graduate School of Public Policy, The University of Tokyo  
Asian Development Bank (ADB) Scholar

## Questionnaire

“How Effectively Does the Current Membership Structure of the United Nations Economic and Social Council (ECOSOC) Ensure Fair and Equitable Representation of Global Regions and Socioeconomic Diversity?”

### Section A: Respondent Information

1. Which region are you from?
  - African States
  - Asia-Pacific States
  - Eastern European States
  - Latin American and Caribbean States
  - Western European and Other States
  
2. What is your professional background?
  - Diplomat/Government Official
  - Academic/Researcher
  - International Organization Professional
  - Private Sector Professional
  - Civil Society Organization Representative
  - Other (please specify): \_\_\_\_\_
  
3. How many years of experience do you have working with or studying UN-related matters?
  - Less than 5 years
  - 5-10 years
  - 11-15 years
  - More than 15 years
  
4. Have you directly participated in ECOSOC meetings or processes?
  - Yes
  - No
  
5. What is your primary area of expertise in relation to ECOSOC's work? (Select one)
  - Economic Development
  - Social Development
  - Environmental Sustainability
  - Humanitarian Affairs
  - Public Administration
  - International Relations
  - Regional Cooperation
  - Elections/Candidatures
  - Other (please specify): \_\_\_\_\_

### Section B: Fairness of Current Structure

6. How would you rate the fairness of the current regional distribution of ECOSOC seats? (The composition of seats is 14 African, 11 Asia-Pacific, 6 Eastern European, 10 Latin American/Caribbean and 13 Western European)
- Very Fair
  - Somewhat Fair
  - Neutral
  - Somewhat Unfair
  - Very Unfair
7. Does the three-year membership term adequately serve representation needs?
- Yes, it's optimal
  - No, it's too short
  - No, it's too long
  - Unsure
  - Other (please specify): \_\_\_\_\_
8. How effectively does the current election system promote fair representation?
- Very Effective
  - Somewhat Effective
  - Neutral
  - Somewhat Ineffective
  - Very Ineffective
9. What impact does the practice of having permanent United Nations Security Council (UNSC) members consistently in ECOSOC's decision-making balance?
- Positive
  - Somewhat Positive
  - No Impact
  - Somewhat Negative
  - Very Negative
10. To what extent does the current membership structure reflect contemporary global economic and socioeconomic realities?  
Not at all 1 2 3 4 5 Completely  
Please explain your rating: \_\_\_\_\_

### Section C: Effectiveness of Representation

11. How effectively does the current membership structure represent different levels of economic development?
- Very Effective
  - Somewhat Effective
  - Neutral
  - Somewhat Ineffective
  - Very Ineffective
12. How effectively does the current Bureau system represent regional interests?
- Very Effective
  - Somewhat Effective
  - Neutral
  - Somewhat Ineffective
  - Very Ineffective
13. Which group face the greatest challenges in achieving effective representation?

- Least Developed Countries
- Small Island Developing States
- Landlocked Developing Countries
- Middle-Income Countries
- Emerging Economies
- Regional Economic Communities
- Other (please specify): \_\_\_\_\_

14. What barrier most impact the effectiveness of regional representation?

- Financial Resources
- Technical Capacity
- Political Power Dynamics
- Geographic Location
- Language Barriers
- Digital Infrastructure
- Human Resources
- Other (please specify): \_\_\_\_\_

15. How would you rate the effectiveness of ECOSOC's current working methods in promoting inclusive participation?

5 ▼ ★ ▼

1 2 3 4 5

☆ ☆ ☆ ☆ ☆

#### Section D: Integration and Coordination

16. How effectively do regional commissions (Economic Commission for Africa (ECA), Economic and Social Commission for Asia and the Pacific (ESCAP), Economic Commission for Europe (ECE), Economic Commission for Latin America and the Caribbean (ECLAC) and Economic and Social Commission for Western Asia (ESCWA)) support member state participation?

- Very Effective
- Somewhat Effective
- Neutral
- Somewhat Ineffective
- Very Ineffective

17. What mechanism would most improve regional coordination? (Select top 3)

- Regular Regional Consultations
- Enhanced Information Sharing
- Stronger Regional Secretariat Support
- Better Resource Pooling
- Improved Digital Collaboration Tools
- Other (please specify): \_\_\_\_\_

#### Section E: Reform and Improvement

18. Which aspect of ECOSOC's structure most need reform?

- Regional Seat Distribution
- Term Lengths
- Election Procedures

- Decision-Making Processes
  - Voting Rights
  - Meeting Locations
  - Working Methods
  - Other (please specify): \_\_\_\_\_
19. What measures would strengthen participation from underrepresented regions? (Select all that apply)
- Financial Support for attendance at meetings
  - Technical Assistance for preparation and participation
  - Capacity Building Programs
  - Improved Communications Channel
  - Virtual Participation Options
  - Enhanced Voting Rights on Specific Issues
20. What impact does the location of meetings of the ECOSOC meetings have on representation?
- Significant positive impact
  - Moderate positive impact
  - No impact
  - Moderate negative impact
  - Significant negative impact
  - Depends on the type of meeting
  - Other (please specify): \_\_\_\_\_
21. What potential barriers might impede the implementation of reforms? (Select top 3)
- Political will
  - Resource constraints
  - Institutional resistance
  - Competing priority areas
  - Complex decision-making processes
  - Member state disagreements
  - Administrative challenges

**Section F: Regional Cooperation (Malaysia's ASEAN Chairmanship 2025 and the Asian Development Bank (ADB) - ECOSOC Engagement)**

22. How can Malaysia leverage its 2025 ASEAN Chairmanship to enhance ADB-ECOSOC cooperation? (Select all that apply)
- Facilitate regional development dialogues
  - Strengthen ASEAN-ADB-ECOSOC trilateral cooperation
  - Lead regional sustainable development initiatives
  - Promote ASEAN economic integration perspectives
  - Foster knowledge sharing between ADB and ECOSOC
  - Other (please specify): \_\_\_\_\_
23. Which ECOSOC platforms should Malaysia prioritize for ASEAN-ADB engagement during its chairmanship?
- High-level Political Forum on Sustainable Development
  - Financing for Development Forum
  - Development Cooperation Forum
  - Partnership Forum
  - ESCAP Regional Forums
  - Coordination Segment
  - Operational Activities Segment
  - Other (please specify): \_\_\_\_\_

24. How could Malaysia's ASEAN Chairmanship facilitate stronger ADB participation in ECOSOC's regional development work? (Select all that apply)
- Coordinate ASEAN-ADB development initiatives
  - Lead regional SDG implementation efforts
  - Promote Southeast Asian financing solutions
  - Enhance regional data collection and analysis
  - Strengthen ASEAN-ESCAP-ADB collaboration
  - Support capacity building programs
  - Champion regional infrastructure development
25. What long term outcomes should Malaysia prioritize to ensure sustainable ASEAN-ECOSOC-ADB collaboration beyond its 2025 Chairmanship? (Select all that apply)
- Sustainable regional development fund
  - Long-term capacity building programs
  - Regional innovation and research centers
  - Formalized multi-stakeholder partnerships
  - Regular regional development reviews
  - Other (please specify): \_\_\_\_\_

## ATTACHMENT 2

### Cover Note

#### **Interview Questions on the United Nations Economic and Social Council (ECOSOC)'s Membership Structure and Equitable Regional Representation**

Dear Sir/Madame/Participant,

It is my distinct privilege to introduce myself. I am Nurul Syaza Azlisha, an Asian Development Bank (ADB) scholar from Malaysia and a Master of Public Policy (International Program) (MPP/IP) candidate at The University of Tokyo, Japan.

Currently, I am conducting research for my master's thesis examining "How Effectively Does the Current Membership Structure of the United Nations Economic and Social Council (ECOSOC) Ensure Fair and Equitable Representation of Global Regions and Socioeconomic Diversity?".

This interview aims to gather valuable insights from stakeholder(s) who may have experience with and/or knowledge of the work of the ECOSOC. It consists of 5 questions and takes approximately 45-60 minutes to complete.

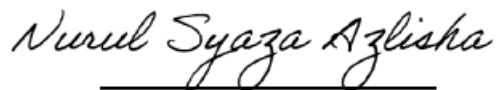
This interview is completely anonymous and conducted for academic research purposes only. While aggregated results may be shared with third parties, no personally identifiable information will be disclosed. All responses will be analyzed at a group level only to maintain confidentiality.

Your responses will contribute significantly to understanding how the ECOSOC's membership structure impacts global representation and developing recommendations for enhancement. Your participation in this research is greatly appreciated.

For any queries, please contact me at [nurulsyaza88@g.ecc.u-tokyo.ac.jp](mailto:nurulsyaza88@g.ecc.u-tokyo.ac.jp) and/or mobile +818035595058.

Thank you for your time and valuable contribution.

Sincerely,



Master of Public Policy (International Program) (MPP/IP) Candidate  
Graduate School of Public Policy  
The University of Tokyo  
Asian Development Bank (ADB) Scholar

## Thesis Topic

“How Effectively Does the Current Membership Structure of the United Nations Economic and Social Council (ECOSOC) Ensure Fair and Equitable Representation of Global Regions and Socioeconomic Diversity?”

## Interview Questions

1. Given the evolving global economic landscape and shifting power dynamics, how would you assess ECOSOC’s current membership structure in terms of ensuring equitable regional representation?
2. How do ECOSOC’s current institutional mechanisms affect the quality and effectiveness of regional representation, particularly for advance/developing/ smaller nations and island states?
3. What specific reforms would be most impactful in enhancing ECOSOC’s representation structure, and what challenges might arise in implementing these changes?
4. How can Malaysia strategically utilize its 2025 ASEAN Chairmanship to strengthen the ASEAN-ADB-ECOSOC relationship and enhance regional development cooperation?
5. Looking ahead, what systemic changes are needed to ensure ECOSOC remains relevant and effective in promoting equitable regional representation while advancing sustainable development goals?

## AUTHOR'S DECLARATIONS AND ESSENTIAL ETHICAL COMPLIANCES

### *Author's Contributions (in accordance with ICMJE criteria for authorship)*

This article is 100% contributed by the sole author. She conceived and designed the research or analysis, collected the data, contributed to data analysis & interpretation, wrote the article, performed critical revision of the article/paper, edited the article, and supervised and administered the field work.

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No funding was available for the research conducted for and writing of this paper. Therefore, acknowledging any support agency is not applicable in case of this research or the written work. However, informal support of institutional supervisors, colleagues and respondents is duly acknowledged.

### *Research involving human bodies or organs or tissues (Helsinki Declaration)*

The author(s) solemnly declare(s) that this research has not involved any human subject (body or organs) for experimentation. It was not a clinical research. The contexts of human population/participation were only indirectly covered through literature review. Therefore, an Ethical Clearance (from a Committee or Authority) or ethical obligation of Helsinki Declaration does not apply in cases of this study or written work.

### *Research involving animals (ARRIVE Checklist)*

The author(s) solemnly declare(s) that this research has not involved any animal subject (body or organs) for experimentation. The research was not based on laboratory experiment involving any kind of animal. Some contexts of animals are also indirectly covered through literature review. Therefore, an Ethical Clearance (from a Committee or Authority) does not apply in cases of this study or written work.

### *Research on Indigenous Peoples and/or Traditional Knowledge*

The author(s) solemnly declare(s) that this research has not involved Indigenous Peoples as participants or respondents, with the documentation of their Indigenous Knowledge. Some other contexts, if any, of Indigenous Peoples or Indigenous Knowledge are only indirectly covered through literature review. An Ethical Clearance 'to conduct research on indigenous peoples' Indigenous knowledge is also not relevant. Therefore, an Ethical Clearance (from a Committee or Authority) or prior informed consent (PIC) of the respondents or Self-Declaration in this regard does not apply in cases of this study or written work.

### *Research involving Plants*

The author(s) solemnly declare(s) that this research has not involved the plants for experiment or field studies. The contexts of plants were only indirectly covered through literature review. Thus, during this research the author(s) obeyed the principles of the Convention on Biological Diversity and the Convention on the Trade in Endangered Species of Wild Fauna and Flora.

### *(Optional) Research Involving Local Community Participants (Non-Indigenous)*

The author(s) solemnly declare(s) that this research has not involved local community participants or respondents belonging to non-Indigenous peoples. This study did not involve any child in any form directly. The contexts of different humans, people, populations, men/women/children and ethnic people are also indirectly covered through literature review. Therefore, an Ethical Clearance (from a Committee or Authority) and prior informed consent (PIC) of the respondents in this regard are NOT appended.

### *(Optional) PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)*

The author(s) has/have NOT complied with PRISMA standards. It is not relevant in case of this study or written work.

### *Competing Interests/Conflict of Interest*

Author(s) has/have no competing financial, professional, or personal interests from other parties or in publishing this manuscript. There is no conflict of interest with the publisher or the editorial team or the reviewers.

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To see original copy of these declarations signed by Corresponding/First Author (on behalf of other co-authors too), please download associated zip folder [Ethical Declarations] from the published Abstract page accessible through and linked with the DOI: <https://doi.org/10.33002/jpg050203>.

# Critical Limitations of the 1980 U.S. Bureau of Mines Siskind et al. Study (RI 8507)

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## ABSTRACT

The 1980 study by David E. Siskind et al., “*Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting*” (RI 8507), has become a foundational reference for regulatory vibration thresholds across North America and other jurisdictions. Despite its widespread citation, the study suffers from critical limitations in scope, methodology, and applicability — particularly when used as a universal standard in environmental assessments and quarry blast-impact studies, and has the potential to mislead the public and decision makers. This article examines the structural, diagnostic, and planning-related shortcomings of RI 8507, with a focus on its misalignment with Ontario’s diverse receptor types, zoning frameworks, and environmental sensitivities. The analysis reveals that RI 8507 lacks temporal granularity, lacks receptor diversity, lacks diagnostic rigour, and fails to account for modern infrastructure, perceptual impacts, and cumulative exposure over time. These deficiencies undermine its credibility as a universal benchmark and necessitate receptor-specific calibration aligned with contemporary planning and environmental standards.

**Keywords:** Vibration impact assessment; Receptor-specific calibration; Quarry licensing; Environmental compatibility; Planning policy analysis; Structural fatigue modelling

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## 1. INTRODUCTION

RI 8507, published by the U.S. Bureau of Mines in 1980, sought to determine safe levels of ground vibration from surface mine blasting that would not cause damage to residential-type structures (Siskind et al., 1980).<sup>1</sup> Based on 219 production blasts across 76 homes — most of wood-frame construction — the study established a 5.0% probability threshold for “cosmetic” damage at a peak particle velocity (PPV) of 0.5 inches per second (12.7 mm/s). Over time, this threshold has been adopted as a *de facto* standard in proponent-driven environmental or blast impact assessments, including in Ontario, where it has been used to justify large-scale blasting quarry proposals.

The U.S. Office of Surface Mining Reclamation and Enforcement (OSMRE) defines Peak Particle Velocity (PPV) as:

“The maximum instantaneous velocity of a particle at a point during a given interval.”  
(OSMRE, ARblast Technical Resource, 2017)

In practical terms, Peak Particle Velocity (PPV) measures how fast the ground moves at its most intense moment during a blast or vibration event. It describes the maximum speed at which a small portion of the ground shakes when a seismic wave passes through a specific location, typically where a structure or receptor is situated. A seismograph installed at the point of reception records this value, which is then used to assess the potential for cosmetic or structural damage. As acknowledged at p. 5 of the study, seismic energy from blasting maintains particle velocity amplitudes as it travels between materials (rock to soil), due to conservation of energy. However, the frequency and duration of vibration change significantly depending on the ground medium. Softer soils and longer distances stretch the vibration into low-frequency wave trains, which shake the ground more gently but over longer periods and across broader areas. These low-frequency vibrations—especially those below 10 Hz—are more likely to couple with the natural resonant frequencies of residential structures, typically in the 4 to 12 Hz range.

These low-frequency wave trains propagate radially outward from the blast site, concentrating energy along the ground surface. Unlike linear wave paths, radial propagation means that receptors located in any direction from the source—regardless of alignment—may experience significant vibration exposure. This radial spread, combined with surface coupling, increases the likelihood of resonance effects in nearby structures. When vibration frequency aligns with a building’s natural frequency, it can induce whole-structure distortion known as racking—a shearing motion that deforms the building frame, like a rectangle twisting into a parallelogram. Racking introduces shear stresses across walls, joints, and foundations, increasing the risk of cracking, warping, and structural failure. These findings underscore the importance of evaluating not just PPV magnitude, but also frequency content, wave duration, and site-specific soil conditions when assessing vibration impacts on receptors. Long-term repeated blasting, an issue not addressed in the study, can lead to cumulative structural fatigue, increased receptor sensitivity, and elevated risk of cosmetic and structural damage—even if individual blasts remain below regulatory thresholds. Over time, repeated exposure can amplify vibration effects due to soil densification, accumulated material fatigue, and resonance buildup.

Biessikirski & Jakóbczyk (2025) applied an integrated monitoring system that combined geophones to record ground motion and strain gauges to measure stress inside a two-storey brick residential building with a concrete ceiling and no basement, connected to a second building, a car repair shop. The structure was located between 320 and 720 metres from the blasting zone, recording 45 blast events, each lasting about two seconds. Their monitoring showed how blast vibrations actually affect building materials. They found that most vibrations were low frequency (5–13 Hz), overlapping with the natural resonance range of many buildings, which amplified stresses and prolonged shaking inside the

---

<sup>1</sup> The test structure in *Report of Investigations 8896: Effects of Repeated Blasting on a Wood-Frame House* (Stagg, Siskind, Stevens, & Dowding, 1984) was a wood-frame raised bungalow approximately one year old and 1,144 ft<sup>2</sup> (approx. 106.2 m<sup>2</sup>), constructed on a concrete slab with an unfinished concrete block basement, electrical service, and heating and cooling systems, but no plumbing, no interior finish work (e.g., doors, cabinetry), and no home furnishings. It was not fit for occupancy, having been purpose-built for vibration monitoring and left unoccupied throughout the study. Over a two-year period, it was subjected to 587 coal mine production blasts, with peak particle velocities ranging from 0.10 to 6.94 in/s (approx. 2.5 to 176.4 mm/s). Mechanical shaking was later applied to simulate fatigue, but this method fails to replicate the impulsive, multi-frequency seismic waveforms generated by quarry blasting—namely P-waves, S-waves, and surface waves—which interact with subsurface geology and structural components in ways that continuous harmonic shaking cannot. The absence of plumbing, furnishings, and occupancy-related systems eliminates key vibration transmission pathways and resonance amplifiers found in real-world receptors. As such, RI 8896 is diagnostically inappropriate for modern, high-capacity quarry operations and cannot be used to justify licensing without receptor diversity modelling or provisions for licence expiry and periodic review. Retrieved from: <https://stacks.cdc.gov/view/cdc/201767>

building compared to the ground. Importantly, the peak particle velocity (PPV) values they recorded were relatively low, around 1.0–2.5 mm/s, well below the cosmetic threshold of 12.7 mm/s set by Siskind in 1980, yet resonance effects still produced significant structural stress. This demonstrates that Siskind’s PPV-only approach is outdated, since modern receptor analysis must account for frequency content, resonance, and direct stress measurements rather than relying solely on distance-based PPV criteria.

Taken together, these physical and structural dynamics reveal that RI 8507’s narrow scope, outdated assumptions, lack of diagnostic rigour, lack of scientific credibility, and lack of receptor diversity render it unsuitable for universal application. Ontario’s planning frameworks — including the Niagara Escarpment Plan, municipal zoning by-laws and Official Plans, and heritage overlays — require a more nuanced understanding of receptor-specific vibration impacts across a wide range of receptor types. Without such calibration, reliance on RI 8507 risks misleading councils, tribunals, and the public when evaluating quarry proposals for permanent land use compatibility and in preventing adverse blasting impacts.

## 2. STATED PURPOSE OF THE STUDY

The stated purpose of the 1980 study by David E. Siskind and colleagues, titled “*Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting*” and published by the U.S. Bureau of Mines, was to: “Determine safe levels of ground vibration from blasting that would not cause damage to residential-type structures.” The study involved:

- Direct measurements of ground vibration and structural response in 76 homes of undocumented age across nine surface mine locations subjected to 209 documented production blasts. However, the study did not disclose the number of blast holes (detonations) per blast, delay timing, a chronological blast schedule, or a site-specific event log. Table 1 indicates 20 quarry blasts, 170 coal blasts, 19 iron blasts, and 32 construction blasts, for a total of 241 blasts — though only 209 were used for structural response analysis.

Table 1: Blast Type Breakdown and Structural Relevance in RI 8507

<i>Blast type</i>	<i>Total Blasts</i>	<i>Used for structure Response</i>	<i>Receptor type</i>
Coal	170	Yes	Residential structures
Quarry	20	Yes	Residential structures
Iron	19	Yes	Residential structures
Construction	32	No	Not linked to the structure data
Total	241	209	76 residential structures

- Over 70 of the structures subjected to blasting consisted of wood-frame construction, and 56 of 76 structures had basements, of which 24 were finished, with the study cautioning as follows: Safe vibration levels for blasting are given in table 13, being defined as levels unlikely to produce interior cracking or other damage in residences. Implicit in these values are assumptions that the structures are sited on a firm foundation, do not exceed 2 stories, and have the dimensions of typical residences, and that the vibration wave trains are not longer than a few seconds (Siskind et al., 1980, p. 58)
- *Wave train scale mismatch*: The blast-induced ground vibration waves that reach homes are far larger than the footprint of a typical residence. A vibration wave train lasts about 3–4 seconds, and with ground wave speeds of roughly 800 feet per second (244 metres per second), the train extends nearly 3,000 feet (915 metres) in length. At distances greater than 1,000 feet (305 metres), these vibrations often have dominant frequencies of 8–10 Hz. At 10 Hz, each cycle of ground motion spans about 80 feet (24 metres), meaning the front of a house is lifted while the back is simultaneously pulled downward, and vice versa. This alternating distortion repeats 30–40 times during a single blast event. When the frequency of these repeated motions coincides with the natural frequency of the house, resonance occurs. The structural response is amplified, producing

displacements several times greater than those at the foundation, and significantly increasing the risk of cracking, racking, and other forms of damage.<sup>2</sup>

- *Multiple explosions per blast:* In practice, a single blast event consists of multiple individual explosions fired in sequence. Each charge contributes its own vibration pulse, and the overlapping pulses lengthen the wave train beyond the few seconds assumed in Siskind's criteria. This extended shaking increases the number of distortion cycles experienced by a house, broadens the frequency content, and raises the risk of resonance when repeated pulses coincide with the natural frequency of the structure. The cumulative effect of multiple explosions, therefore, amplifies displacement and damage potential well beyond what is predicted by PPV limits. If structures in semi-rural or rural communities are built under different building codes—or with no codes at all in diverse soil conditions (Bapir et al., 2023) — the assumptions in Siskind's 1980 criteria become even less reliable.
- *Code variability:* Homes in the Siskind study were built under relatively uniform U.S. residential codes of the time. Rural structures may follow older, less stringent codes or local practices that don't enforce vibration-resistant design (Singh et al., 2008; Pan et al., 2025).
- *No codes at all:* In many rural areas, especially for farmhouses, barns, or heritage buildings, construction may have been informal, without engineering oversight. These buildings often lack reinforcement, standardized foundations, or modern materials, making them more vulnerable to cracking and resonance.
- *Ontario Building Code:* The Ontario Building Code was enacted in 1975<sup>3</sup>, but many rural Ontario structures — particularly older farmhouses, barns, and heritage buildings — were built before its adoption or under exemptions. Although the actual number is unknown, housing data confirm that a substantial share of rural dwellings predate or fall outside modern building codes, but they contain no provisions for blast vibration resilience. This means that both non-code rural structures and code-compliant typical homes remain vulnerable when exposed to prolonged blasting operations. In rural communities, 31% of dwellings were constructed in 1960 or earlier, and another 28% were constructed from 1961 to 1980. 29% of dwellings in indigenous communities need major repairs, which is much higher than the provincial average of 6% (Rural Ontario Institute, 2023).
- *Structural diversity:* Without consistent codes, there is wide variation in wall thickness, mortar quality, framing methods, and foundation types. This variability means vibration thresholds cannot be generalized—some buildings may fail at much lower PPV levels than the “safe” limits suggested (Singh et al., 2008).
- *Variable footprints:* The study assumed “typical residences” with uniform dimensions, but rural buildings often have irregular or expansive footprints—long farmhouses, wide barns, or heritage stone structures. These geometries alter modal frequencies and foundation interaction, lowering natural frequencies and increasing susceptibility to low-frequency blast vibrations. The assumption of uniform footprints, therefore, underestimates resonance risks.
- *Court acknowledgement and resonance amplification:* According to the Surface Mining Control and Reclamation Act (SMCRA) and F-SMCRA, low-frequency blasting is problematic and can cause structural damage, as found in *Jarrett v. DNR and Amax Coal Company* (1992).<sup>4</sup>

*113. As with all other structures, homes have one or more natural (or harmonic or resonant) frequencies. The mathematical effect of a natural frequency is that induced vibrations, which are the same frequency as a natural frequency, will cause vibrations to increase with time rather than decrease with time. As a practical matter, this means the midwall response of a home subjected to vibrations from a blast (or any other source) could be a displacement of up to four times the displacement at the foundation. It can also cause "racking" or shaking of the structure.*

*114. When such a phenomenon occurs, it clearly places considerable stress on the mortar between bricks, plaster walls, and corners of a structure.*

<sup>2</sup> Information provided by Dr. Kiger (personal communication)

<sup>3</sup> The Ontario Building Code was first enacted under *Ontario Regulation 925/75* in 1975 and is now governed by the *Building Code Act, 1992*. See Ontario Ministry of Municipal Affairs and Housing (1975). *Ontario Building Code, O. Reg. 925/75*. Government of Ontario. Updated under the *Building Code Act, 1992*, S.O. 1992, c. 23.

<sup>4</sup> *Jarrett v. DNR and Amax Coal Company*, 5 CADDNAR 265 (1992), <https://www.in.gov/nrc/decision/89-106r.v5.html>.

115. ...OSM report RI 8507 indicates the natural frequency of wood frame structures is in the 5-10 Hz range for racking. Natural frequencies of one-story homes can be as high as 18 Hz, but of course, the initial displacement at 18 Hz is only 1/2 of the displacement of a 9 Hz frequency for the same peak particle velocity [PPV]. This study concludes that frequencies below 10 Hz are the most serious ones.

- **Cottage conversions:** Market evidence shows that a growing share of Ontario cottages are being converted to year-round residences. According to RE/MAX Canada (2025), 30% of prospective cottage buyers intend permanent occupancy. Many cottages were originally built as seasonal dwellings, often lacking insulation, standardized foundations, or vibration-resistant design. Their conversion to permanent residences does not eliminate these vulnerabilities, further underscoring the inadequacy of typical dwelling-based PPV criteria for rural communities.
- **Regulatory gap:** Applying frequency-dependent criteria derived from code-compliant typical homes to non-code, structurally diverse rural buildings risks underestimating damage potential. It assumes a level of resilience that simply isn't present in many older, irregular, or informally built structures, leaving rural communities inadequately protected against longer vibration trains, cumulative blasting, and interior amplification effects, all of which increase damage risk in vulnerable rural structures.

Siskind's subsequent 1990 study of Indiana coal mines confirmed that low-frequency blast vibrations are not rare anomalies but predictable outcomes of blasting practices and geology. These vibrations, often below 20 Hz, lasted longer than the "few seconds" assumed in RI 8507 and were amplified by overlapping detonations and soil conditions. With natural frequencies of rural homes in the 5–10 Hz range, the study concluded that frequencies below 10 Hz are the most serious. This reinforces that the derived PPV criteria fail to account for resonance amplification and extended wave trains, leaving rural Ontario communities exposed to underestimated risks (Siskind, 1990).

- Establishment of a 5.0% probability "cosmetic" damage threshold value per event based on peak particle velocity (PPV) of 0.5 inches per second (12.7 mm/s), which measures the maximum instantaneous speed of ground particle movement at a specific location, while the wavefront continues to propagate through the ground and structures before, at, and beyond the receptor.
- The amplification of ground vibrations was between 2 and 4 for interior structural elements compared to foundation measurements, especially walls and ceilings, and most pronounced at lower frequencies, especially below 20 Hz, with no direct measurement of blasts with dominant frequencies below 5 Hz (Dowding, 1996). The study focused narrowly on residential-type structures, excluding other receptor types and diagnostic criteria.
- The pre- and post-blast inspections of each structure were based solely on visual inspections, limited to accessible areas and excluding concealed finishes or structural elements behind drywall, ceiling panels, or within finished basements.
- Figure 10 of the U.S. Bureau of Mines study *RI 8507* presents a scatter plot of peak particle velocity (PPV) data collected from nine surface mine blasting operations. The data illustrate significant variability in ground vibration intensity at fixed scaled distances, undermining the reliability of universal PPV thresholds.<sup>5</sup>

### Comparative Analysis of Two Scaled Distance Examples

A fixed scaled distance refers to a theoretical, predetermined threshold (e.g., 50 ft/lb<sup>0.5</sup>) used to limit vibration levels when no seismic instrumentation is available. At 200 metres (scaled distance = 51.2 ft/lb<sup>0.5</sup>):

- PPV values range from 0.033 in/sec (0.84 mm/s) to 1.3 in/sec (33 mm/s)
- This reflects a 40× variation and a 3,848% increase from minimum to maximum
- RI 8507 found that interior structural elements (e.g., walls, ceilings) can experience 2× to 3× amplification of ground-measured PPV, especially at frequencies below 20 Hz
- Applying this amplification to the upper PPV range yields 2.6 to 3.9 in/sec (66 to 99 mm/s) — well above the cosmetic damage threshold of 0.5 in/sec (12.7 mm/s)
- At 300 metres (scaled distance = 76.5 ft/lb<sup>0.5</sup>):

<sup>5</sup> Miller Paving Limited's (Miller) quarry located in the Municipality of McNab/Braeside, Ontario: Dr. Kiger's Expert Report prepared January 12, 2015.

- PPV values range from 0.01 in/sec (0.25 mm/s) to 0.3 in/sec (7.6 mm/s)
- This reflects a 30× variation and a 2,900% increase
- Amplified PPV at the upper range reaches 0.6 to 0.9 in/sec (15.2 to 22.9 mm/s) — again exceeding the cosmetic damage threshold

These examples demonstrate that even at fixed scaled distances, PPV values fluctuate dramatically due to site-specific geology, blast configuration, and receptor conditions and configurations. RI 8507's reliance on scaled distance as a predictive tool is therefore diagnostically unstable.

- The study concedes that there may be no absolute minimum vibration damage threshold, and does not account for long-term repeated blasting:

7. All homes eventually crack because of a variety of environmental stresses, including humidity and temperature changes, settlement from consolidation and variations in ground moisture, wind, and even water absorption from tree roots. Consequently, there may be no absolute minimum vibration damage threshold when the vibration (from any cause, for instance, slamming a door) could, in some cases, precipitate a crack about to occur. (p. 68)

- The study also cautions that

Neighbors around mining operations and other blasting...require protection of their property and health so that they do not bear an unreasonable personal cost. (p. 4)

Protection of property extends beyond physical integrity to include economic impacts such as diminished market rental income and reduced market value, since blasting-related nuisance, stigma, and perception of risk can measurably erode both occupancy demand and resale potential even when PPV thresholds are technically met.

- The study does not disclose the number of production blasts each structure was exposed to, with table 3, listing 209 production blasts (20 involving quarries) across nine surface mines without a cumulative summary, showing Structure 58, near a coal mine, as having received seven blasts (Shots 203-209), while most structures were exposed to only one or two blasts, undermining the study's relevance for long-term, high-frequency quarry blasting operations in Ontario, where licences have no expiry date.
- The study does not disclose whether blasting took place above or below the water table, how deep the blasts were, or what the local groundwater conditions were like. Because its vibration limits were based on mines in dry ground, those numbers can't simply be applied to quarries that blast below the water table. When rock is saturated with water, vibrations travel differently — they can be stronger and carry farther, which increases the risk of damage to buildings and the environment. Without taking groundwater and geology into account, using the study's thresholds for deep or wet blasting gives a misleading picture of the vulnerability of nearby homes and ecosystems.
- The study thresholds are often cited as universal standards despite their narrow scope, leading to inappropriate application in environmental assessments and quarry blasting impact studies without receptor-specific calibration.
- The RI 8507 study was published in 1980, before modern environmental assessment standards and cumulative risk frameworks were enacted to protect the health, safety, and welfare of the community.

### 3. FOUNDATION FOR REGULATORY VIBRATION LIMITS

The stated research has become the foundation for regulatory vibration limits and has been widely cited in environmental assessments and quarry impact studies — including in Ontario by Golder Associates Inc. in its 2023 proponent-driven Blast Impact Assessment (Golder Associates Ltd., 2023) prepared for Votorantim Cimentos' (St. Mary's/CBM) proposed 800-acre blasting quarry in the Town of Caledon — despite its limited scope regarding receptor types (structures, monuments, site improvements, human and non-human life forms) and diagnostic criteria. Over a period of 100 years, at 100 blasts yearly, with 190 blast holes per blast, various stationary and mobile receptor types would be exposed to a total of 1.9 million detonations. This scale of detonations represents a level of structural, ecological, and human exposure that exponentially exceeds the short-term, low-frequency conditions modelled in RI 8507, rendering its thresholds diagnostically and regulatorily insufficient for modern large-scale quarry operations. RI 8507's most exposed structure received only seven blasts near a coal mine. It did not model

long-term fatigue, receptor diversity, or ecological thresholds — rendering its use in quarry licensing without periodic review or expiry date diagnostically inappropriate and regulatorily insufficient.

#### 4. SENSITIVE RECEPTORS AND SENSITIVE LAND USES

In Ontario, the ARA, which controls the operational aspects of aggregate extraction, uses the term “sensitive receptor” as the point of vibration impact, which it defines as:

- (a) a school or child care centre, or (b) any residence or facility at which at least one person sleeps, including a long-term care home, hospital, trailer park, or campground. (O. Reg. 244/97)

The ARA also imposes time-of-day restrictions on blasting. Specifically:

- (5) A licence, aggregate permit, or wayside permit that authorizes blasting at the site is subject to the following conditions:

- 1. No blasting shall occur on a holiday, or between 6 p.m. and 8 a.m., unless the permittee holds an aggregate permit and there is no sensitive receptor located within 2,000 metres of the area in which the blasting takes place.

There is no rational basis for limiting this restriction on blasting to time-of-day alone on holidays, given that a licence has no expiry date. Post-COVID-19, as of Q2 2025, home-based businesses have become increasingly popular, according to Made in CA (2025). Locally, in 2019, pre-COVID-19, the Town of Caledon had 6,000 home-based businesses, double the 3,042 businesses with employees (MDB Insight Inc., 2020) and are supported by the policies of Section 2.6 Rural Lands in Municipalities of PPS (2024) and its Vision statement:

Growth and development will be prioritized within urban and rural settlements that will, in turn, support and protect the long-term viability of *rural areas*, local food production, and the *agri-food network*. In addition, resources, including natural areas, water, aggregates, and agricultural lands, will be protected. Potential risks to public health or safety or of property damage from natural hazards and human-made hazards, including the risks associated with the impacts of climate change, will be mitigated....Above all, Ontario will continue to be a great place to live, work, and visit, where all Ontarians enjoy a high standard of living and an exceptional quality of life (p. 1).

A 2010 study (Wahid) of 49 Environmental Impact Assessment (EIA) reports from 1995 to 2002 on housing construction activity proposed that for a quarrying or any other industry, there should be at least three kilometers (3,000 metres) from the site. However, due to the growth in population, a lot of housing has been built near quarries, with many negative impacts such as cracks in houses, broken roads, dirt and dust in the atmosphere, and noise from blasting (Ibrahim et al., 2019, p. 1).

Accordingly, a permanent prohibition on blasting within a minimum baseline 2,000-metre radius would better reflect the precautionary principle and cumulative risks posed by unrestricted, high-capacity, multi-hole detonations over the lifespan of a quarry. This locational constraint on the prohibition of blasting quarries is consistent with best practices in other jurisdictions, such as Muskoka Lake, Ontario (2,000 metres from lakes and rivers) (Township of Muskoka Lakes, 2023, p. 193) and Grundy County, Tennessee, (1,524 metres from sensitive land uses) (Sevelka, 2025). ARA’s existing time-based restriction implicitly acknowledges the adverse effects of blasting, such as vibration, noise, flyrock, and structural amplification—yet it fails to address the spatial and temporal persistence of these impacts. Time-based restrictions regulate when blasting occurs, but not where its impacts persist; only spatial buffers can mitigate cumulative damage to receptors.

A permanent spatial buffer would enable receptor-based calibration, reinforce permanent municipal land use compatibility, and safeguard long-term community health, property values (Sevelka, 2022) and ecological integrity. The 1993 report by The Commission on Land Use and the Rural Environment, released by the New Brunswick government, acknowledges the “obnoxious” nature and significant adverse effects of pits and quarries, mainly experienced in relation to residential development, in addition to the aggregate industry’s impact on the environment.

Activities that are essential in the operation of pits and quarries are often a cause of conflict. This is mainly because of the relatively obnoxious nature of this industry. Those conflicts are experienced primarily in relation to residential development. Sometimes the pit operation starts up beside an established house, while other times the house is constructed next to an existing pit. Other conflicts are less obvious, but just as real. They have to do with the proximity of pit and quarry operations to other

resources, such as agriculture or forestry. There are also times when the quality of the environment itself is affected by pit and quarry operations.

To people living near pit and quarry operations, the noise, dust, vibrations, [flyrock debris], operating hours, and safety factors are serious points of contention. Noise caused by operations themselves, from blasting, and from trucks can be very disturbing to residents living near a quarry. The sound of explosives and machinery, which are necessary for normal quarry operations, can be very disturbing to surrounding residential areas, but it can also affect sensitive wildlife species for kilometres around the site. Blasting and the resulting vibrations can cause damage to wells and foundations. The dust which is normally generated from excavation, blasting, screening, and crushing operations can have an impact on the health of humans, plants, and animals, as well as degrade the surface of dwellings and vehicles. The concerns for operating hours and public safety are most prevalent where blasting and heavy equipment are used, and with respect to abandoned operations in populated areas. The negative social impacts of such operations next to a residential area can affect property value, community lifestyle, and the general appearance of the neighbourhood (Government of New Brunswick, 1993, pp. 238-239).

The need for spatial buffers is further underscored by the absence of any evaluation of cumulative or long-term vibration exposure in legacy studies such as the U.S. Bureau of Mines, Report of Investigations 8507 (1980), which focused solely on discrete blast events. These studies fail to account for progressive fatigue, microfracturing, seal degradation, and settlement shifts that can result from repeated low-level vibration over time. Such impacts often manifest gradually, beyond the scope of short-term observation windows, and are especially relevant in rural and semi-rural zones where receptor redundancy is limited and structural resilience varies. Long-term vibration exposure can compromise foundation integrity, joint stability, and mechanical alignment, particularly in buildings with unreinforced masonry, riveted steel, or aging HVAC and plumbing systems. Compatibility studies that ignore cumulative exposure risk underrepresent non-visible damage, mischaracterize receptor vulnerability, and violate planning instruments such as PPS 2024 Section 1.2.6.1, which requires the permanent protection of sensitive land uses and infrastructure. These cumulative effects must be modelled and disclosed as part of any compatibility assessment, with monitoring protocols designed to detect sub-damage thresholds and progressive degradation over time.

In the abovementioned 1980 report by Siskind et al, the authors establish 0.5 in/sec (12.7 mm/s) as the “threshold” for damage to structures, and they define “threshold” as a 5% probability of cosmetic damage. The probability of damage to a home may be relatively small in any single blasting event. However, according to Dr. Kiger<sup>6</sup>, numerous opportunities for an unlikely occurrence (like damage to the home) will result in a very likely occurrence of damage. For example, if the probability of damage ( $P_d$ ) in any single blasting event is 0.05, or 5 percent, then the probability of not being damaged ( $P_u$ ) is 95 percent. One can use the probability law of independent events to calculate the probability of damage occurring at least once in 100 events.<sup>7</sup> Thus, assuming the probability of damage is the same for each event, 0.05, then the probability of not being damaged at least once in 100 events is:

$$P_{u-100} = (0.95)^{100} = 0.006$$

And the probability of the structure being damaged in 100 explosions is 1 minus the probability that it is not damaged, thus:

$$P_{d-100} = 1 - 0.006 = 0.994$$

This implies that the probability of damage in 100 events is about 99 percent, meaning damage is almost certain if the homes are subjected to these blast-induced ground vibrations numerous times. Thus, even though damage is unlikely to result from any single blasting event, some damage in the form of cracking of walls, ceiling, tile, concrete, nail popping, loosening of framing joints, etc., becomes very likely over time with numerous repetitions of blast-induced ground vibrations. And once damage occurs (like cracking, nail pops, or framing joints loosening), that damage will rapidly increase with repeated exposure to the vibrations, even at lower levels of vibrations.

This concern was reinforced in *Chase Limited Partnership*, Case No. BA 95-58E (May 13, 2024)<sup>8</sup>, where the tribunal rejected the petitioner’s reliance on outdated science and noted the absence of any

<sup>6</sup> Dr. Kiger, January 19, 2015, Expert Report: Miller Paving Limited’s quarry in the Municipality of McNab/Braeside, Ontario.

<sup>7</sup> See Henry L. Alder & Edward B. Roessler. *Introduction to Probability and Statistics* (3rd ed.). San Francisco: W.H. Freeman and Company, 1964.

<sup>8</sup> Howard County Board of Appeals Hearing Examiner. (2024). *Decision and Order in the Matter of Chase Land, LLC f/k/a Chase Limited Partnership*, Case No. BA 95-58E. Issued May 13, 2024. BA-95-058-DO.pdf

study examining the long-term effects of 20+ years of blasting on two-storey residential structures. The tribunal emphasized that “old science is not always good science,” and that legacy studies like the 1984 U.S. Bureau of Mines report (RI 8896) were insufficient to dismiss cumulative damage claims. The tribunal emphasized the importance of cumulative impacts and receptor testimony from homeowners, noting that,

Petitioner claims that because the homeowners are not geologists or are not familiar with the science of blasting or vibrations, they are not qualified to testify to their lived experiences. This is a fundamental misunderstanding of eye-witness testimony and, again, Petitioner’s burden in this case. The record is replete with testimony from residents that they feel the blasts almost every week and that blast intensity has become greater over time. Residents also testified that they have seen things fall off their walls and their homes shake during a blast. There is no doubt they feel the blasts, and they have seen the damage to their properties increase over time (p. 23).

This decision underscores that homeowner receptor testimony and cumulative exposure evidence must be integrated into compatibility assessments, rather than dismissed through reliance on legacy Bureau of Mines criteria. This inferred acknowledgement is further reflected in the Municipality of East Ferris’ 2023 settlement agreement with 1851477 Ontario Inc., which mandates advance notification to all property owners of developed or unimproved land within 2,000 metres of the quarry property line (not the excavation limit) before any blasting activity. This condition of the quarry expansion, embedded in the ARA licence<sup>9</sup>, was negotiated through the municipal land use approval process and underscores the recognized need for proactive receptor engagement and localized impact mitigation through distance.

Two objectors to this quarry expansion described the impact on the community from a May 19, 2022, blast at the quarry up to two kilometres (2,000 metres) away:

“On May 19, 2022, my house and a lot of others were shaken by a massive explosion that we never received any notice of. I live a mile from pitt [sic] and my house and garage shook massively. This is unacceptable. The noise pollution of this nature is not acceptable in this residential area. Working hard all day and coming home to this noise pollution isn’t how I want to spend my summer” (Objector, June 30, 2022, <https://ero.ontario.ca/comment/61187>).

“Degagne Carpentry has been trucking material out of this pit for over a month now. They completely disregarded the half-loading restrictions that were in effect till 15 May. Additionally, they have been blasting for over a week, with today, 19 May 2022, around 6:30 p.m., the blast being the biggest and providing no notice to the residents of Lavigne Rd. The blast shook houses 2 km away” (Objector, May 19, 2022, <https://ero.ontario.ca/comment/61157>).

The concept of “sensitive receptors” cannot be interpreted narrowly or in isolation. In land-use planning, it must be understood within the broader context of “sensitive land uses” under the policy framework of the *Provincial Planning Statement* (2024), The PPS provides the most authoritative and contemporary definition, situating sensitive receptors within the larger category of sensitive land uses, clarifying the types of activities and environments that require heightened protection from adverse effects. As the PPS explains:

*Sensitive land uses:* means buildings, amenity areas, or outdoor spaces where routine or normal activities occurring at reasonably expected times would experience one or more adverse effects from contaminant discharges generated by a nearby major facility. Sensitive land uses may be a part of the natural or built environment. Examples may include, but are not limited to: residences, day care centres, and educational and health facilities (p. 51).

Importantly, ARA has no statutory authority to interfere with or authorize interference with the property rights of private third-party property owners or tenants, reinforcing the licensing limits of regulatory reach. All monitoring and testing equipment must remain on-site. Beyond the perimeter of the licensed area, land use, both onsite and offsite, is governed by the *Planning Act*, including the

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<sup>9</sup> In 2023, Degagne Aggregates (1851477 Ontario Inc.) entered into an Agreement with the Municipality of East Ferris requiring advance notice of blasting to all landowners within 2 kilometres (2,000 metres) of the quarry property line. While this policy acknowledges the far-reaching effects of quarry operations—including noise, fugitive dust, toxic fumes, flyrock debris and structural impact—it does nothing to prevent or mitigate these health and environmental risks. This so-called “advance notice” offers no real protection. It does not safeguard homes, businesses or sensitive land uses from potential damage. Instead, it merely warns people to brace for impact—forcing residents and their pets into a cycle of uncertainty, disruption and anxiety every time explosives are detonated. Tenants and transient and mobile populations are excluded. This precedent underscores the need for receptor modelling that goes beyond notification and addresses actual risk mitigation through permanent land use compatibility.

*Provincial Planning Statement* (2024), municipal Official Plans and Zoning By-laws. This reinforces the limits of regulatory reach and the primacy of municipal control over receptor protection, land use compatibility, property rights, property values, and long-term community planning.

These findings align with international literature on quarry proximity and resident well-being, including Ibrahim (2019), which documents structural damage, airborne particulates, and acoustic disruption in communities adjacent to quarry operations. They also underscore the need for land use compatibility studies to incorporate both statutory receptor definitions and broader land use sensitivity criteria, calibrated to spatial and perceptual risk thresholds.

## 5. INADVERTENT STERILIZATION OF LAND POST-LICENCING

Once an aggregate licence is issued, especially in Ontario, where such licences have no expiry date and no limit on the depth of extraction, neighbouring vacant “as-of-right” and developed lands lose their functional potential and lawful right for development, expansion, or redevelopment because they are now deemed incompatible, inappropriate, or infeasible. These land use constraints, functionally equivalent to permanent easements, extend to both private and public lands. In effect, the use and enjoyment of these lands are curtailed, health, safety, and welfare are compromised, and the marketability and value of these lands are materially impaired for the duration of aggregate operations.

The costs associated with aggregate extraction are externalized, such as reduced development yield, impaired financing, or delayed approvals, with innocent third-party property owners bearing the financial burden, while the operator reaps the financial profits. Municipalities without adequate land use policies in place to prevent permanent land use incompatibility or land use planners lacking knowledge of receptor-based impact forecasting tools are ultimately responsible for undermining the long-term sustainability and economic viability of the community. This sterilization occurs not through formal downzoning, but through the operational reality that adjacent lands are now deemed incompatible with sensitive land uses such as residential, institutional, mixed-use development, or recreational. As Sevelka (2025) observes, Ontario’s Aggregate Resources Act (Ontario Ministry of Natural Resources and Forestry, 1997) fails to coordinate effectively with the Planning Act, leaving municipalities without statutory tools to forecast or mitigate receptor sterilization. The absence of compatibility overlays, setback calibration, and receptor mapping allows aggregate operations to override local planning objectives, nullifying “as-of-right” permissions on adjacent lands and creating de facto takings without compensation.

This effect has been observed in the Township of Assiginack, where an owner of land adjoining a “zombie pit and quarry,” which at the time of the severance request had not been operational for eight years, was denied a severance for the creation and sale of a building lot despite full compliance with local rural zoning and servicing standards, and absent any site-specific constraints (Sevelka, 2022; Sasvari, 2023).

## 6. STUDY DEFICIENCIES AND OMISSIONS

As such, RI 8507 cannot be used as a universal standard without structural, functional, and perceptual calibration aligned with Ontario’s planning and environmental frameworks. The shortcomings and omissions of this outdated study are listed below:

- *Lack of property-owner consent protocols for monitoring equipment.* The 1980 study and related receptor monitoring practices do not address the legal requirement for property-owner consent before installing seismographs on third-party property. In Ontario and other common law jurisdictions, placing monitoring equipment or any other type of equipment on private property without explicit permission constitutes unlawful trespass under statute and established common law principles (e.g., intrusion upon land without consent),<sup>10,11,12</sup> undermining the legitimacy of vibration data and exposing operators to civil liability.

<sup>10</sup> Ontario Government (2020). *Security from Trespass and Protecting Food Safety Act, 2020, S.O. 2020, c. 9.* Security from Trespass and Protecting Food Safety Act, 2020, S.O. 2020, c. 9. Retrieved from: <https://www.ontario.ca/laws/statute/20s09>

<sup>11</sup> Government of Ontario (1990). *Trespass to Property Act, R.S.O. 1990, c. T.21.* Trespass to Property Act, R.S.O. 1990, c. T.21. Retrieved from: <https://www.ontario.ca/laws/statute/90t21>

<sup>12</sup> *Pattison v. McGinley Bros Inc. et al.*, 2023 ONSC 1393 (CanLII), affirms that trespass to land is actionable per se: “a person who enters onto another’s land without permission commits a trespass, even if no damage is caused.” The Ontario Superior Court of Justice granted a permanent injunction, holding that continued unauthorized use of the plaintiff’s property—including physical

- *Inadequate measures for documenting vibration damage.* The 1980 study did not employ instrumentation capable of detecting microfractures or cumulative fatigue, relying instead on visual inspections and seismographic PPV readings. While technologies such as ultrasonic testing and acoustic emission monitoring existed at the time, they were not integrated, limiting the study's diagnostic relevance for assessing long-term structural integrity under repeated blasting exposure. These diagnostic tools are costly and require specialized training to operate and interpret.
- *Geomechanical discontinuities and wave reflection complexity.* The 1980 study assumes that vibration waves travel through solid rock in a uniform and predictable way. However, in reality, the rock between a blast site and a structure is often fractured, layered, or previously disturbed by earlier blasts. These natural and man-made breaks—called discontinuities—can weaken and scatter vibration waves, changing their direction and strength (Hudson, 1981; Kikuchi, 1981), and may amplify vibration in specific directions depending on subsurface geometry and blast orientation. Field studies confirm that local geology, including fractured strata and bedding planes, can significantly alter vibration transmission (Reil, 1985). In addition, the act of fracturing the rock during blasting creates new waves after each blast (detonation of each blast hole) that interact with each other in complex ways, sometimes making the vibrations stronger in certain areas (Achenbach, 1984; Rice, 1980). When these waves encounter open surfaces such as quarry walls or tunnel faces, they reflect in multiple directions, producing both up-and-down waves (compressional or P-waves) and side-to-side waves (shear or S-waves). The angles and magnitudes of these reflections depend on the angle of incidence and the wave velocities of the surrounding rock (Aki and Richards, 1980; Rinehart, 1975). Furthermore, when body waves reach the ground surface, they generate surface waves, primarily rolling waves called Rayleigh waves (R), which travel along the earth's surface in a motion that combines vertical and horizontal displacement, allowing them to bend around physical barriers and carry damaging energy along the surface (McLaughlin et al., 2004). These waves are particularly damaging to shallow foundations, finished basements, and sub-flooring systems, as they can amplify structural response and perceptual discomfort near receptors. These interactions can also change wave types, for example, from P-waves to S-waves or Rayleigh waves, and shift vibration frequencies, increasing the risk of resonance in mechanical systems and building finishes. Without accounting for these propagation complexities, damage attribution becomes unreliable — especially in concealed or resonance-sensitive areas — where strain energy may concentrate unpredictably. None of these effects are considered in the 1980 study, which limits its applicability in geologically complex or previously disturbed environments and undermines its compatibility with receptor-specific modelling frameworks such as those outlined in NS 8141-1 + A2 and Ontario's Provincial Planning Statement (PPS), which requires land use decisions to consider actual impacts on sensitive receptors in the context of sensitive land uses—not just distance.
- *Lack of temporal granularity.* The study limits the ability to correlate blast timing with seasonal soil conditions, weather events, or structural fatigue progression, which can significantly affect wave propagation, amplification, and structural response. Without time-resolved data, it cannot account for variations in soil moisture, freeze-thaw cycles, or meteorological shifts that affect subsurface elasticity and damping. Moreover, the subsurface conditions between a given blast site and each receptor-type are unknowable without site-specific geotechnical modelling, further limiting the applicability of the findings to regionally specific planning contexts.
- *Absence of site-specific logs.* The study does not document the structural, geotechnical, or environmental characteristics of individual receptors, undermining reproducibility and receptor-specific calibration. This omission is especially problematic in Ontario, where freeze-thaw cycles, high-water tables, and heritage overlays materially influence vibration response. Without receptor-level documentation, it is impossible to establish tailored thresholds or conduct compatibility assessments under planning frameworks that require site-specific analysis.
- *Ambiguity in the definition of “cosmetic damage.”* The report established 0.5 in/sec (12.7 mm/s) as the threshold for cosmetic damage, with a 5% probability per event. However, the term “cosmetic” was never formally defined, whether superficial (e.g., drywall cracks) or indicative of deeper structural compromise. The study documented cracking in plaster and gypsum board walls

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intrusion by persons or objects—was sufficient to justify equitable relief and punitive damages. Retrieved from:  
<https://canlii.ca/t/jwkdg>.

but did not distinguish between aesthetic and functional damage. Moreover, the report did not consider damage to home contents such as artwork, framed photographs, mirrors, ceramics, family heirlooms, chinaware, crystalware, or electronics—items that may be sensitive to micro-movements, wall flexure, or particulate migration. These losses are rarely captured in structural assessments yet carry significant financial, emotional, and disclosure implications. Their exclusion further undermines the reliability of the cosmetic damage threshold and its applicability to real-world receptor conditions.

- *Lack of disclosure regarding structural characteristics.* The study monitored 76 residential structures, but did not disclose their quality of construction, age, size, footprint, or internal layout. This omission limits the applicability of its findings to regionally specific building stock, which may differ in construction methods, code compliance, and structural configuration, in jurisdictions such as Ontario, where building age, code evolution, and heritage overlays significantly influence vibration response. Ontario had no unified building code before 1975, and construction quality varies widely from dwelling to dwelling in semi-rural and rural settlement areas.
- *No evaluation of wells, septic systems, or site improvements.* The study excluded hydrogeological monitoring and did not assess vibration effects on groundwater flow, well integrity, septic fields, driveways, walkways, retaining walls, swimming pools, outbuildings, exterior sump pumps, propane tanks, or outdoor cisterns—despite their vulnerability in rural and semi-rural settlement areas. These features are often unreinforced or legacy installations sensitive to micro-movements, soil displacement, or structural fatigue. Propane tanks, in particular, may be subject to anchoring stress, line misalignment, or valve disruption under vibration exposure. Their omission limits the study’s applicability to receptor types common in Ontario’s rural and semi-rural settlement planning contexts, where unreinforced or legacy infrastructure is common and particularly vulnerable to vibration-induced stress.
- *No assessment of renewable energy infrastructure.* The study did not evaluate impacts on rooftop solar panels, ground-mounted arrays, battery storage units, or geothermal boreholes. These systems are increasingly common in rural and semi-rural Ontario and may be sensitive to vibration-induced microfractures, grout seal failure, or mounting fatigue. Additionally, the study did not consider dust migration or particulate deposition resulting from blasting activities. Fine particulate matter can accumulate on solar panels, reducing energy yield and requiring more frequent cleaning. Dust infiltration may also affect battery enclosures, inverters, and geothermal manifolds—compromising performance, longevity, and safety (Nezamisavojbolaghi et al., 2023). These disruptions lead to increased maintenance frequency, premature component failure, and elevated replacement costs. These impacts reduce system lifespan and return on investment for property owners and small-scale operators (Geetha et al., 2025).
- *No consideration of heritage structures.* The study did not assess impacts on historic buildings, heritage-designated structures, or monuments, which may be more vulnerable to vibration due to aged materials, mortar fatigue, and preservation constraints. This omission is critical in jurisdictions like Caledon, where cultural heritage assets are protected under municipal and provincial planning frameworks.<sup>13</sup> Section 2.6 of the Provincial Planning Statement (PPS 2024) affirms that cultural heritage resources must be identified, conserved, and protected during land use planning and development. This includes built heritage resources, cultural heritage landscapes, and archaeological sites—especially in municipalities like Caledon with active heritage conservation policies.

#### PPS 2024 – Section 2.6: Cultural Heritage Resources: Key Provisions

- 2.6.1: Significant built heritage resources and significant cultural heritage landscapes shall be conserved.
- 2.6.2: “Development and site alteration shall not be permitted on lands containing archaeological resources or areas of archaeological potential unless significant archaeological resources have been conserved.”

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<sup>13</sup> GoodLot Farmstead Brewing Co. (n.d.). *GoodLot Farmstead Brewing Co.* Retrieved November 28, 2025, from <https://www.goodlot.beer/>

- 2.6.3: Development and site alteration shall not be permitted on adjacent lands to protected heritage property except where it has been demonstrated that the heritage attributes of the protected heritage property will be conserved.

These provisions are binding under the Planning Act and apply to all municipalities in Ontario. They require that vibration impacts on heritage structures be assessed and mitigated, especially where aged materials, mortar fatigue, or preservation constraints may heighten vulnerability.

- *Exclusion of agriculture and recreational outbuildings, and public-use receptors.* The study fails to assess a broad class of vibration-sensitive structures commonly found within the 2,000-metre blast radius of the Votorantim Cimentos (St Marys/CBM) quarry application proposed quarry site in Caledon, including legacy stone foundations, heritage-grade structures, and seasonal tourism infrastructure such as barns, greenhouses, root cellars, chicken coops, animal shelters, seasonal bunkhouses and cabins, detached garages, sheds, cabanas, outdoor theatres, gazebos, bandstands, outdoor kitchens, BBQ shelters, rest stations, public washrooms, trailhead kiosks, and interpretive shelters. These structures—often slab-mounted, post-set, or lightly framed—are prevalent in rural and semi-rural settlement areas with mixed-use zoning and legacy construction practices. Their structural characteristics make them particularly vulnerable to cumulative vibration impacts such as anchoring fatigue, frame distortion, panel displacement, and slab cracking. The exclusion of these receptors not only undermines statutory compliance but also compromises the integrity of land use compatibility modelling, emergency response planning, and rural service continuity. These receptors often co-locate near or in rural hamlets and ecological corridors, where cumulative exposure to vibration, overpressure, and emergency response delays poses heightened risk to public safety, infrastructure integrity, and ecological continuity. These omissions materially affect receptor mapping within 2,000 metres, setback modelling, and mitigation planning required under PPS 2024 and the Caledon Official Plan. Structures located within 500 metres of the proposed blast radius face heightened exposure to vibration, overpressure, and infrastructure fatigue.

The following site-specific examples illustrate the range and vulnerability of receptors (sensitive land uses) omitted from the blast impact assessment:

- *Alton Greenhouses & Garden Centre (19598 Main Street, Village of Alton)<sup>14</sup>* – commercial greenhouse with slab-mounted display shelters and public access.
- *Forks of the Credit Provincial Park (17760 McLaren Road, main entrance)<sup>15</sup>* – within 500 metres of the proposed quarry boundary, – public-use washrooms, rest stations, interpretive shelters, and the ruins of the Cataract Electric Company hydro generating plant, a legacy stone and concrete structure adjacent to the Credit River and former Brampton Railway corridor; qualifies as a vibration-sensitive receptor and potential cultural heritage resource under PPS 2024 Policy 2.6 and the Ontario Heritage Act Section 27.
- *Credit Valley Conservation (CVC) lands* – community gardens, tool sheds, and seasonal infrastructure.
- *TPC Toronto at Osprey Valley Golf Course (18821 Main Street)<sup>16</sup>* – nationally recognized golf and hospitality complex comprising three championship courses, overnight accommodation villas, four golf simulators, two licensed restaurants with seating capacity for approximately 130 patrons, and multiple hospitality outbuildings. The facility also hosts PGA TOUR events, including the RBC Canadian Open, with modular grandstand seating, outdoor kitchens, and event structures. These structures are slab-mounted, lightly framed, or modular and, therefore, structurally vulnerable to vibration amplification, anchoring fatigue, and displacement. Located within 100 metres of the proposed quarry boundary, the property qualifies as a vibration-sensitive public-use receptor under PPS 2024 Policy 2.4.4 and Caledon Official Plan Section 3.1 due to continuous public occupancy, tourism infrastructure, and its role as a regional cultural and economic asset.
- *Credit Valley Trail (Orangeville to Lake Ontario in Mississauga)* – within 300 metres of the proposed quarry boundary, former Brampton Railway corridor with trailhead kiosks, signage, and

<sup>14</sup> Alton Greenhouses & Garden Centre. (n.d.). *Alton Greenhouses & Garden Centre*. Retrieved November 28, 2025, from <https://altongreenhouses.ca/>

<sup>15</sup> Ontario Provincial Parks. (n.d.). *Forks of the Credit Provincial Park*. Retrieved November 28, 2025, from <https://ontarioprovincialparks.ca/park/forks-of-the-credit-provincial-park/>

<sup>16</sup> TPC Toronto at Osprey Valley. (2024). *Facilities and venues overview*. Retrieved November 29, 2025, from <https://www.ospreyvalley.com/>

legacy rail infrastructure, and active culvert and bridge upgrades, forms part of CVC's long-term ecological corridor and proposed parkland integration strategy<sup>17</sup>.

- *GoodLot Farmstead Brewing Co. (18825 Shaws Creek Road)*<sup>18</sup> – slab-mounted brewery outbuildings, beer garden shelters, and public-use facilities.
  - *Chickadee Hill Farm* – legacy agricultural outbuildings including barns, chicken coops, apiary sheds, tool and feed storage sheds, a slab-mounted farm-gate retail shelter, and a historic stone foundation qualifying as a potential cultural heritage resource.
  - *Esso Gas Bar Mixed-Use Commercial and Residential (1521 Charleston Sideroad SE corner Charleston Sideroad and Cataract Road/Main Street)* - comprising a slab-mounted fuel station with four dispenser pumps, a public-facing convenience store, and upper-level residential occupancy. Located at a rural hamlet intersection, within 20 metres of the lot limits of Votorantim Cimentos' (St Marys/CBM) application for a blasting quarry and processing plant, the site includes flammable inventory, buried tanks, pressurized systems, a commercial propane tank, and continuous public access. The convenience store, LCBO outlet, Beer Store, 26-seat licensed restaurant, and two-bay auto repair shop add retail foot traffic, glass shelving, and public queuing exposure. Its slab-on-grade construction, light framing, and multi-interface occupancy make it structurally and functionally vulnerable to cumulative vibration and overpressure impacts. There are also four U-Haul truck rentals. Qualifies as a vibration-sensitive public-use receptor under PPS 2024 Policy 2.4.4 and Caledon Official Plan Section 3.1 due to mixed-use zoning, receptor sensitivity, and role in supporting rural service infrastructure.
  - *The Liberty Inn – Heritage Hospitality and Arts Retreat (14938 Cataract Road, Hamlet of Cataract)*<sup>19</sup> – Constructed in 1855, this legacy stone and brick building is one of the oldest continuously occupied mixed-use structures in Ontario. Originally serving as Cataract's first post office and general store, it now operates as a Nordic spa and boutique retreat offering overnight accommodation, pottery workshops led by a professional ceramicist, and outdoor wellness programming including forest bathing, seasonal rituals, and private use of a woodland-set Nordic spa. The site includes a dug stone foundation, slab-on-grade additions, and vibration-sensitive pottery infrastructure such as kilns, wheels, and shelving. These features are structurally vulnerable to anchoring fatigue, thermal instability, and displacement. Located within 400 metres of the proposed blast zone, the property qualifies as a vibration-sensitive public-use receptor under PPS 2024 Policy 2.4.4 and Caledon Official Plan Section 3.1 due to its heritage construction, cultural programming, seasonal public occupancy, and role in supporting rural wellness and arts-based tourism. The structure and original civic function also trigger obligations under PPS 2024 Policy 2.6 and the Ontario Heritage Act Section 27 as a potential cultural heritage resource.
- These omissions compromise the integrity of receptor mapping and setback modelling required for compatibility analysis under PPS 2024 and the Caledon Official Plan, materially limiting the study's applicability to Caledon's rural planning context and fails to meet the compatibility and mitigation requirements of PPS 2024 Policy 2.4.4, which mandates that major facilities such as quarries be planned and buffered to prevent or mitigate adverse effects on sensitive land uses, and Caledon Official Plan, which requires site-specific compatibility studies and mitigation measures for mineral aggregate operations. In the case of Chickadee Hill Farm, additional obligations may arise under PPS 2024 Policy 2.6 and the Ontario Heritage Act Section 27, due to the presence of a historic stone foundation.

Moreover, this exclusion undermines the broader sustainability objectives outlined in Caledon Official Plan Section 3.1, which require development proposals to demonstrate how they contribute to long-term community health, ecological integrity, and rural resilience. Section 3.1 emphasizes precautionary planning and the protection of sensitive receptors — including built heritage and agricultural assets — as part of Caledon's integrated approach to environmental, economic, and social sustainability. The omission fails to account for these receptors and represents a material planning deficiency and increases the risk of unmitigated structural damage, ecological disruption, and civil liability.

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<sup>17</sup> Credit Valley Trail

<sup>18</sup> GoodLot Farmstead Brewing Co. (n.d.). *GoodLot Farmstead Brewing Co.* Retrieved November 28, 2025, from <https://www.goodlot.beer/>

<sup>19</sup> The Liberty Inn. (n.d.). *The Liberty Inn.* Retrieved November 28, 2025, from <https://www.thelibertyinn.ca/>

- *Failure to account for finished basements and damage concealment.* Finished basements conceal structural elements — such as foundation walls, floor slabs, and load-bearing joints — behind drywall, paneling, flooring, and ceiling treatments. This limits visibility and access during pre- and post-blast inspections, potentially masking vibration-induced cracking, separation, or fatigue. The absence of a standardized protocol for assessing finished spaces undermines the reliability of damage attribution and complicates post-event diagnostics, especially in jurisdictions where basement finishing is common and variable in quality. Moreover, vibration-induced fissures or joint separations may allow water ingress, particularly in areas with high water tables or seasonal runoff. In finished basements, this can lead to trapped moisture behind impermeable surfaces, fostering mold growth—including *Stachybotrys chartarum* (black mold)—which poses serious health risks and may require costly remediation (Shoemaker et al, 2025). These risks are amplified when basement finishing is completed without permits or moisture barriers, further obscuring liability and complicating insurance and public health responses. Sub-flooring systems (e.g., plywood, OSB, sleeper frames, or floating panels) installed over concrete slabs further obscure direct access to structural surfaces and introduce additional diagnostic blind spots. Vibration-induced damage may propagate beneath these systems undetected, especially when no vapor barrier is present. Sub-flooring also creates air gaps and impermeable layers that trap moisture from hydrostatic pressure or seasonal runoff, increasing the risk of anaerobic mold growth and microbial colonization. These risks are amplified when basement finishing is completed without permits, inspections, or moisture protection, further obscuring liability and complicating insurance and public health responses. Certain sub-flooring designs may also amplify vibration resonance, increasing perceptual discomfort and secondary damage to finishes. These factors must be explicitly considered in compatibility modelling, damage attribution protocols, and pre-blast survey frameworks.
- *No consideration of psychological or quality-of-life impacts.* The Siskind study did not account for perceptual or psychological effects, which were central to the Alvaton<sup>20</sup> denial and are increasingly recognized in receptor vulnerability modelling. It also lacked a damage attribution protocol, creating ambiguity in enforcement and undermining compensation mechanisms. Complaints, fear, disturbances, and other human reactions to vibration from construction work, especially blasting activities, are likely to occur at much lower vibration levels than those causing building damage. In Norway, vibration class limits for land-based transport under standard NS 8176 [10] are in the range of 0.1 mm/s to 0.6 mm/s. These thresholds are sometimes applied to quarry blasting and similar activities (Turunen-Rindel et al., 2017), reflecting a more precautionary approach to receptor sensitivity and perceptual comfort. NS 8141-1:2012+A2:2014 is a Norwegian standard that sets guideline limit values for vibration and airblast from construction, mining, and traffic. Amendment A2 was added to address human reactions, not just structural integrity — recognizing that perceptual impacts such as annoyance, fear or anxiety, and sleep disruption require distinct thresholds and land use planning consideration (Standard Norge, 2014). Human response to ground vibrations is addressed in the Siskind et al. 1980 report on page 4. On page 62 of the report, the authors indicate: “Responses of ‘slightly perceptible’ occurred at 0.010 in/sec [0.25 mm/sec] to 0.033 in/sec [0.84 mm/sec], and the threshold of ‘strongly perceptible’ is 0.10 in/sec [2.54 mm/sec].” The authors go on in the next paragraph to define “strongly perceptible” as “unpleasant”. These thresholds and perceptual quality of life criteria must inform land use compatibility modelling under PPS 2024 Policy 2.4.4 and Caledon Official Plan Section 3.1, especially where receptors include heritage assets, seasonal dwellings, and public-use infrastructure.
- *No evaluation of cumulative or long-term vibration exposure.* The 1980 study (RI 8507) focused on discrete blast events and did not assess the effects of repeated low-level vibration over time,

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<sup>20</sup> On October 23, 2018, the Meriwether County Board of Commissioners (CBC) denied the request to rezone the property and grant a special use permit for a blasting quarry. The appeal of the CBC ruling to deny the rezoning was upheld by the Superior Court in *Luther H. Randall, III, et al., v. Meriwether County, Georgia, et al.* File No. 18CV0270 [May 1, 2019]. In upholding the decision of the Board of Commissioners, the Superior Court made a number of observations as to the significant potential adverse impacts, including the following: “(e) blasting at the quarry has a high likelihood of damaging many of the more than 100 residential structures within one to two miles [1.609 to 3.219 kilometres] of the proposed granite pits over the life of the proposed operation and will significantly degrade the quality of life for those residents affected; [p. 9-11].” [https://flinriverkeeper.org/wp-content/uploads/2019/05/Randall\\_etal\\_v\\_Meriwether\\_County\\_etal\\_Final\\_Order.pdf](https://flinriverkeeper.org/wp-content/uploads/2019/05/Randall_etal_v_Meriwether_County_etal_Final_Order.pdf).

which can lead to progressive fatigue, microfracturing, seal degradation, and settlement shifts in both structural and mechanical systems. These impacts often manifest gradually, beyond the scope of short-term observation windows, and are especially relevant in rural and semi-rural zones where receptor redundancy is limited and structural resilience varies. Long-term vibration exposure can compromise foundation integrity, joint stability, and mechanical alignment, particularly in buildings with unreinforced masonry, riveted steel, or aging HVAC and plumbing systems. Compatibility studies that ignore cumulative exposure risk underestimating non-visible damage, misrepresenting receptor vulnerability, and violating planning instruments such as PPS 2024 Section 1.2.6.1, which require permanent protection of sensitive land uses and infrastructure. A modernized framework must incorporate high-cycle fatigue modelling, frequency-specific calibration, and longitudinal monitoring to ensure compatibility with both human and non-human receptors over time. These cumulative effects must be modelled and disclosed as part of any compatibility assessment, with monitoring protocols designed to detect sub-damage thresholds and progressive degradation over time. As noted in *Chase Limited Partnership*, Case No. BA 95-58E, May 13, 2024 (Standard Norge, 2014):<sup>21</sup>

Petitioner claims that it is scientifically impossible for Chase Land to have caused the damages alleged by homeowners. This is plainly false, as that fact has not been proven either by the scientific community or in this case. The petitioner has not produced a single study scientifically examining the long-term and cumulative effects of over 20 years of blasting on two-story residential structures. The petitioner's own expert, Mr. Rudenko, was not aware of any studies conducted over the past 20 years to determine the cumulative effects of blasting. In support of Petitioner's theory that it is not in violation of Condition 13, Petitioner's witnesses cite a 1984 U.S. Bureau of Mines study that attempts to model what nearby homes might look like after 20+ years of blasting at a coal mine. The study was conducted for only 2 years, and not 20 years. The Opposition's homes have been the recipients of the blasts and vibrations (Stagg et al., 1984). Petitioner's witness cites Galileo's formula for the acceleration to bolster their argument that their extremely old data is scientifically sound. By Petitioner's logic, smoking does not cause lung cancer because there was no scientific proof of that in the early 1600s. Old science is not always good science.

- *Exclusion of indoor mechanical, environmental, and occupancy-related systems.* The 1980 study (*RI 8507*) did not evaluate vibration impacts on HVAC systems, water heaters, sump pumps, electrical panels, or ductwork — nor did it account for appliances, mounted fixtures, or sensor-based systems such as thermostats, alarms, and automated controls. These components are vulnerable to vibration-induced alignment shifts, joint fatigue, seal degradation, and operational disruption — even in the absence of visible structural damage. The 1984 study (*RI 8896*) involved a single unoccupied, raised wood-frame bungalow with an unfinished concrete block basement, equipped with electricity and heating/cooling systems but lacking plumbing and interior finish work such as doors, cabinetry, and furnishings. The absence of these occupancy-related systems and loads eliminated key vibration transmission pathways and resonance amplifiers found in real-world residential or mixed-use receptors. These exclusions further limit the diagnostic relevance of both studies for licensing decisions involving occupied, mechanically integrated, or receptor-diverse environments.

Moreover, the foundational studies by David Siskind have been repeatedly criticized and dismissed by explosives experts and courts. FOIA correspondence reveals that a senior Vibra-Tech official—representing a leading blasting technology firm—warned:

“Any criteria...which ignores the frequency of a structure and the frequency content of the ground motion is overly simplistic...Your criteria, as proposed, will neither protect the interests of the citizen and the homeowner nor will it protect the blaster from alleged damage claims.

After the Bureau of Mines was defunded in 1995 by Congress, Siskind became a private consultant and testified for the coal company that lost the Bim case, a landmark decision that overturned his vibration limits. As Siskind himself admitted in a 1997 letter to an OSM (Office of Surface Mining Reclamation and Enforcement) official:

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<sup>21</sup> Howard County Board of Appeals Hearing Examiner. (2024). *Decision and Order in the Matter of Chase Land, LLC f/k/a Chase Limited Partnership*, Case No. BA 95-58E. Issued May 13, 2024. Retrieved from: <https://baltimorepostexaminer.com/wp-content/uploads/2024/06/BA-95-058-DO.pdf>

“Complainants are trying to dismiss all the science as biased, wrong, or non-applicable. For the most part, they are succeeding in ways that pay off (Loeb, 2000).”

These admissions and legal outcomes further undermine the credibility of RI 8507 and RI 8896 as reliable diagnostic tools for receptor compatibility in Ontario quarry licensing, particularly in occupied and furnished, mechanically integrated, or receptor-diverse environments where vibration impacts extend beyond visible structural damage.

- *No assessment of accessibility features or mobility aids.* Vibration-induced misalignment of ramps, lifts, grab bars, or door thresholds can pose safety risks, particularly in homes with aging residents or accessibility retrofits. These features are often installed in older structures with variable anchoring conditions and may be sensitive to micro-movements or wall flexure. As of mid-2024, approximately 11,446 Caledon residents are aged 65 and over—representing about 12.6% of the town’s population. Their presence reinforces the need for compatibility analysis that includes accessibility infrastructure and receptor-specific calibration. Age-friendly planning is addressed in the PPS (2024) under Section 2.1.1(d), which calls for land use patterns that support aging in place and barrier-free access.
- *No evaluation of indoor air quality or dust migration.* The study did not assess how vibration may dislodge settled dust, degraded insulation fibers, or aged building materials such as plaster, lead paint, or asbestos-containing compounds. These particulates can become airborne and circulate through HVAC systems, especially in finished basements or older homes with limited ventilation. This can degrade indoor air quality, trigger respiratory irritation, and compromise filtration systems. In Ontario’s rural and semi-rural settlement areas—where basement finishing is common, and ventilation varies—these risks are amplified. The absence of indoor air quality modelling or dust mitigation protocols undermines compatibility analysis under Ontario’s planning frameworks, particularly where receptor vulnerability includes children, seniors, or individuals with respiratory sensitivities.
- *No consideration of insurance, disclosure, or real estate impacts.* Even “cosmetic” damage can trigger insurance claims, affect resale value, or require disclosure under real estate regulations. The absence of a standardized damage attribution protocol complicates these processes and disadvantages property owners and tenants. For landlords, vibration-related damage may affect unit turnover, rental income, and insurability, while tenants may experience disruption, loss of quiet enjoyment, or damage to personal property not covered under standard renter’s insurance. Moreover, vibration can damage contents such as artwork, framed photographs, sentimental keepsakes, ceramics, and electronics—items sensitive to micro-movements, wall flexure, or particulate migration. These losses are not addressed in structural assessments, yet they carry significant financial and emotional value. They are typically excluded from standard homeowner and renter policies without specific riders, leaving both landlords and tenants exposed. Their vulnerability reinforces the need for receptor-specific calibration under Ontario’s Planning framework and land use compatibility study requirements, as outlined in Section 1.2.6.1 of the Provincial Policy Statement, 2024 and the Real Estate Council of Ontario’s Material Fact Disclosure bulletin, which requires registrants to disclose any known condition that could reasonably affect a buyer’s or tenant’s decision (RECO, 2023).
- *No assessment of vibration impacts on animals or livestock.* These disturbances can cause behavioural changes, physiological stress, and disruption to pets, livestock, and wildlife—receptors that are especially relevant in rural, rural settlement, agricultural, and conservation contexts. As Reynolds et al. (2020, p. 159) note, “Sound and vibration have been shown to alter animal behavior and induce physiological changes as well as to cause effects at the cellular and molecular level”. Sevelka (2023) further documents cumulative stress responses in domestic and wild animals near quarry operations, reinforcing the need for non-human receptor calibration. This is particularly significant given that almost 80% of Canadian households own at least one pet, with ownership rates even higher in rural and semi-rural areas due to larger property sizes, agricultural uses, and cultural norms around animal companionship and utility (Made in CA, 2025). While Caledon’s Animal Care and Control By-law No. 2019-43 (Town of Caledon, 2019) regulates the treatment and control of animals within the municipality, compatibility studies rarely incorporate vibration-related welfare risks. This omission undermines ecological planning principles and municipal animal protection standards, particularly in zones permitting kennels, livestock operations, or

adjacent to Environmental Policy Areas. Receptor-specific calibration is required under Ontario’s Planning framework to ensure compatibility with both human and non-human receptors.

- *No evaluation of telecommunications or digital infrastructure.* Sensitive equipment such as routers, servers, smart devices, and antennae may be disrupted by vibration, particularly in areas with limited redundancy or aging infrastructure. This is increasingly relevant in rural and semi-rural communities where remote work, digital education, and telehealth services depend on stable connectivity. According to Innovation, Science and Economic Development Canada’s *Connectivity Strategy*, internet access is no longer a luxury but a critical utility for economic participation, education, and healthcare delivery (Innovation, Science and Economic Development Canada, 2025; Office of the Auditor General of Canada, 2023). Vibration can interfere with signal transmission, destabilize mounted hardware, and degrade performance in systems reliant on precise calibration or uninterrupted power. These risks are rarely addressed in compatibility studies, despite the growing reliance on fixed wireless, satellite, and antenna-based systems in rural and semi-rural Ontario. Their omission undermines digital equity goals and exposes receptors to service disruption, data loss, and equipment failure—especially in zones with limited broadband redundancy or emergency response infrastructure.
- *No evaluation of sensitive non-residential uses.* The study did not evaluate vibration impacts on non-residential uses such as those permitted “as-of-right” under Caledon’s Zoning By-law No. 2006-50 (Town of Caledon, 2023) or as small-scale uses, subject to a Development Permit, in Minor Urban Centres under the Niagara Escarpment Plan, such as medical diagnostic equipment, 3D printing, art galleries/studios, yoga studios, message therapy, hair salons and barber shops, fitness instruction, daycare centres, pet grooming (non-kennel), recording studios, computer repair, jewelry making, photography, and tutoring. These uses, categorically summarized in the matrix below, are increasingly present in rural and semi-rural settlement areas and may be highly susceptible to vibration-induced disruption, even below structural damage thresholds.

Table 2: Vibration-Sensitive Uses Matrix – Caledon & NEP Minor Urban Centres

<i>Use Type</i>	<i>Examples</i>	<i>Caledon Zoning (As-of-Right)</i>	<i>NEP Centres (Permit Required)</i>	<i>Sensitivity</i>	<i>Diagnostic Challenges</i>
Health & Wellness	Massage, physio, counselling, speech therapy	Permitted	Permitted	High – client comfort	Concealed damage, perceptual effects
Creative & Instructional	Art, music, yoga, tutoring, photography	Permitted	Permitted	Moderate – High - focus	Subjective impacts, misalignment
Personal Services	Hair, esthetics, pet, grooming, tattooing	Permitted	Permitted	Moderate – tools, safety	Equipment fatigue, client discomfort
Tech & Precision Work	3D printing, electronics, jewelry making	Permitted	Permitted	High - calibration	Microfractures, miscalibration
Education & Online	Virtual teaching, test prep, tutoring	Permitted	Permitted	Moderate – AV quality	Tech interference, focus disruption
Small-Scale Production	Baking, tailoring, crafts, and antiques retail	Permitted	Permitted	Moderate - inventory	Cracking, dust, display damage

Audio/Recording	Studios, podcasting, mastering	Permitted	Permitted	High-acoustic fidelity	Audio distortion, equipment drift
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These uses in table 2 are protected under Ontario’s planning frameworks and must be considered in land use compatibility assessments under the *Planning Act*, *PPS (2024)*, and *Niagara Escarpment Plan*. Their exclusion from RI 8507 and Golder’s assessment undermines diagnostic completeness and planning integrity.

## 7. BLASTING PEAK PARTICLE VELOCITY (PPV) LIMITS IN OTHER JURISDICTIONS

In recognition of the fact that damage to dwellings can occur at low ground vibration levels, other countries have set much more stringent limits on allowable peak ground vibrations. Table 2 below shows that regulatory agencies in Leicestershire County, UK have established the upper limit on allowable peak particle velocity as 0.24 in/sec (6.096 mm/sec); in Australia the common limit is 0.2 in/sec (5.08 mm/sec) and it is 0.001 in/sec (0.00254 mm/sec) for historical buildings and monuments for frequencies less than 15 Hz (Australian and New Zealand Environmental Council, 1990)<sup>22,23</sup>. These have been described in table 3 below.

Table 3: Typical blasting limits by country (source: Roy, 2005)

<i>Measure</i>	<i>Units</i>	<i>Comments</i>
Human perception	0.15 – 1.5 mm/s	
Visible damage	50 mm/s	Values in excess cause appreciable structural damage
British Standard BS 64722.1922	8.5 – 12.7 mm/s	90 % confidence limit – permissible impulsive vibration at residential property
Leicestershire County Council (UK)	6 mm/s	90 % confidence level – part of the conditions covering blasting within modern planning permissions
Australian Standard Explosive Code AS2187-1993	5 mm/s	Common environmental limit (EPA) – depends on the administering authority
(AS2187.2-2006)	0.2 mm/s	Historical buildings and monuments – displacement for frequencies less than 15 Hz
	19 mm/s	Houses and low-rise residential buildings – resultant PPV for frequencies greater than 15 Hz
	25 mm/s	Commercial limit AS 2187.3
India	5 mm/s	Domestic house/structures – frequencies less than 8 Hz
German Standard DIN 4150 (GIS, 1986)	5 mm/s	Domestic house/structures – frequencies less than 10 Hz
	5 -15 mm/s	Domestic house/structures – frequencies 20 to 40 Hz
	15 – 20 mm/s	Domestic house/structures – frequencies 50 to 100 Hz
Hungarian Standard	5 mm/s	Panel houses
Swiss Standard	8 – 12 mm/s	Objects of historic interest or other sensitive structures – frequency bandwidth: 60 – 90 Hz
Swedish Standard National Museums	12 mm/s	Building structure
	5 mm/s	Sensitive exhibits

<sup>22</sup> Miller Paving Limited’s (Miller) quarry located in the Municipality of McNab/Braeside, Ontario: Dr. Kiger’s Expert Report prepared January 12, 2015.

<sup>23</sup> Table 2 from R. Pesch and A. Robertson, “Drilling and Blasting for Underground Space”, Wollongong, NSW, 3 – 4, September 2007 at p. 190. Drilling and Blasting for Underground Space – 20070925041722.s

## 8. CONCLUSION

RI 8507 remains a historically significant study, but its lack of methodological rigour, lack of receptor diversity, and lack of temporal granularity render it inadequate as a universal standard for vibration impact assessment. Its continued use in the United States and other jurisdictions, including Ontario quarry proposals — without receptor-specific calibration — risks misrepresentation of environmental impacts and undermines public trust, legal defensibility, and planning integrity. A modernized framework must incorporate structural diversity, perceptual sensitivity, frequency-specific modelling, and environmental context. This includes recognition of mechanical system vulnerability to resonance effects, persistent, perpetual discomfort, and emotional distress at sub-damage vibration levels, and ecological receptor sensitivity. These considerations must be aligned with Ontario's planning instruments and ecological realities, and internationally recognized standards such as NS 8141-1 + A2 and NS 8178 (Norway).

To operationalize permanent land use compatibility and enforce perimeter-based monitoring, all receptors within a minimum baseline 2,000-metre radius of the boundary limits of Votorantim Cimentos' (St Marys/CBM) application for a blasting quarry and processing plant, and abutting ownership or potential control must be identified, classified, and mapped using current parcel data. This inventory must include a complete physical description, including land use controls and land use overlays for each parcel. This includes occupied dwellings, institutional buildings, but also mechanically integrated structures, telecommunication infrastructure, ecological receptors, and receptor clusters with cumulative vulnerability. Receptor-specific calibration must account for structural type, occupancy status, mechanical load, and environmental sensitivity—particularly in rural and semi-rural zones where redundancy is limited and receptor diversity is high. Without a complete receptor inventory, compatibility studies risk underestimating and overlooking offsite impacts, violating planning instruments such as PPS 2024 Section 1.2.6.1, and failing to uphold the public interest in land use integrity, environmental protection, and infrastructure resilience. The overarching objective remains the protection of public health, safety, and welfare through receptor-specific calibration and perimeter-based monitoring. This receptor inventory must be publicly disclosed and independently verified before any potential planning approval or licence issuance, ensuring transparency, defensibility, and alignment with statutory obligations under the Planning Act, Aggregate Resources Act, and Environmental Assessment Act.

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## APPENDIX-A

### Vibration Damage Case Studies – Structural Impact, Emotional Distress, and Legal Precedent

This appendix presents documented case studies and technical findings illustrating the real-world consequences of quarry blasting on nearby communities, structures, and individuals. These examples are included to support receptor mapping, setback modelling, and land use compatibility analysis under PPS 2024 and the Caledon Official Plan. The selected cases demonstrate that vibration-related impacts are not limited to ground motion alone. Acoustic overpressure (concussion) generated by blasting can exceed ground vibration in both structural significance and human sensitivity. Research by Taylor (1975) and Siskind et al. (1980) confirms that sonic boom criteria—originally developed for aerospace applications—are applicable to quarry blasts, particularly in rural and semi-rural contexts where legacy construction and slab-mounted infrastructure are prevalent.

Legal precedents such as *Alonso v. Hills et al.* (1950) further establish that cumulative blasting impacts—including flyrock, structural damage, and emotional distress—can give rise to compensable nuisance and injunctive relief. These cases also affirm that inferential and circumstantial evidence of damage may outweigh direct expert testimony, reinforcing the importance of community-based observations and visible injury documentation. Together, these studies and rulings underscore the need for precautionary planning, receptor sensitivity analysis, and mitigation measures tailored to the structural and social realities of rural and semi-rural Ontario. They provide probative support for the inclusion of vibration-sensitive receptors in compatibility studies and reinforce the statutory obligations under PPS 2024 Policy 2.4.4, Policy 2.6, and the Ontario Heritage Act.

According to A. G. Taylor (1975), the acoustic wave (concussion) generated by quarry blasting can be of greater significance than ground vibration induced by the same blast. Both Taylor (1975) and Siskind, et al. (1980) agree that sonic boom research can be applied to quarry blasts:<sup>24</sup>

*Quarry blasts were monitored during 1973--1974 at several locations in Southern Ontario to determine if the acoustic wave (concussion) was likely to be of significance from the points of view of structural damage and human annoyance. The monitoring instrumentation used included sonic boom microphone-- carrier system and FM tape recorder. The characteristics of the blast wave, overpressure, spectrum, and duration were analyzed using a storage oscilloscope and real-time analyzer and were compared with the characteristics of sonic booms. The two phenomena were shown to be similar in spectral content to most energy in the infrasonic region; the overpressure at several thousand feet from a blast can be similar to that of a sonic boom, whereas the duration of the pressure perturbation is several times longer for a blast than for a sonic boom. It is concluded that damage and annoyance criteria developed from sonic boom research may reasonably be applied to quarry blasts. It was also found that in many instances the acoustic wave can be of greater significance than ground vibration induced by the same blast.*

The following case studies illustrate the range of structural, perceptual, and legal consequences associated with quarry blasting in rural and semi-rural contexts.

#### Blast Vibration Damage 1

In *Alonso v. Hills et al.*, (1950),<sup>25</sup> as a consequence of recurrent quarry blasting operations, the California appeal court upheld the trial court's damages award of \$2,650, consisting of \$1,650 for damage to and depreciation of the property, and \$1,000 for the plaintiff's distress in body and discomfort, annoyance, fright and shock. According to the homeowner, the residence is located in Rockaway Beach, a community of 300 homes and 200 yards (183 metres) distant from the quarry. The evidence that there were 85 homes and the distance was 300 yards (274 metres) from the quarry had no bearing on the outcome of the case.

Blasting conducted at the quarry on November 2, 1946, February 3, 1947, and on many occasions before and after caused violent concussions in the nature of earthquake thereby injuring plaintiff's real

<sup>24</sup> Taylor, A.G., "Quarry blast acoustic wave (concussion) – response of structures and human annoyance," *Ontario Ministry of the Environment*, Toronto, *JASA*, <https://asa.scitation.org/doi/pdf/10.1121/1.1995087>.

<sup>25</sup> *Alonso v. Hills*, 95 Cal.App.2d 778 (1950) 214 P.2d 50, [https://scholar.google.ca/scholar\\_case?case=4442811314394772785&q=Alonso+v.+Hills&hl=en&as\\_sdt=2006](https://scholar.google.ca/scholar_case?case=4442811314394772785&q=Alonso+v.+Hills&hl=en&as_sdt=2006).

property and building, and disturbed the enjoyment of the dwelling by plaintiff and his family, shocked plaintiff's nerves and injured his health, and caused his children great fear. The February 3, 1947 quarry blast launched a 3-pound rock (flyrock) that destroyed a bench on the property near which one of the plaintiff's daughters was standing, causing the plaintiff to lose sleep and fear for his security and that of his family.

*[2] The recurrent blasting in the operation of defendant's quarry, causing cumulative injury to plaintiff's property and interference with its enjoyment and requiring injunctive relief could conceivably be considered as one line of conduct in the character of a nuisance giving rise to one cause of action, without necessity of separate statement of separate blastings.*

On the issue of the relevance of expert evidence argued by the quarry owner, the appeal court ruled that expert testimony was not entitled to preference over testimony as to facts, and that inferential evidence can overcome direct evidence:

*...[R]egular scientific expert testimony is not entitled to preference over testimony as to facts; the relative weight must be decided by the trier of facts. (Rolland v. Porterfield, 183 Cal. 466,469 [191 P. 913].)*

*[8] The finding that on November 2, 1946 [before the blast], plaintiff's property was of the reasonable value of \$5,000 finds competent support in plaintiff's testimony that he figures the valuation of his house at that time in the neighborhood of \$5,500. (Isenberg v. Sherman, 212 Cal. 454, 483 [298 P. 1004, 299 P. 528], 10 Cal.Jur. 1023.) Appellant's attack on plaintiff's evidence on the ground of contradictions in his statements as to his cost price go to the weight of this evidence only, of which the trier of facts is the sole judge.*

*[9] It is true that there was no direct evidence as to structural weakening. However, plaintiff testified that after the November 2 blast there were cracks all through the exterior of the house, the stucco outside was buckled, the window sills and frames all knocked out of proportion, the plumbing leaking, barbecue pit and terrace ruined. From such evidence of visible injury an inference can be drawn that also the general structural strength of the building must have suffered. Whether the inference should be drawn in this case was again for the trier of facts. (Blank v. Coffin, 20 Cal. 2d 457, 461 [126 P.2d 868]; 10 Cal.Jur. 738,739.) Such inferential evidence can also overcome direct evidence to the contrary. "[I]t is elementary that direct evidence may be disbelieved and contrary circumstantial evidence relied upon to support a verdict or finding." (Gray v. Southern Pacific Co., 23 Cal. 2d 632,641 [145 P.2d 561].)*

## **Blast Vibration Damage 2**

In *Davis v. L & W Construction Company*, (1970), *air concussions* and *ground vibrations* from blasting at a quarry about six-eighths of a mile (1,207 metres) away damaged the Davis residence. Their two-storey residence, measuring 32' × 32', is a stucco covered and hollow tile structure, with basement, and was in "good solid condition prior to the blasting" by the quarry operator. When quarrying operations were in progress, which had worsened by 1966, the Davis' house shock, a window broke, and structural cracks began to appear. An experienced building contractor testified on behalf of the homeowners, stating that one time while in the home the building was in good condition, and that during a second visit he found cracks, "both diagonal and vertical." He concluded,

*[V]ertical or horizontal cracks cannot result from settling and are usually caused by jar, shaking or possibly wind.*

Neighbours Albert Poli and John Head also testified as to the damages each sustained to their home as a consequence of the blasting quarry operations.

*Albert Poli stated he lives about three-fourths mile [1,207 metres] west of the quarry, in a 24' × 48' frame house with cement block basement. The structure had never settled, but the foundation is shaken and cracking all over.*

*John Head testified he resides approximately 70 rods [352 metres] southeast of plaintiffs [Davises], or about one and a fourth miles [2,012 metres] from the quarry. He had seen cracking and hairline cracks in the Davis home. His more remote residence trembled whenever there was blasting at defendant's quarry, and every room reveals damage to plaster and paper.*

The Iowa Supreme Court ruled in favour of the Davises and awarded damages, measured as the loss in market value, based on a before-and-after-blasting analysis, while holding the quarry operator "liable without fault" for engaging in a notoriously hazardous activity.

*Surely it is a matter of common knowledge, and we accord judicial notice to the fact, that blasting by use of dynamite or other explosives is a hazardous activity and as such likely to damage others. See Boyce v. United States, D.C., 93 F.Supp. 866, 868; 31 C.J.S. Evidence § 9, page \*226 824; and 29 Am.Jur.2d, Evidence, section 23, page 60.*

*Since 1916 we have consistently adhered to that concept sometimes previously referred to as strict liability, but in cases of the nature here involved, now more appropriately termed "liability without fault". See Lubin v. City of Iowa City, 257 Iowa 383, 131 N.W.2d 765; Monroe v. Razor Construction Co., 252 Iowa 1249, 110 N.W.2d 250; Pumphrey v. J. A. Jones Construction Co., 250 Iowa 559, 94 N.W.2d 737; and Watson v. Mississippi River Power Co., 174 Iowa 23, 156 N.W. 188. Also Annos. 20 A.L.R.2d 1372, 1375.*

*...[I]f one engages in an activity on his own land of such hazardous nature as to involve risk of harm to the person, land or chattels of neighboring parties, he is liable for the consequences proximately resulting therefrom without regard to degree of care, scientific manner in which done, purpose or motive. Watson v. Mississippi River Power Co., supra, at 174 Iowa 29-31, 156 N.W. 188; Davis v. Georgia-Pacific Corporation, Or., 445 P.2d 481; Harper and James on the Law of Torts, section 14.6, page 815; and Restatement, Torts, section 520.*

*And, as stated in Monroe v. Razor Construction Co., supra, loc. cit., 252 Iowa 1252, 110 N.W.2d 252: "Under this rule, negligence of the defendant need not be shown as an essential element of plaintiffs' recovery." See also Cronk v. Iowa Power & Light Co., 258 Iowa 603, 613, 138 N.W.2d 843.*

*Consequently the user of explosives acts at his own peril and is liable if damage proximately results to another, either from the direct impact of debris thrown by the blasting, or from consequential concussions or vibrations. In addition to authorities cited, supra, see Exner v. Sherman Power Const. Co., (2 Cir.) 54 F.2d 510, 512-513; Garden of the Gods Village v. Hellman, 133 Colo. 286, 294 P.2d 597, 600-601; Morse v. Hendry Corporation, Fla.App., 200 So.2d 816, 817; Berg v. Reaction Motors Div., 37 N.J. 396, 181 A.2d 487, 492-494; Davis v. Georgia-Pacific Corporation, supra, loc. cit., 445 P.2d 483; Bedell v. Goulter, 199 Or. 344, 261 P.2d 842, 845-846; and Annos. 20 A.L.R.2d 1372, 1377.*

### Blast Vibration Damage 3

From January 2007 through January 30, 2009, 104 complaints were filed against White Rock Mining in connection with noise and property damage from ground vibration caused by blasting quarry operations in South Florida, for which the quarry owner denied responsibility.<sup>26</sup>

*In every case, the fire marshal visited the homes, took pictures of the damages, and interviewed the homeowners. Some described the noise as "very loud and frightening," and others said the house shook like an earthquake, with vibrations causing pictures to fall off the wall and dishes in the cabinets shaking.*

*The fire marshal inspector then verified the blasting schedules at the different blasting sites and found they had not exceeded the requirements established by Florida law.*

*In every case the result was "no violation...."*

*That White Rock is responsible for the blasting damage is further emphasized by the fact that when the blasting stopped, so did the claims for property damage.*

A May 13, 2021, news release and broadcast by 7 News Miami<sup>27</sup> describes and shows the damage sustained by properties of homeowners in proximity to the White Rock quarry, with the quarry operator, as expected, denying being responsible for the damages caused by vibrations from repeated blasting.

*White Rock Quarries is the closest to many of the homes and businesses feeling the vibrations.*

*The company tells us "the data from multiple independent studies ... is very clear: blasting within existing limits (which are among the strictest in the nation) does not damage homes."*

*And...*

<sup>26</sup> Quarry blasting will cause severe damage - Shelby County Reporter | Shelby County Reporter, February 10, 2010.

<sup>27</sup> Ozebek, Kevin. "Shaking Mad: South Florida residents believe blasting from nearby quarries causes damage to their properties, 7 News Miami, May 13, 2021. <https://wsvn.com/news/special-reports/shaking-mad-south-florida-residents-believe-blasting-from-nearby-quarries-causes-damage-to-their-homes/>.

*“Our blast vibrations are not stronger, but due to increasing residential encroachment and people spending more time at home due to COVID-19, the perception of our blasting may be heightened more than previous years.”*

*But, these businesses and homeowners are convinced it is the blasting behind these cracks.... At first, they feel a rumble. Then, they worry if their homes are damaged. Many residents in part of South Florida are shaking mad from blasting at nearby quarries....*

*Jeffrey Batic, homeowner: “Sometimes it can even knock you off your feet if you’re not careful. It is strong, and it has only gotten stronger.”...*

*Jeffrey Batic: “This crack towards the foundation continues all around the entire home.”*

*And they are not the only ones having this feeling.*

*Idel Llavore: “Please somebody help.”*

*Idel Llavore says she has spent tens of thousands of dollars fixing cracks on her home and property.*

*Last year, she fixed these deep cracks around her pool.*

*In some of her new tiles, she’s already finding new cracks.*

*Idel Llavore, homeowner: “I am driving my husband crazy because I have a panic attack. Every time I feel a blast, I start screaming.”*

*Miguel Martinez is also seeing cracks on the concrete floors of his occupational therapy clinic.*

*Miguel Martinez, business owner: “One day when a blast hits and dead silence breaks in the room, we watch this crack start emanating right after the blast goes through.”*

*Homeowners in some neighborhoods in Northwest Miami-Dade and Miami Lakes have put up with the blasting at nearby quarries for years, but Miami Lakes Mayor Manny Cid says the complaints are escalating.*

*Miami Lakes Mayor Manny Cid: “It has progressively gotten worse. The intensity has definitely gone up.”...*

#### **Blast Vibration Damage 4**

On June 25, 2007, the Town of Niagara, New York, served LaFarge with an injunction ordering it to “cease and desist operations” detrimental to residents of the nearby Tuscarora Village mobile home community.<sup>28</sup>

*The order claims the quarry has violated town law by creating dust and other safety hazards harmful to nearby residents. In addition, the noise and vibrations from the blasting have hurt residents’ quality of life and damaged portions of their homes, the order said.*

According to Tuscarora Village residents, vibrations from the blastings have damaged a large percentage of their homes, including some that are severely damaged. For the past several months, Ruth and her neighbors have complained effects from the blasts have damaged their manufactured homes and presented health hazards. After a series of discussions and environmental testing, the quarry was ordered by the town in June [2007] to cease and desist the rock blastings. Tuscarora Village is located within 100 yards of the quarry’s east end. The company has plans to blast on that side through October [2007] before moving to the other side. Residents don’t think their homes can sustain blastings for that long. They’ve hired the law firm of Magavern, Magavern and Grimm to represent them in the ongoing dispute against not only LaFarge, but also the owners of Tuscarora Village for allegedly not being upfront about the potential hazards. Attorney Richard Grimm said the firm represents a number of the village’s residents and is still investigating whether a lawsuit is appropriate.<sup>29</sup>

*A resident of Tuscarora Village suffered a concussion and a lower back sprain Friday after falling in the shower while the quarry was blasting. She was treated at Mount St. Mary’s Hospital and is now recovering at home.*

Effects from the latest blasting at LaFarge quarry has led to the injury of a 51-year-old Tuscarora Village resident, according to a police report Friday. Town of Niagara police responded to 4253 Mohawk Place for a woman who fell and struck her head while she was in the shower, Police Chief James Suitor said. The victim told police she fell while her home was shaking from the nearby blast at the quarry.

<sup>28</sup> Forgione, Rick. “Town of Niagara: Town halts quarry blasts,” *Niagara Gazette*, Jun 25, 2007, [https://www.niagara-gazette.com/news/local\\_news/town-of-niagara-town-halts-quarry-blasts/article\\_c2fa654c-44f7-5e67-86a6-674269df72e4.html](https://www.niagara-gazette.com/news/local_news/town-of-niagara-town-halts-quarry-blasts/article_c2fa654c-44f7-5e67-86a6-674269df72e4.html).

<sup>29</sup> Forgione, Rick. “TOWN OF NIAGARA: LaFarge meets with neighbors,” *Niagara Gazette*, July 25, 2007, TOWN OF NIAGARA: LaFarge meets with neighbors | Local News | [niagara-gazette.com](http://niagara-gazette.com).

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*[Town Supervisor] Richards was on site during that blast and immediately contacted Town Attorney Michael Risman to research possible action against LaFarge to halt future blastings....*

*Tuscarora Village residents realized something was different at the quarry almost immediately Monday when everything was silent as they walked outside, said Sharon Ruth, who is among the residents who have opposed the blastings.*

A recent promise from the LaFarge quarry that the severity of on-site rock blasting would be reduced and no longer cause damage to mobile homes in Tuscarora Village had resident Sharon Ruth feeling hopeful. Until her fish tank exploded on Monday [June 18, 2007]. “That was the biggest rumples I’ve experienced in two years,” Ruth said about the most recent blast at the quarry, which sits about 300 feet away from Tuscarora Village in the town of Niagara. The end result was an exploding fish tank that broke into pieces on top of her cat, adding to the estimated \$67,000 in damages she says her home has sustained in the past two years due to the blastings.<sup>31</sup>

*“We’re glad that steps are being taken, but they’re only temporary steps,” she said, adding that residents still ask for what they’ve wanted all along. “We don’t want to get hurt, we don’t want to get sick and we don’t want our houses caving in.”*

*Bill Poole, general manager of the quarry, could not be reached for comment Monday afternoon [June 25, 2007]. He said Friday the quarry has taken steps to reduce the level of blasting, despite being within legal limits according to federal regulations.*

In September 2007, sixteen (16) residents of Tuscarora Village sued LaFarge for damage to their homes caused by vibrations from blasting at the Quarry and the companies that own Tuscarora Village for failing to reveal that blasting would occur nearby. A prior June 22, 2007, article<sup>32</sup> written by the same journalist, reported an injury suffered by a resident in Tuscarora Village from a blast at the nearby LaFarge Quarry.

*Residents of Tuscarora Village, which sits about 100 yards from the quarry, have been complaining for months the effects from the blastings rock the mobile home park and have caused thousands of dollars in damages.*

*Friday’s incident was the first reported human injury the blasting has been accused of causing. “I kept saying ‘is it going to take someone getting hurt?’ before something is done about this,” said Tuscarora Village resident Sharon Ruth. “What happened out here was shocking.”*

*After residents took their concerns to the town board last month, a meeting was set up with LaFarge officials, who agreed to lower the blasting levels despite the company being within the federal regulations. However, in the three jobs [blasts] since, both residents and town officials believe that hasn’t happened.*

*“It felt like someone dropped a bomb over here today,” Ruth said Friday. We had more damage today than we’ve ever had.”*

*LaFarge General Manager Bill Poole told the Niagara Gazette Friday afternoon he had not heard about the injured resident. “That’s horrible, I’m sorry to hear that,” Poole said.*

*Poole contests the quarry has made “substantial” changes to reduce the effects from the blast. According to their readings, the blasts have gone down in velocity in each of the last three jobs [blasts], and are functioning at one-twentieth of what is allowed.*

*“We have made a commitment to try and reduce the shocks, even though we were operating within our permit limits,” Poole said, adding the reductions are costing the quarry money.*

*Federal guidelines set the maximum level at 2.0. Poole said the blast on June 3 [2007] carried a .265 velocity—13 percent of what is allowable. The June 13 [2007] blasting was reduced further, he said.*

<sup>30</sup> Forgione, Rick. “TOWN OF NIAGARA: Quarry blast injures woman,” *Niagara Gazette*, Jun 22, 2007, TOWN OF NIAGARA: Quarry blast injures woman | Local News | niagara-gazette.com.

<sup>31</sup> Illinois Department of Transportation and Vulcan Materials Company Reach Settlement on Joliet Road Closure, *IDOT*, May 17, 2010.

<sup>32</sup> Forgione, Rick. “TOWN OF NIAGARA: Quarry blast injures woman,” *Niagara Gazette*, Jun 22, 2007, TOWN OF NIAGARA: Quarry blast injures woman | Local News | niagara-gazette.com.

*"We understand the residents' frustration, but to be honest, we're equally frustrated because we have made changes and they still think it's an unacceptable level," Poole said. "It makes you question why a trailer park was put in that spot in the first place."*

*The shaking wasn't the only thing residents were complaining about Friday. Ruth said a huge cloud of yellow dust engulfed the mobile home park following the noon blasting. "It looked like little Bosnia out here again," she said.*

*A representative from the state Department of Environmental Conservation was at the park recording readings of the air during the work. Town Supervisor Steven Richards, who also was present at the time, said the impact felt no different than previous times. "That's totally unacceptable to me," he said, adding the cloud of dust and smoke was his primary concern. "That can't be healthy to the residents over there."*

*Richards said he is working with local, state and federal health and environmental officials in an attempt to secure a court order forcing LaFarge to stop blasting until the effects of the dust clouds can be tested....*

### **Blast Vibration Damage 5**

On November 5, 2013, a blast at a McCook quarry sent tremors that shook the western suburbs of the Village of La Grange, Illinois, which the quarry operator dismissed as a "routine blasting operation." Blasting at the quarry has been a rocky road for thousands of residents for more than a decade in dealing with the fallout from quarry blasting.

*According to the Village of La Grange, the company denies its blast was out of the ordinary and behind the tremor that shook the western suburbs just after 12:35 p.m.*

*"Hanson Material Service quarry has stated that they were performing routine blasting operations at 12:35 p.m. today and that the blast was consistent with their typical operations. The quarry reports that the recorded seismic readings related to the blast were below regulatory limits," according to a message posted on the village website.*

*"Further, the quarry states that approximately seven seconds after the blast, a separate seismic event was recorded. Hanson is in the process of reviewing the seismic readings in order to better understand what may have occurred, but at this time they are denying any correlation between their blast and the seismic event."*

*The U.S. Geological Survey (USGS) says the magnitude of Monday afternoon's blast in the western suburbs registered at 3.2, down from an initial estimate of 3.7 earlier in the day.*

*Patch readers have shared comments about the blast, which caused "pictures to jump off walls," and entire houses to shake, according to commenters.*

*Here's what people had to say on the La Grange Patch Facebook page:*

- *Dawn said she felt it downtown, near the train station. "We thought a truck hit the building in the alley, because that is a common occurrence."*
- *Liliana said, "My mom heard it and felt it at 50th and Ashland. She says she wouldn't be surprised if there are cracks in the walls of her house. Direct quote: 'It felt like the house shook right off of its foundation.'"*
- *Monique said, "We're real close to the quarry and felt a normal blast followed by the house levitating about 5 seconds later."*
- *Jamie said, "(It) Totally shook my house. Heard the blast. Felt the shake."*
- *Sean said, "Felt and heard it on Stone. Shook all the glassware in the cabinets."*
- *Karen said, "No way[,] it was the quarry... Oak Brook, Downers Grove, Hinsdale all reporting it too."*
- *Catrina said, "Not understanding how they can deny that the blast wasn't out of the ordinary!?! The apparently "ordinary blast" was heard before the tremor that shook our home and literary made me jump just from the sound. Now I'm not used to earthquakes, but do they normally make an explosion noise first?"*
- *Claudia said, "The entire 300 block Leitch ave shook."*
- *Karen said, "Foundation shook, felt like a truck hit the house, LaGrange Country Club area!"*
- *Tom said, "Felt on Hillgrove"*

- *Christine said, "We felt it in La Grange, whole house shook for several seconds. 0-100 blk N Spring"*
- *Bill said, "Felt strong in LGP (wife) and Wheaton (me) for a sec."*
- *Becky said, "All the neighbors in 100 block S Catherine."*
- *Melissa Felt it in Brookfield."*

For thousands of residents in and around southwest suburban McCook, it has been a rocky road for more than a decade in dealing with the fallout from quarry blasting.<sup>33</sup> Although some quarry operations have been there for a century-- using explosives to dislodge limestone-- the testy battle between community groups, companies and public officials is more recent and ongoing.... The I-Team obtained photos from one Countryside resident who says Monday's blast cracked walls and she thought her house was going to collapse. She and other residents who live around here say the concussion on Monday was the worst in years, although the ground shakes on a regular, sometimes daily, basis.

There was such damage to Joliet Road along the Vulcan Quarry in McCook that in 1998 state officials closed the roadway after determining it was unsafe for public use.

...[In 1010, after a 12-year legal battle] --- without admitting any wrongdoing — Vulcan paid a \$40 million settlement to the Illinois Department of Transportation [IDOT]. A repair project is now in its infancy-- with Joliet Road remaining closed-- and affecting motorists and rail traffic every day.

The one-mile stretch of Joliet Road...was closed in May 1998 because the road was substantially damaged and unsafe for vehicular traffic. The one-mile stretch runs through the middle of two Vulcan open pit quarry mines, one to the north and one to the south. IDOT experts concluded that the roadway was destabilized from years of mining by Vulcan Materials Company and any attempts to repair and reopen Joliet road would require frequent and expensive maintenance, including lane closures. Vulcan Materials at the time would not agree to the state-requested mining setbacks and land contribution that would have been necessary to implement any of the repair options suggested since the section of Joliet Road was closed. Since the closure, thousands of vehicles that used the road each day have been re-routed to arterial roadways.<sup>34</sup>

### Blast Vibration Damage 6

On April 25, 2017, a blast at the 54-acre Jefferson Quarry in Mankato, Minnesota, struck with such force that it was initially thought to be an earthquake. The quarry owner refused to accept financial responsibility for the widespread damage caused to the homes of 128 nearby residents,<sup>35</sup> despite evidence of flyrock debris. The quarry blast was amplified by atmospheric conditions to create the equivalent of a magnitude 2.8 earthquake, and was heard miles away.<sup>36</sup>

*A blast at a locally owned quarry here two months ago struck with surprising power. An earsplitting boom was followed by a violent trembling that shook homes and garages to their foundations, toppled lamps off tables and knocked one man over as he tended his backyard garden.*

*In the investigations that followed, a government scientist said the ground shook because of an explosion at the Jefferson Quarry. But the mining company said its own research found that an earthquake had struck the city seven seconds after it set off charges.*

*The resulting standoff has left homeowners wondering who will pay for all the cracked plaster and other damage, and whether it will be months or even years before legal action can resolve who's at fault.*

*"Nobody wants to take responsibility for anything," said Ann Helgeson, who bought her house adjacent to the quarry just weeks before the ground shook. She was home with her young son that day when the house started to shake from the cellar up.*

*Now, the freshly painted walls are cracked and portions of the once-flat floor dip. Gaps can be seen where the living-room ceiling meets the wall. "We've got cracks upstairs everywhere," said her 6-year-old son, Gage.*

<sup>33</sup> "Recent quarry blast not the first to shake McCook," *abc30*, November 5, 2013, <https://abc30.com/archive/9315049/>.

<sup>34</sup> Illinois Department of Transportation and Vulcan Materials Company Reach Settlement on Joliet Road Closure, *IDOT*, May 17, 2010.

<sup>35</sup> McKinney, Matt., "Was Mankato boom a mine blast or an earthquake?," *Star Tribune*, July 2, 2017.

<sup>36</sup> <https://www.duluthnewtribune.com/news/4256859-mankato-quarry-blast-rocks-city-feels-earthquake>.

*Helgeson's insurance company inspected the damage in early May and left her thinking that it would be covered. It wasn't until a letter arrived in the mail last week that she learned the company had determined the cracks were caused by natural settling and therefore were not insured....*

*Left without other options, Helgeson said she's hoping someone from the city will step in to help her and some of the other 128 homeowners who reported damage.*

*"I myself have been saying the city should start a class-action lawsuit against [quarry owner Jordan Sands]. We need somebody impartial to come in," she said.*

Following the April 25, 2017, quarry blast, the city suspended the quarry's permit, and again in August 2017 after several neighbours reported an August 8, 2017 quarry blast that launched flyrock debris and damaged neighbouring properties. In September 2017, the Mankato Department of Public Health informed the quarry owner that its permit would not be reactivated. An investigation had shown "that there is public safety danger with the use of explosives at the quarry."<sup>37</sup>

### **Blast Vibration Damage 7**

On May 13, 2015, a quarry blast, which prompted the city of Augusta, Maine, to file a lawsuit, caused damage to the homes of neighbouring residents.<sup>38</sup> As expected, the quarry operator denied responsibility for the damage.

*Some residents near a quarry operation in a pit off West River Road that has been controversial with its neighbors say a May blast that prompted the city to file a lawsuit also caused cracks in the floors of their homes.*

*A resident who lives about two-tenths of a mile [322 metres] north of the pit's entrance on West River Road and roughly 2,000 feet [610 metres] away from the pit itself says she believes the concrete floors and walls of the basement in her 8-year-old home were cracked by the May 13 blast, which she said felt and sounded like a bigger blast than other blasts at the pit owned by Steve McGee Construction.*

*Donna Bonenfant said gaps of roughly a quarter-inch opened up between several of the floor joists and the main support beam of the main floor of her home, visible from the basement, gaps which she said weren't there before the blast. What appear to be water stains are visible around some of the cracks in her basement walls.*

*"I don't know what to do about these. What if it leaks?" Bonenfant said, pointing to one of several cracks spread across parts of the concrete basement floor of her home. "I know to expect some cracks, but this many? A cement contractor looked at it and said there is no way all these cracks would come from just the house settling."*

*Across the Kennebec River from the pit site, Riverside Drive resident John Liacos said he noticed hairline cracks in some of the ceramic floor tiles installed when his home's kitchen was redone in the spring of 2014, which he doesn't believe were there before the May [13, 2015] blast. He said he's also discovered small cracks in the drywall of the kitchen ceiling.*

*Liacos acknowledged he's not sure of the date when he first noticed the cracks, but said a contractor who looked at the cracks said they had to have been caused by "something serious," and Liacos suspects it was the blast.*

*Bonenfant and Liacos both said they contacted the company that did the blasting, Maine Drilling and Blasting, to file claims for the damage. Both said their claims were rejected.*

*"We got a letter saying, sorry, we're not responsible for it," Liacos said. "If nobody is willing to admit it, what are you going to do? I want to be treated fairly. I was hoping to get some sort of resolution from Maine Drilling and Blasting."*

Cheri and Pietro Nicolosi, who live on Kenneth Street in the Grandview neighborhood about 1,000 feet (305 metres) from the West River Road quarry operation filed a lawsuit on July 7, 2017, against the city of Augusta, McGee Construction, and Maine Drilling and Blasting seeking compensation for

<sup>37</sup> Goodrich, Kristine., "County attorney declines to file charges in quarry blast," *The Free Press*, Oct 11, 2017. [https://www.mankatofreepress.com/news/local\\_news/county-attorney-declines-to-file-charges-in-quarry-blast/article\\_ed0f241e-aece-11e7-b449-0bee8d49d9c0.html](https://www.mankatofreepress.com/news/local_news/county-attorney-declines-to-file-charges-in-quarry-blast/article_ed0f241e-aece-11e7-b449-0bee8d49d9c0.html).

<sup>38</sup> Edwards, Keith., "Augusta quarry pit neighbors say blasting damaged Homes," *Kennebec Journal*, September 21, 2015, <https://www.pressherald.com/2015/09/21/augusta-quarry-pit-neighbors-say-blasting-damaged-homes/>.

damages to their home and to have McGee's permit to blast and extract rock at the quarry site revoked.<sup>39</sup> The lawsuit claims blasting close to the Grandview neighborhood constitutes an "ultrahazardous activity," poses a high degree of harm and is an abnormally dangerous activity."

...[The lawsuit] alleges that since 2011, the couple's home, in the Grandview neighborhood about 1,000 feet [305 metres] away from McGee's quarry, sustained "cracks in the basement, damage to exterior walkway and driveway, floor tile cracks, nails popping, wall cracking, issues with water quality, uneven living room bay window, grout in bathroom floor deteriorated, shower lead [sic] issues, black mold in dishwasher and shower, and problems with a dining room light and the septic system.

An August 22, 2017 report prepared by Golder Associates,<sup>40</sup> in response to numerous complaints to the City of Augusta, Maine, over the past 15 years concerning blasting at the McGee quarry. Golder did not bother to review the submitted complaints", but understands the file includes numerous complaints related to emotional distress and concerns about structural impacts to (22 homes)" located roughly 750 to 1,700 feet (229 to 518 metres) north off the quarry. In this respect, the Golder report made the following admissions:

10. It is possible that poor foundation support conditions for a home may present conditions more susceptible to structural damage from blasting vibrations than typically cited in the literature....

11. It is possible that geological conditions and/or site-specific structure response from blasting vibrations could present conditions more susceptible to structural damage than typically cited in the literature....

13. All of the blast vibrations reviewed would be considered "strongly perceptible" to "disturbing" based on human perceptions of blasting... This conclusion is consistent with information presented by MD&B in their 11/10/16 presentation. Human beings can detect vibrations as low as about 0.02 in/s [0.508 mm/sec].

14. Human perception and quality of life criteria are a significant and increasing factor in the development of allowable vibration and airblast overpressure standards for blasting ordinances for quarries and construction. Criteria based on structural damage probability versus that for quality of life are a common controversial issue pitting annoyance and emotional effects of nearby residents against the financial interests of quarry operators and construction companies.

15. Review of allowable vibration criteria for other selected towns/cities in Maine, Maine DEP guidelines for quarries..., and European guidelines indicate Augusta's current criteria are similar to somewhat more restrictive than most, but there are exceptions. Of those reviewed, the City of Westbrook appeared to have the most restrictive vibration criteria for quarry blasting in Maine (0.5 in/s [12.7 mm/sec] maximum PPV for all cases except for a specific residence where 0.25 in/s [6.35 mm/sec] applied). Review of selected international standards indicates Germany has one of the more restrictive European guidelines with residential vibration limits between 0.2 and 0.8 in/s [5.08 mm/sec and 20.32 mm/sec] depending on frequency – these criteria appear to be intended to eliminate the possibility of even minor structural damage and substantially limit human complaints.

### Blast Vibration Damage 8

In *School District No. 162 et al. v. Grosshans & Petersen, Inc.* (1959),<sup>41</sup> the trial court found the quarry operator responsible for damages to the plaintiffs' properties caused by ground vibrations stemming from quarry blasting, a ruling upheld by the Supreme Court of Nebraska. The blasting activities that led to the vibration damage are described as follows:

<sup>39</sup> Edwards, Keith. "Lawsuit over blasting filed against city of Augusta, local construction, blasting firms," *Kennebec Journal*, updated July 27, 2017. <https://www.centralmaine.com/2017/07/26/lawsuit-over-blasting-filed-against-city-of-augusta-local-construction-blasting-firms/>.

<sup>40</sup> "Preliminary Findings, Review of Selected Blasting Records and Project Information, McGee Quarry, City of Augusta, Maine," Golder Associates, August 22, 2017.  
[https://cms6.revize.com/revize/augustame/GolderReport\\_170822%20Augusta%20Prelim%20Findings.pdf](https://cms6.revize.com/revize/augustame/GolderReport_170822%20Augusta%20Prelim%20Findings.pdf)

<sup>41</sup> *School District No. 162 v. Grosshans & Petersen, Inc.*, 99 NW 2d 601, 169 Neb 357 – Neb: Supreme Court 1959.  
[https://scholar.google.ca/scholar\\_case?case=16359838068859829093&q=school+district+no+162+v+grosshans+%26+petersen+inc&hl=en&as\\_sdt=2006](https://scholar.google.ca/scholar_case?case=16359838068859829093&q=school+district+no+162+v+grosshans+%26+petersen+inc&hl=en&as_sdt=2006).

*Beginning about December 23, 1955, and at various times until April 27, 1956, defendant used dynamite to blast rock in the quarry. The blasting was so done as to break the rock into pieces sufficiently small to go through a crusher so that the rock could be used in highway construction. Defendant often prepared as many as 48 holes for one explosion. These were drilled to depths of as much as 20 feet (6.1 metres). Dynamite was placed in these holes to within 30 to 36 inches (0.762 to 0.914 metres) of the top. Dirt was then tamped in the holes to lessen any upward push of the explosion. The dynamite was so wired that it exploded in "delays" of 25/1000 of a second, and there were from two to four delays in each explosion. Beginning December 23, 1955, and ending April 27, 1956, defendant exploded dynamite 2 days in December, 9 days in January, 10 days in February, 21 days in March, and 11 days in April. On several days there were two and sometimes three and four explosions a day.*

The age and condition of the schoolhouse before the quarry blasting operations, and the damage to the schoolhouse from the ground vibrations, are described as follows:

*The school building was built about 1920. It was of brick construction on a concrete foundation. There was no steel reinforcement. Sometime before 1954, a settlement crack appeared in the east wall. That was repaired in 1954. There is also evidence of some replastering that was done before that time. The building was inspected, repaired, and repainted in 1954.*

*During the months of the blasting, large cracks appeared in the walls of the schoolhouse where the brick separated, and cracks appeared in the plaster on the walls and ceiling, and in the concrete tunnel in the basement. Bricks pulled away from joists at the top of the walls. The extent of these cracks need not be recited as the extent of the damage to the building is not an issue here. It is sufficient to point out that they appeared to a large extent in that part of the building that received the first impact of vibrations from the quarry.*

The quarry is located about one-half mile (805 metres) from the schoolhouse and lay witnesses within a 2½ mile (4.02 kilometre) radius of the schoolhouse, and other witnesses closer to the schoolhouse testified as to the damage caused by ground vibrations emanating from blasting operations at the quarry.

*Plaintiffs offered evidence of lay witnesses living within a radius of 2½ miles (4.02 kilometres) of the schoolhouse, and other witnesses who were close to or in the schoolhouse when blasts occurred. These witnesses described the effects of explosion blasts at the quarry which they observed as "the house shook"; "vibration" was felt when a car was driven near the quarry; "barn vibrated"; the "house commenced to quiver and the windows rattled"; "dishes rattled in the cupboard"; an elevator building "shook," windows rattled, and "the bars on my scale \* \* \* rattled"; "could feel the ground shake"; cans on the shelves of a store "shook" and the floor "shook"; china in a cabinet "shook"; large rocks (flyrock debris) were blown out and upon land of one of the witnesses; the blast "shook the earth"; a furnace rattled; in the school building the blast "shook us"; light fixtures swayed; and there was rattling of the windows and vibration in the schoolhouse.*

*The above paragraph is not an all-inclusive statement of the evidence of what lay witness after witness testified as to what they saw and observed.*

The testimony of the quarry operator's expert witness that "there is no direct evidence that explosions at the quarry caused the damage to the school building" was rejected in favour of the plaintiffs' expert, whose credentials and testimony were accepted by the trial court:

*Plaintiffs' expert witness was examined and cross-examined extensively and often as to his qualifications. He was a graduate of the College of Engineering of the University of Nebraska; he worked for several years as a structural engineer designing power plant buildings; he worked with a consulting engineering firm doing structural design and cost estimates on schools, churches, dwelling houses, warehouses, and factory buildings; his work involved the structural soundness of masonry walls; in training and practice he had made a study of the various causes of structural failures in buildings in order to avoid their recurrence in buildings designed; he had had formal training in the effect of vibration on structures and in dealing with the loads which come or fall on structures caused by vibration; he had studied writings devoted solely to the subject of ground vibrations; in his practical experience he had noted the effect of forces upon buildings; he had read technical articles and books upon building failures; he had knowledge of the nature of the ground between the quarry and the schoolhouse; he had examined the exposed soil profile at the quarry and made a soil boring at the schoolhouse; and*

*he explained the types of vibrations which occur in the soil when an explosion occurs. He testified that in his opinion the damage was caused by a horizontal movement of the bearing walls; as to the effect of a repetition of vibrations, which singly might not cause a failure but if repeated eventually could do so; and that the appearance of the damage may be delayed.*

*The witness was permitted to testify as to the age, in his opinion, of the cracks in various parts of the building. His testimony in this regard was largely corroborative of the custodian's evidence. He gave as his reason the difference of color of the surface in contrast with the surface of the cracked area, the absence of dust or debris, etc. The witness was also permitted to testify that in his opinion the damage to plaintiffs' building (other than the settlement cracks which appeared earlier and which no one claims were caused by defendant) was caused by a horizontal force which was vibration in the ground.*

*On cross-examination the witness testified that wind was not the cause of the failure and that the only other possible source of failure was a ground movement exerting force upon the building. He distinguished a settlement crack from the cracks here involved. He testified that the ground vibrations were the only possible cause of the cracks and other conditions that appeared in the building during and after the blasting operations of the defendant.*

In fixing the quantum of damages, items requiring repair which existed prior to the quarry operator's blasting operations were excluded from the trial court's award.

*Plaintiffs' expert witness on damages excluded any items requiring repair which existed prior to the defendant's blasting operations. He fixed the fair and reasonable cost for the repairs, including architect's fee, at \$53,900. Defendant's expert witness made like exclusions and fixed the reasonable cost of repairs at \$23,100. Defendant here states that there is no evidence that repairs to preexisting damage were required in order to effect repairs to the damage claimed to have resulted from the blasting. The jury fixed the damages at \$25,750.*

### **Blast Vibration Damage 9**

Residents in an upscale suburb of Masvingo, Zimbabwe, have had their homes damaged by blasting at the nearby Chifen Quarry, which became operational in 2019.<sup>42</sup>

*Scores of houses in Zimre Park, an upmarket suburb in Masvingo have allegedly been damaged by quarry blasts taking place on the outskirts of the city, a charged meeting of residents heard yesterday.*

*Zimre Park Residents Association is now demanding compensation from Chifen Engineering and Hardware for houses whose window panes were shattered, buildings walls and pillars that developed cracks and ceilings that collapsed as a result of the mining process.*

*The residents also want Chifen to immediately stop blasting at the mine until its operations are rectified and considered safe.*

*The worst blast took place on August 29, 2020 and lawyers representing residents and Chifen have exchanged letters on the issue.*

*One of the residents who declined to be named said that his child survived death when a ceiling that fell during the blast missed his head by a whisker.*

*The meeting of stakeholders held at Chifen Quarry mining site along Harare Masvingo Highway yesterday [March 9, 2021] sought to resolve the issue. Residents complained that in addition to the damages, their houses shook heavily each time there is a blast at the quarry which is 3km from the suburb.*

*The meeting also attended by The Mirror brought together representatives of the association including the chairperson Farai Makunike, officials from the Ministry of Mines, a representative of Ward councillor Against Chiteme, Masvingo City Council officials and officials from the Environmental Management Authority.*

*Chifen was represented by the mine manager Ephraim Mutemachani, What irked residents is that Chifen management allegedly accepts responsibility for the damages during face to face meetings but refuses the same once the matter is reduced to writing.*

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Mandigora, Mike., "Quarry mine blasts damage Masvingo houses," *The Mirror*, March 10, 2021, <https://masvingomirror.com/quarry-mine-blasts-damage-masvingo-houses/>.

*Chifen lawyers Mutendi, Mudisi and Shumba Legal Practitioners refused responsibility for the damages in a letter written to residents.*

*However, residents said the same company had already repaired councillor Against Chiteme's house in the same area that was damaged by the blasts.*

*The letter from the lawyers said that the damage to the houses could have been caused by vibrations from vehicles using Harare Masvingo Highway, swelling and shrinkage of building material or chemical changes in mortar, bricks and plaster.*

*Chifen however, said that they were bringing in blasting experts to look into the matter and ensure that their work will be safe....*

*"We are also doing an assessment on the damages and will only act when the results are out," said Mutemachani.*

### **Blast Vibration Damage 10**

Despite overwhelming evidence of extensive property damage from ground vibrations (clearly visible in the CBS 42 video) and presented in a follow-up April 30, 2021 CBS article, to homes in Alabama from within a half-mile (805 metres), the nearby quarry owner, Vulcan, denies responsibility for the damage.

*If you've ever experienced an earthquake, it's probably something you'll never forget. For neighbors in Tarrant who live within a half-mile of Vulcan Materials, that's how they described what it feels like when the company blasts every week.*

*... The company uses explosives at its quarry to make gravel, sending off shots about once or twice a week, sometimes more.*

*"If you're in the homes it feels like dynamite has went off at your house," Tarrant resident Emma Walters said.*

*The foundation of Walters' home is crumbling. She told CBS 42 she fears that it will cave in one day. Cracks along the front of her house send water flooding into her basement when it rains, and the inside is marked with splits along the walls.*

*"I know they have a right to make a living, but they don't have a right to destroy my home. My home is all I've got," she said. "My husband and I worked for years for that..."*

*Despite falling within the proper legal limits, resident(s) are now giving their complaints to city officials. During the Tarrant City Council meeting last week, several residents shared stories of startling sounds, trembling homes and damages they believe were all the result of blasting.*

*"You all come to our neighborhoods, and you tear up and you tear up and you tear up, under the auspices of the guise of the government," said Tarrant Mayor Pro Tem Tracie Threadford. She explained blasting is even impacting her own home.*

*Randy Jones, area operations manager at Vulcan Materials, was at the meeting, where he told neighbors while the blasts may cause loud sounds and homes to rattle, the vibrations are monitored and are not strong enough to cause damage.*

*Residents did not react well to that statement. Many were visibly upset, and soon after shared their stories. One woman even handed out photos showing her ceiling caved in, claiming it was from a blast. She said she now wants to sue....*

*Since that public hearing, Fleming reported several residents called with complaints, and Vulcan Materials had seismographs installed near their homes to monitor vibrations for future blasts. He added that has been their protocol all along, but there was an influx in phone calls since the hearing. Several seismographs are already installed throughout nearby neighborhoods and monitored for every blast....<sup>43</sup>*

*We first told you about neighbors concerned about blasting damage in Tarrant last week.*

*Since then, CBS 42 has heard from more residents claiming the blasts from Vulcan Materials are causing their foundations to crumble and causing cracks all throughout their homes.*

*Cynthia Hurd Threatt says the blasts caused her ceiling to cave-in twice.*

*"I heard this thud by the time I got to my bedroom and I came back and looked and my whole living room ceiling was raining sheetrock," she told CBS 42.*

<sup>43</sup> Vincente, Chloe. "Can Blasting in Tarrant damage your home? Residents say yes, company says no," CBS42, April 30, 2021," <https://www.cbs42.com/your-voice-your-station/can-blasting-in-tarrant-damage-your-home-residents-say-yes-company-says-no/>.

*The Alabama State Fire Marshall, who regulates blasting in the state, says he is aware of the growing concerns for residents living near Vulcan Materials. He says he spoke with the Tarrant Fire Department and as of now, they will handle the reports about damages locally. An official with Vulcan Materials says, since a City of Tarrant public hearing last month about the blasting, they have received more phone calls from those living nearby and additional calls after CBS 42's Your Voice Your Station report.<sup>44</sup>*

### **Blast Vibration Damage 11**

A group of more than 200 homeowners filed a multi-million-dollar class action lawsuit against Rinker Materials and six other companies over the effects of blasting limestone in Northwest Miami-Dade County.<sup>45</sup>

*The group is seeking \$22 million in damages, claiming the blasting has badly damaged houses, cracking walls, foundations and swimming pools.*

*“We have a right to live in our homes and enjoy peace and quiet without having them violently shaken. We want this to stop and to also get some compensation for our damages,” said Michael Pizzi, president of Citizens Against Blasting and a Miami Lakes community council member. David M. Wells, an attorney for Rinker Materials, said the Ocala-based company has been blasting in West Dade for 30 years and complies with Miami-Dade law. “We are completely confident that we have not caused any homeowners damages,” he said. “We look forward to reading the lawsuit and hopefully sitting down with residents to do some talking.”*

*He said there has always been blasting in the area and the problem is that more homes are being built closer to the blasting site.*

*The other companies named in the suit are Vecellio Realty Inc., WRQ Property Associates, Tarmac Florida Inc., Sunshine Rock Inc., Sawgrass Rock Quarry Inc. and Pelmad Corp. All are Florida-based and run operations in Northwest Dade.*

*Although two of the firms are not blasting companies, Gonzalo Dorta, an attorney for Citizens Against Blasting, said they are also liable.*

*“Those companies either subcontracted the blasting companies or own the land and pulled the permits to blast,” said Dorta. He noted that under Florida case law the companies are responsible for any negligence resulting from ultra-hazardous activities, including explosions. Residents of the affected areas, which include Country Club of Miami, Palm Springs North, Miami Lakes and Hialeah Gardens, said blasting has continued unabated for the past two years. They said they have called county officials on numerous occasions to take action – all to no avail.*

*“There was this one humongous blast recently, three to four times stronger than all the others. It felt like the earth moved,” said Nanette Maccari, who lives in Country Club of Miami. “I could hear my house creaking. My bookshelves came crashing down and the chairs in my house were wobbling from side to side. I felt dizzy and I burst into tears.”*

*Maccari showed a notebook in which, she said, she has logged the time, day and damage of each blast for the past year.*

*Some homeowners claim they've lost personal items as well.*

*“See here, this is a picture of my daughter when she was 6 years old. It was shattered because of a blast,” said Yolanda Arroyo, a resident of Palm Springs North.*

*Pizzi said builders and real estate companies failed to notify some homeowners about the blasting. A Miami-Dade ordinance requires that prospective buyers be told if blasting is occurring within a two-mile radius of the home they contemplate buying.*

Note: Florida's blasting damage compensation statute was passed during the 2025 legislative session and took effect on July 1, 2025. It redirects all blast-related property damage claims to the Division of Administrative Hearings (DOAH), barring civil lawsuits. On June 17, 2025, Town of Miami Lakes Council voted unanimously to sue the state over the blasting law.<sup>46</sup>

<sup>44</sup> Vincente, Chloe. “More neighbors report blasting damage following CBS 42 investigation,” *CBS42*, May 7, 2021, <https://www.cbs42.com/your-voice-your-station/more-neighbors-report-blasting-damage-following-cbs-42-investigation/>.

<sup>45</sup> Yee, Ivette M., “200 Residents File Suit Over Blasting,” *MiamiHerald.com*, 200 Residents File Suit Over Blasting. | Dorta Law.

<sup>46</sup> Herrera, A. (2025, July 2). *Council votes to sue state over blasting law*. The Miami Laker. <https://miamilaker.com/News-Article/council-votes-to-sue-state-over-blasting-law>

### Blast Vibration Damage 12

On December 5, 2019, vibrations from a blast at a quarry in Raleigh County, West Virginia, shook homes and caused damage to property in nearby neighbourhoods.<sup>47</sup>

*A series of explosions that have rocked Maxwell Hill residents for two years are the result of blasting at a rock quarry on Sand Branch Road, Raleigh County Emergency Operations Center officials said Thursday [December 5, 2019].*

*Maxwell Hill resident Jim O'Dell, 79, said that he and his neighbor, Mary Peters, heard the blast at 4:07 p.m. on Thursday. He said that, for the past two years, he has heard loud blasts that tend to start at 4 p.m.*

*The blast on Thursday was bigger and shook his house.*

*"I always thought, 'That's manmade,' " he said. "But today, it almost shook the roof off of my house.*

*"I've been living here for 47 years, and that's the heaviest blast I've ever felt."*

*Several more residents called The Register-Herald to report the blasts. One caller was from the Bluefield area of Mercer County....*

*Officials reported that the EOC does not receive prior notification from Appalachian Aggregates on days that the blasts are planned.*

*They do receive calls from citizens, they reported....*

*Another EOC official reported that several citizens had called EOC Thursday to report the blasts, which is not uncommon when the company is blasting.*

*O'Dell said Thursday evening that the Thursday blast was not considerate of area residents or property owners.*

*"Why are they shaking everybody's houses around here?" O'Dell asked. "That's too big of a blast.*

*"It's bad enough to crack a concrete floor."*

*O'Dell suggested that The Register-Herald call Del. Mick Bates (D-Raleigh). Bates owns Bodyworks, a health club in Maxwell Hill.*

*"He doesn't want his chandeliers shook out of the ceiling," O'Dell added.*

*Bates said he also heard the blast.*

*"That was a pretty loud bang," Bates said. "I was doing other things.*

*"I didn't feel anything here, but the percussion was pretty intense.*

*"I didn't have any issues with power or equipment," he added.*

*O'Dell's wife said the couple's ceiling was cracked after the explosion.*

### Blast Vibration Damage 13

In November 2016, vibrations from a blast at the Sarawak quarry, Kemble, Ontario, then owned by Harold Sutherland, caused damage to the neighbouring Wilcox's home, for which they were inadequately compensated, and that terrified the family.<sup>48</sup>

*We live at... Grey Road 1, Kemble... directly south of the proposed Sarawak Quarry Expansion. E lines of our property butt against this proposed expansion site.*

*We built our home in 2006. The quarry we were told at the time was 'dead' by our real estate agent, and as such we purchased the land and built our dream home. Over the years we have built a couple of structures on our property... We recently completed renovations to the inside of our home, upgrading our kitchen...and created a walk-out basement only a few years ago...and spent several thousand dollars on concrete driveways and sidewalks....*

*The expansion of this quarry means that trying to sell our property will become impossible because nobody will want to buy our house with quarry equipment stored in plain site [sic] of the house, as we currently have to view daily. Nobody will want to pay what our house is worth to look at this eyesore daily. Nobody will want to buy our house for fear the property (open field) to our north will become littered with more machinery, equipment, piles of things, trailers, rubble, rock, gravel, etc. And nobody will want to buy our house because of the constant noise experienced when these pieces of equipment and machinery come to and from this space.*

<sup>47</sup> Farrish, Jessica. "Quarry blasts cracks neighbors' ceilings," *The Register-Herald*, Dec 5, 2019, [https://www.register-herald.com/news/quarry-blast-cracks-neighbors-ceilings/article\\_4eecbd93-1963-588e-a213-dfb7bf6c9a6b.html](https://www.register-herald.com/news/quarry-blast-cracks-neighbors-ceilings/article_4eecbd93-1963-588e-a213-dfb7bf6c9a6b.html).

<sup>48</sup> <https://pub-georgianbluffs.escribemeetings.com/filestream.ashx?DocumentId=1422>.

*A blast occurred at the existing quarry in November 2016...That blast scared the living daylights out of my husband who was in the upstairs of our big garage when it went off, causing the drywall in the upstairs loft he was in to crack along most every seam. At the time this occurred, the Ministry, Township and County were all contacted by us, and we got the same story from everyone – that the blast was in acceptable limits.*

*We call bull on that – because acceptable limits do not cause my husband to flee from his place out of fear, and it certainly would NOT cause damage to our property Harold Sutherland sent an inspector to view the damage, and we were paid by them \$500 to fix the damage. Our quote was more than twice this amount. So not only did this blast cause damage, it also caused us financial setback, distress, worry and fear it will keep happening, only for use to be told “it’s all acceptable”.*

#### **Blast Vibration Damage 14**

In a 2003 lawsuit filed against Vulcan Materials, 57 residents sought to be compensated for damages to their homes from vibrations caused by blasting at the 137-acre Bellwood Quarry in northwest Atlanta, Georgia.<sup>49</sup>

*Neighbors say blasting by quarry damages homes. Lawsuit by 57 residents calls for home repairs, end of detonations...*

*Mary Hollifield says she had to nail this painting to the wall to keep it from falling from the detonations at the nearby county-owned quarry. Officials of Vulcan Materials, which rents the quarry, deny their work causes damage.*

*Kitchen cabinets are coming loose from the walls, linoleum floors are sinking and ceilings are cracking. All this and more from dynamite blasts at the Bellwood Quarry in northwest Atlanta, say residents of the neighborhood next door. “I thought it was some kind of earthquake,” said Anne Johnson, a 63-year-old part-time school crossing guard who lives in the adjacent Grove Park area. “I just want to be comfortable. That’s all.” Johnson and her husband, a retired cabdriver of 30 years, are still paying off their home on Francis Place that they bought for \$8,500 in 1969....*

*The homeowners want Vulcan to stop blasting at Bellwood and to pay for damages to their homes....*

*The residents’ lawsuit comes a month after state Insurance Commissioner John Oxendine said his office would examine the 1978 state code that governs commercial blasting to determine if it is too weak. The state decided to look into regulations after complaints from people who live near Hartsfield International Airport, where blasting has taken place to build a fifth runway. Residents there also want the blasting stopped....Residents are mostly low-income and predominantly black. Many residents are retired. “it’s been traumatic,” said Mary Hollifield, president of the Grove Park Neighborhood association and a retired teacher whose kitchen floor is sinking. “I like it here. I don’t want to go anywhere else...”*

*The previous quarry renter, C.W. Matthews Contracting Co....sold that company’s quarry rights to Vulcan in 1997. Before the sale, Matthews set aside \$150,000 for a “residential neighborhood claim fund.” The fund was “established for the payment of damages to any residence located adjacent” to the quarry. Residents found out about the money last year, when they sought help from Fulton County Commissioner Emma Darnell, who represents the area. The Grove Park Residents’ lawyer, Cooper Knowles, said Darnell told the residents that a board would have to be appointed to decide if money was due....*

*Neighborhood residents say the blasts are occurring less frequently – weekly rather than daily as was the case when Matthews mined the quarry. Still, residents say in their lawsuit, the blasting violently shakes homes, causing structural damage including, but not limited to, cracks and holes in walls, ceilings, beams and foundations, broken water and sewage pipes, and broken windows....*

*Residents of Grove Park said they didn’t begin to realize that the blasting was so destructive until many of them grew older and retired, meaning they were home more during the day when*

<sup>49</sup> “Neighbors say blasting by Vulcan damages homes,” *Aggregate Research.com*, May 9, 2003, <https://www.aggregate-research.com/news/neighbors-say-blasting-by-vulcan-damages-homes/>.

*blasting occurred. What they discovered are walls that rumble and pictures falling off the walls, they say. "I wish they'd stop," said Dorothy Mayes, 72. "I'm too old. I don't want to sell.*

Note: On June 30 (2006), the city of Atlanta bought Vulcan's interest in its long-term lease for \$25 million and Fulton County's underlying fee interest for \$15.2 million. The quarry occupies 137 acres....and will be converted into a new 300-acre park and greenspace...<sup>50</sup>

### Blast Vibration Damage 15

In 2003, Circuit Court Judge Markley Dennis of Moncks Corner ruled that the settlement of the class-action against Martin Marietta, operator of the Berkeley Quarry, was fair.<sup>51</sup>

Attorney Dawes Cooke of Charleston, the 2003 court-approved settlement administrator, told The Times and Democrat Thursday that "any property owner (within a five-mile radius of Martin Marietta) was entitled to make a claim ... "However, he said very little money has been awarded to landowners. He said he received a total of 675 "past claims," but some of the claims were rejected [emphasis added]. Cooke said the \$1 million settlement fund was depleted last year (2008).

...Carolyn Davis of 1467 County Line Rd. maintains that Martin Marietta has not kept its promise to the community.

Davis said her roof leaks, her yard contains numerous sinkholes and she's been forced to purchase bottled water for 33 years because of the "rusty water" produced by her inadequate well. She said Martin Marietta previously dug a new well for her but "it didn't work."

"When the people blast at the quarry, pictures fall off the wall" of her home, Davis said.

"I haven't received any money from them. My septic tank has sunk in, and I don't have good water yet," she added.

Davis noted that prior to the development of the rock quarry, she didn't have any problems with her well and she wasn't faced with constant home repairs.

J.W. Garrett, who lives about a mile from the Martin Marietta site, said when the quarry began operating about 35 years ago, "it didn't take them long to do the damage." The blasts at the quarry "feel like earthquakes," he said, adding that "a lot of people's wells went dry" when the quarry work began....

### Blast Vibration Damage 16

In According to a February 24, 2003, news release, residents of a Berkley County community rejected a settlement offer of \$1 million from Martin Marietta's twin limestone Berkeley Quarry, on the Orangeville-Berkley county border of South Carolina, payable over four years to more than 700 residents to a 5-year-old lawsuit, with the potential to receive an additional \$4 million over the next 40 years subject to several conditions. Any property owner within a five-mile (8.05-kilometre) radius was allowed to make a claim:<sup>52</sup>

The company has offered \$1 million to more than 700 Cross residents to settle the 5-year-old lawsuit.

Residents say sinkholes, cracked brickwork and rusty water are the results of years of blasting at twin limestone quarries on the Orangeburg-Berkeley county border.

They say the \$1 million and a conditional promise of future reparations for damages is not enough.

Carrie Spann and other members of the Concerned Citizens of Cross Committee plan to help neighbors fill out as many opt-out forms as possible before a March 15 deadline.

"The best way to send a message that we are unhappy with the proposed settlement is to opt out," Spann said. "The quarry wants us to accept this settlement. Not only will they be rid of us, but also future generations -forever."

The proposal states those who accept the settlement and their heirs lose the right to sue Martin Marietta. [underscoring added]

<sup>50</sup> <https://www.atlantaga.gov/home/showpublisheddocument?id=1677>.

<sup>51</sup> Maratha Rose Brown, "'We need our money,' say picketing residents near MMM quarry," September 14, 2009, [https://thetandd.com/news/we-need-our-money-say-picketing-residents-near-mmm-quarry/article\\_1075045c-1b39-54a2-9f0e-ac9b6c44c93f.html](https://thetandd.com/news/we-need-our-money-say-picketing-residents-near-mmm-quarry/article_1075045c-1b39-54a2-9f0e-ac9b6c44c93f.html)

<sup>52</sup> "Many Cross residents reject Martin Marietta settlement," *Associated Press*, Feb. 24, 2003. <https://www.goupstate.com/story/news/2003/02/25/many-cross-residents-reject-martin-marietta-settlement/29661709007/>

"If too many people opt out, they have the right to withdraw the agreement," Spann said. Cross residents want to send a message to Circuit Judge Markley Dennis to reject the proposed settlement as unfair. Dennis is expected to rule April 1.

Thirty-four people had opted out before the original Jan. 20 deadline.

If Martin Marietta withdraws the settlement offer, the two sides could try to reach another settlement, or the case could go to trial.

"If a large number opts out and Martin Marietta pulls the settlement off the table, then you go back into a trial mode," said Chris Holmes, a residents' attorney.

If the suit is settled under the current proposal, Cross residents' lawyers will get \$1 million. If Martin Marietta withdraws the offer, the attorneys won't get paid until a new offer is negotiated. Residents would get \$1 million over four years, the life of Martin Marietta's mining permit, if they proved their damages were caused by quarry blasting. They potentially could get another \$4 million over the next 40 years.

The 40-year offer has a loophole, Spann says.

It requires Martin Marietta to pay \$100,000 a year for future damages, but it's based on the company's annual sales of quarry material, with 5 cents per ton going toward the future claims pot. If the company didn't meet its tonnage, it wouldn't have to pay, Spann said.

About 60 percent of 100 or so residents at a community gathering last week indicated they would opt out....

In 2003, Circuit Court Judge Markley Dennis of Moncks Corner ruled that the settlement of the class-action against Martin Marietta, operator of the Berkeley Quarry, was fair.<sup>53</sup>

Attorney Dawes Cooke of Charleston, the 2003 court-approved settlement administrator, told *The Times and Democrat* Thursday that "any property owner (within a five-mile radius of Martin Marietta) was entitled to make a claim ... "However, he said very little money has been awarded to landowners. He said he received a total of 675 "past claims," but some of the claims were rejected [emphasis added]. Cooke said the \$1 million settlement fund was depleted last year (2008).

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## Blast Vibration Damage 18

The Coalition for Responsible Environmental Aggregate Mining (CREAM) (2024) conducted a survey in Williamson County, Texas, from March to June 2024.<sup>54,55</sup> The results indicate that 97% of respondents reported adverse impacts on their property, air quality, and overall quality of life, and reside within a radius of approximately 0.5 to 2 miles (805 to 3,219 metres) of quarry boundaries.

- 97% of respondents had personally experienced negative impacts that damaged their property or degraded their quality of life.

<sup>53</sup> Rangle, Lauren. WilCo survey highlights concerns regarding rock quarries, push for new regulations," *Fox7*, June 13, 2024

<sup>54</sup> Coalition for Responsible Environmental Aggregate Mining (CREAM). (2024, May 17). *Better neighbors: Aggregate production operations in Williamson County*. Greater Edwards Aquifer Alliance. Retrieved from [https://aquiferalliance.org/wp-content/uploads/2025/08/Better-Neighbors-APOs-in-Williamson-County\\_final.pdf](https://aquiferalliance.org/wp-content/uploads/2025/08/Better-Neighbors-APOs-in-Williamson-County_final.pdf)

<sup>55</sup> Rangle, Lauren. WilCo survey highlights concerns regarding rock quarries, push for new regulations," *Fox7*, June 13, 2024. <https://www.fox7austin.com/news/williamson-county-rock-quarries-survey-regulations>

- 90% experienced vibrations from quarry blasts.
- 44% had property damage from quarry blasts.
- 60% observed excessive dust accumulating on their properties, raising concerns about air quality.
- 89% expressed concerned about decreases in their property value.
- Many residents were “unaware of the proximity and intensity of aggregate production operations (APOs) until after moving in.” Several individuals explicitly stated they were not told about nearby quarry activity or blast-related impacts when purchasing their homes.
- Narrative responses indicated that real estate disclosures were lacking, and that blast vibration, dust and truck traffic were unexpected post-purchase discoveries.

The survey collected responses from 177 individuals, with only one response which was pro-quarry, over a three-month period. Based on these findings, CREAM continues to advocate for stricter regulations aimed at mitigating quarry-related disturbances and fostering a more sustainable relationship between aggregate operations and local communities.

## AUTHOR'S DECLARATIONS AND ESSENTIAL ETHICAL COMPLIANCES

### *Author's Contributions (in accordance with ICMJE criteria for authorship)*

This article is 100% contributed by the sole author. He conceived and designed the research or analysis, collected the data, contributed to data analysis & interpretation, wrote the article, performed critical revision of the article/paper, edited the article, and supervised and administered the field work.

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No funding was available for the research conducted for and writing of this paper.

### *Research involving human bodies or organs or tissues (Helsinki Declaration)*

The author(s) solemnly declare(s) that this research has not involved any human subject (body or organs) for experimentation. It was not a clinical research. The contexts of human population/participation were only indirectly covered through literature review. Therefore, an Ethical Clearance (from a Committee or Authority) or ethical obligation of Helsinki Declaration does not apply in cases of this study or written work.

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### *(Optional) Research Involving Local Community Participants (Non-Indigenous)*

The author(s) solemnly declare(s) that this research has not involved local community participants or respondents belonging to non-Indigenous peoples. This study did not involve any child in any form directly. The contexts of different humans, people, populations, men/women/children and ethnic people are also indirectly covered through literature review. Therefore, an Ethical Clearance (from a Committee or Authority) and prior informed consent (PIC) of the respondents in this regard are NOT appended.

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To see original copy of these declarations signed by Corresponding/First Author (on behalf of other co-authors too), please download associated zip folder [Ethical Declarations] from the published Abstract page accessible through and linked with the DOI: <https://doi.org/10.33002/jpg050204>.

# Whispers in the Forest: The Enigmatic “Little People” of Indigenous Lore

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## ABSTRACT

This article pragmatically explores the cultural significance of the Little People in Indigenous lore, focusing on how these figures embody the values, beliefs, and environmental interactions intrinsic to Indigenous communities. Through an interdisciplinary methodology that encompasses qualitative data gathered from oral histories, ethnographic studies, and existing folklore analyses, this research uncovers the societal functions attributed to these enigmatic beings. Findings reveal that the Little People serve as custodians of ecological knowledge, embody moral teachings, and function as mediators between the human and natural worlds, reflecting a deep-seated respect for nature. These insights have discernible implications for healthcare, suggesting that integrating Indigenous narratives and ecological perspectives into modern health practices may enhance community well-being and mental health outcomes. By acknowledging the importance of these cultural figures, the research highlights the potential for harmonizing traditional Indigenous knowledge with contemporary healthcare approaches, thus advocating for a more holistic understanding of health that honors the interconnectedness of culture, environment, and well-being. The study ultimately calls for the incorporation of Indigenous folklore into health education and policy-making, recognizing its value in fostering cultural competence and improving health equity in Indigenous populations. The aim of this research is to explore the cultural significance and interpretations of the Little People in Indigenous lore, addressing the key issue of how these figures reflect the values, beliefs, and environmental interactions of Indigenous communities; this will require qualitative data from oral histories, ethnographic studies, and analyses of existing folklore to illuminate the societal functions and meanings attributed to these enigmatic beings.

**Keywords:** Indigenous folklore; Little People; Traditional ecological knowledge (TEK); Cultural health frameworks; Human-environment relationships; Holistic Indigenous well-being

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## 1. INTRODUCTION

Historically and contemporaneously, folklore and Indigenous folkways have served not only as a narrative medium but also as a vessel for cultural identity, communal values, and ecological knowledge in Indigenous societies. Among these narratives, the stories of the “Little People” resonate deeply, embodying a spectrum of teachings and moral frameworks that govern the relationships between human beings and the natural world. These enigmatic figures vary widely among distinct Indigenous cultures, often interpreted as guardians of ecological wisdom or embodiments of spiritual lessons, contributing to a rich tapestry of oral traditions that underscore the interconnectedness of culture and nature. Despite the significance of these narratives, there remains a notable gap in existing academic discourse regarding the multifaceted roles that the “Little People” play in Indigenous lore, particularly concerning their implications for contemporary ecological practices and mental health outcomes (Onyima, 2016a; Saber and Sassine 2022; Swiderska et al., 2022, p. 113).



Figure 1: Perspectives of Little People in Indigenous Lore. Source: OpenAI (2025). *Little People Lore* [AI-generated infographic]. ChatGPT (image generation). Unpublished.

This research seeks to address this void by investigating the cultural significance and interpretations of the “Little People” within various Indigenous communities and how these interpretations can enhance modern health practices by fostering a holistic understanding of well-being that incorporates environmental stewardship (Congretel and Pinton, 2020. p. 527-543; Turner et al., 2022, p. 627-651). The primary objectives of this study include analyzing the ecological knowledge embedded within the narratives of the “Little People”, exploring their societal functions across different Indigenous cultures, and examining their potential integration into contemporary health care strategies. By grounding this inquiry in qualitative data from oral histories and ethnographic studies, as well as in relevant folklore analyses, the research aims to illuminate the prevailing themes that emerge from the study of human interactions with these beings (Colvin et al., 2019, p.73-91; David-Chavez, 2024; Zidny et al., 2020, p. 145-185). The importance of this exploration extends beyond academic realms; practically, it serves as a call to integrate Indigenous wisdom into modern health frameworks to improve community

well-being and mental health outcomes, especially within Indigenous populations. In recognizing the intricate relationship between culture and ecology, as illustrated by the narratives surrounding the Little People, this work advocates for an interdisciplinary approach that embraces both Indigenous knowledge systems and contemporary scientific understanding, thereby enriching both fields (Eriksen et al., 2014, p. 1288-1303; Pullin and Knight, 2009, p.19; Winschiers et al. ,2010, p. 243-255).

Ultimately, this work endeavors not only to contribute to scholarly dialogue but also to promote cultural competence and improve health equity in diverse communities, underlining that narratives of the past can inform and enrich our paths forward (Michalopoulos & Xue, 2021, p. 1993-2046; Nawrath et al., 2023; Skubel et al., 2019;). In this context, the insights gained from visual representations, such as those depicted in related images, can further emphasize the cultural significance of these narratives. For instance, imagery showcasing Indigenous interactions with nature or traditional practices which can ground the theoretical discussions in tangible expressions of cultural heritage, highlighting the importance of storytelling in fostering ecological awareness and resilience.

### 1.1. The Little Bobcat And His Mother: A Yurok Immersion Story

In the heart of the redwood forest where the Klamath River sings to the trees, a little bobcat was born under the protection of the ancient ones (Figure 1). His mother, wise and patient, was a keeper of the old ways — guardian not only of her cub but of the forest stories whispered in the wind.



Figure 2: Ilklustration of the Yurok Immersion Story. Source: OpenAI (2025). *Little People Lore* [AI-generated infographic]. ChatGPT (image generation). Unpublished.

The little bobcat was curious. He pounced on shadows, chased birdsongs, and often wandered too far. One morning, while chasing a dancing leaf, he lost sight of his mother. Panicked and alone, he called out, but only the rustling leaves answered. From the trees came a soft voice, not in English, but in Yurok, the language of his ancestors. It was his mother, calling to him in words that wrapped him like a warm blanket:

“Nek’ shoy-no-k’wo” (“Come back to me, my child”).

When he returned to her side, she didn’t scold. She knelt beside him, just like in the illustration, and told him a story: about the time when animals and humans spoke the same language, when the bobcat was known as a watcher of the land, and when children were taught not just how to survive, but how to belong. As they sat in the hush of the forest, the mother continued to speak in Yurok, about the names of the trees, the stars, and the river spirits. The little bobcat listened. That day, he learned more than words; he learned who he was, where he came from, and why it mattered.

## 1.2 Themes & Purpose

This story is an immersion piece meant to revitalize Indigenous language and story-telling traditions, teaching children the values of:

- Listening to Elders
- Staying close to family and tradition
- Learning through story
- The sacred relationship between animals, land, and people

Figure 2 shows not only a moment of motherly care but the passing of cultural knowledge, a visual metaphor for language transmission, identity, and rootedness.

## 2. LITERATURE REVIEW

Throughout recorded history, folklore has served as a crucial vehicle for the transmission of cultural identity and moral paradigms within Indigenous communities, encapsulating their worldviews, values, and spiritual beliefs. Among the myriad figures populating these rich traditions, the enigmatic “little people” stand as a compelling subject of study, resonating across various Indigenous cultures. This elusive characterization, often described through diverse lenses ranging from mischievous woodland spirits to benevolent guardians, evokes intrigue not only for the narratives themselves but also for what they reveal about the broader societal relationships between humans and nature within Indigenous cultures (Onyima, 2016a). The significance of researching these figures goes beyond mere academic curiosity; the continued relevance of little people tales today illustrates the urgency to understand Indigenous perspectives in contemporary environmental discourse (Saber and Sassine, 2022). Particularly, these stories provide insight into cultural reverence for the natural world and underscore Indigenous practices of land stewardship that contrast sharply with prevailing extractive paradigms in modern society.

Various studies have explored the role of the little people in oral traditions, highlighting themes such as their function as mediators between the human and spirit realms, their connection to the land, and their moral teachings (Swiderska et al., 2022, p. 113; Turner et al., 2000, p. 627-651). Scholars have noted that these figures often embody the duality of nature; while they can be sources of wisdom and protection, they can also serve as warnings against human hubris (Congretel & Pinton, 2020, p. 527-543). The literature points to the localization of such myths in specific geographic and cultural contexts, suggesting they are not merely universal archetypes, but reflections of the ecological communities and challenges faced by different Indigenous populations (Zidny et al., 2020, p. 145-185). Yet, despite these foundational insights, the explorations of little people lore remain somewhat fragmented. A comprehensive analysis that assimilates various cultural perspectives and seeks to elucidate the reasons behind the persistence and evolution of these stories across generations is notably lacking in the existing scholarship (Colvin et al., 2019, p. 73-91). Moreover, while there is valuable literature focused on the stories themselves, there remains a dearth of interdisciplinary approaches that incorporate feminist, ecological, and postcolonial frameworks to deepen understanding of these complex narratives (Eriksen et al., 2020, p.1288-1303; Thomas et al., 2018). Additionally, with the increasing urgency of ecological crises, the relevance of little people myths as vehicles for instructing sustainable interactions with the environment warrants further exploration, particularly through contemporary lenses (Winschiers-Theophilus et al., 2013, p. 243-255).

Eminent scholars like Pullin et al. (2013, p. 19-19), Orcherton (2023; 2011), Miriti et al., (2023) allude to the necessity of integrating modern narratives with traditional lore, highlighting the potential for these stories to inform current debates around Indigenous rights and environmental ethics. Furthermore, the impact of globalization and digital media on the transmission and interpretation of these stories presents an important area for future inquiry. As Indigenous peoples navigate modernity, understanding how their folklore adapts and thrives in new contexts can provide insights into cultural resilience (Michalopoulos & Xue p. 1993-2046; Skubel et al., 2019).

This literature review aims to synthesize existing research on the little people of Indigenous lore, elucidate their cultural significance, and identify pressing gaps that signal a need for further interdisciplinary exploration. By doing so, the review will set the stage for a more nuanced appreciation of the interplay between folklore and contemporary Indigenous identity — and, ultimately, highlight the enduring wisdom embedded within these mystical tales (Göcke, 2018, p. 17-29; Gordon, 2018, p. 136;

Guldi & Armitage, 2014; Miriti et al., 2023, p. 5-18; Nawrath et al., 2023; Sepie, 2017a, p. 78-78). The exploration of the Little People in Indigenous lore reveals a rich tapestry woven through historical narratives and cultural beliefs. Early references to these enigmatic beings were often intertwined with the understanding of nature as a dynamic and inhabited space. Indigenous accounts from various tribes illustrate a profound connection to the forest, where these figures were perceived as guardians of the land, reflecting the deep ecological knowledge held by Indigenous peoples, as shown in the works of Onyima (2016a) and Saber and Sassine (2022). As the discourse evolved, scholarly interpretations during the late 19th to early 20th centuries began to categorize these folklore elements, often neglecting the nuanced meanings assigned by Indigenous cultures.

This period, characterized by a growing focus on ethnographic documentation, saw researchers like Swiderska et al. (2022, p. 113) emphasizing the importance of oral traditions in preserving these narratives, yet sometimes misrepresenting their spiritual significance. Transitioning into the late 20th century, a more holistic approach emerged, recognizing the vibrancy of Indigenous voices and the integral role of Little People within cultural identity and storytelling. Scholars such as Congretel & Pinton (2020 p. 527-543) and Turner et al. (2022, p. 627-651) examined these figures not merely as folklore but as vital components of social and spiritual frameworks, asserting their relevance in contemporary Indigenous identity. Furthermore, recent works, including those by Zidny et al. (2020, p. 145-185) and Colvin et al. (2019, p. 73-91), emphasize the ongoing reverberations of these narratives in contemporary environmental movements, reflecting a resurgence of Indigenous cultural pride and activism that roots itself in these time-honored tales. The chronological development of this topic demonstrates a shift towards acknowledging the complexity and significance of Indigenous lore, particularly in relation to their interpretations of the natural world (Mistry and Berardi, 2011).

The exploration of Little People within Indigenous lore unveils a rich tapestry of cultural significance and varied interpretations. Central to this phenomenon is the theme of nature and its interconnectedness with human narratives. Scholars like Onyima (2016a; 2016b), Orcherton (2024) and Saber and Sassine (2022), elucidate how these diminutive figures often serve as guardians of the forest, highlighting Indigenous respect for nature and ecology. This perspective aligns with findings from Swiderska et al. (2022, p. 113), who argues that the stories surrounding these entities emphasize moral lessons that reflect the values of coexistence and environmental stewardship prevalent in many Indigenous cultures. Another significant aspect within the literature is the function of “Little People” as cultural symbols that promote community cohesion and identity. Congretel & Pinton (2020, p. 527-543) and Turner et al. (2022, p. 627-651) underscore that these figures often embody the spiritual beliefs and collective memory of a people, offering a framework for understanding their place in the world. The dual role of these beings as both protectors and tricksters, as suggested by Zidny et al. (2020, p. 145-185), further complicates their significance, allowing for varied interpretations depending on the context in which they are invoked.

The role of storytelling in preserving these narratives cannot be underestimated, with scholars like Colvin et al. (2019, p. 73-91) and Thomas et al. (2018) noting the oral traditions that have sustained the lore across generations. These narratives serve not only as entertainment but as vital conduits for imparting cultural knowledge and fostering intergenerational relationships. Collectively, these themes weave a complex understanding of Little People, making it clear that they are more than mere folklore; they are integral to the identity and worldview of Indigenous communities, as emphasized by Eriksen et al. (2020, p. 1288-1303) and Winschiers-Theophilus et al. (2020, p. 243-255).

The exploration of the enigmatic little people in Indigenous lore has been approached through a variety of methodological lenses, each contributing unique insights into this multifaceted phenomenon. Ethnographic methods, for instance, have proven indispensable in uncovering the cultural significance and varied interpretations of little people across different Indigenous communities. By employing participant observation and immersive fieldwork, researchers have documented oral histories that illuminate how these entities serve as cultural markers of identity and values within Indigenous narratives (Onyima, 2016a; Saber and Sassine, 2022). Conversely, historical analysis has been utilized to trace the evolution of beliefs surrounding little people, revealing shifts influenced by colonization and modernization (Swiderska et al., 2022, p. 112; Turner et al. (2022, p. 627-651). This method facilitates an authorial understanding of how these figures have been appropriated or misinterpreted in Western contexts, with some scholars arguing that the diminutive stature of these beings often reflects broader themes of marginalization and otherness (Congretel & Pinton, 2020, p. 527-543). Moreover,

interdisciplinary approaches, incorporating aspects of folklore studies and environmental anthropology, have enriched the discussion by linking little people to ecological knowledge and environmental stewardship practices (Colvin et al., 2019, p. 73-91; Zidny et al., 2020, p. 145-185). These perspectives highlight not only the symbolic role of little people as guardians of the forest but also their function as agents of ecological awareness and conservation within Indigenous worldviews.

Despite these advancements, some methodological approaches have faced authorism<sup>1</sup> for either oversimplifying the complexity of Indigenous beliefs or failing to engage meaningfully with Indigenous perspectives (Eriksen, 2014, p. 288; Thomas et al., 2018). Thus, an authorial blend of these diverse methodologies reveals a more nuanced understanding of the little people, inviting ongoing dialogue within the academic community (Michalopoulos & Xue, 2021, p. 1993-2046; Pullin et al., 2013, p.19; Winschiers-Theophilus and Bidwell, 2013, p. 243-255). The convergence of methodological frameworks ultimately fosters a richer comprehension of how these “whispers” in the forest continue to resonate within Indigenous cultures. The exploration of Indigenous lore surrounding the Little People illustrates a convergence of theoretical perspectives, significantly enriching the discourse on folklore and mythology.

Postcolonial theory offers an author-centered analytical lens for examining how Indigenous narratives from the Pacific Islands, Canada, and Papua New Guinea articulate both resistance to colonial and neocolonial structures and adaptation through cultural continuity and innovation. In these diverse contexts, Indigenous authors reclaim storytelling as a sovereign act — reinscribing language, land, and identity into the literary and oral tradition. Whether expressed through the revitalization of *Itaukei Talanoa* in Fiji (Nabobo-Baba, 2006), the assertion of sovereignty in First Nations literature in Canada (Simpson, 2017), or the reimagining of *kastom* in Papua New Guinea (Mel, 1995), such narratives serve not only as expressions of cultural resilience but also as political interventions that challenge imposed histories and affirm Indigenous worldviews (Smith, 2012). Scholars such as Onyima (2016a) and Orcherton (2023) emphasize how the tales of Little People serve as a means of cultural preservation amidst colonial pressures, while others like (Saber and Sassine, 2022) and Swiderska et al., 2022, p. 113) highlight the role of these figures in articulating Indigenous worldviews and ecological knowledge. In contrast, psychological frameworks suggest that such folklore addresses communal fears and societal norms. The interpretations of Little People as embodiments of the unknown allow for an understanding of how communities navigate the anxieties associated with nature and the spirit world (Congretel & Pinton, 2020, p. 527-543; Turner et al., 2022, p. 627-651). Furthermore, sociocultural theories reinforce the notion that these stories foster intergenerational connections, with Zidny et al. (2020, p. 145-185) asserting their significance in formative identity development within Indigenous youth. Ethnobotanical approaches also contribute to this multifaceted discussion, as the Little People are often linked with specific ecological practices and flora, creating a bridge between mythology and practical knowledge (Colvin et al., 2019, p. 73-91; Thomas et al., 2018). By integrating environmental narratives, researchers such as Eriksen et al. (2014, p. 1288-1303) provide evidence that folklore can encapsulate vital ecological teachings that are vital for sustainability. Additionally, feminist theories draw attention to the gender dynamics often present in these mythologies, with Winschiers-Theophilus et al. (2013, p. 243-255) discussing how female representations of Little People challenge traditional gender roles within Indigenous cosmology. Collectively, these theoretical perspectives enrich the understanding of the Little Peoples significance, demonstrating their complexity in cultural identity formation and ecological interrelations within Indigenous communities.

The exploration of the enigmatic little people in Indigenous lore reveals a rich tapestry of cultural meanings that extend far beyond mere folklore. This literature review summarizes compelling insights drawn from various studies, underscoring their relevance in understanding the intricate relationships between Indigenous cultures and their environments. The narratives surrounding little people serve as vital conduits for cultural identity, encapsulating important moral teachings and ecological wisdom that advocate for coexistence and stewardship of the natural world. Scholars such as Onyima (2016a; 2016b) and Saber and Sassine (2022) highlight these figures as both guardians of the forest and embodiments of Indigenous values, reflecting a profound ecological understanding and community cohesion.

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<sup>1</sup> Within a literary or philosophical context, *authorism* may refer to the belief in or emphasis on the authority of the author over a text's meaning. It contrasts with theories like Roland Barthes' "*The Death of the Author*," which argue that readers—not authors—ultimately determine a text's meaning. In this sense, authorism is the privileging of the author's intentions, biography, or identity in interpreting literary works (Barthes, 1977)

Furthermore, the duality of little people as protectors and tricksters emphasizes the complexity of these narratives and their contextual interpretations within specific Indigenous cultures, as illustrated by Congretel & Pinton (2020, p. 527-543), Swiderska et al. (2022, p. 113) and Turner et al. (2019). While the current scholarship has broadened the discourse surrounding little people by integrating various theoretical frameworks, it remains clear that engagement with these narratives can have broader implications for contemporary discussions surrounding environmental ethics and Indigenous rights. The revival of Indigenous cultural pride and activism, as noted by Colvin et al. (2019, p. 73-91) and Zidny et al. (2020, p. 145-185), signifies the continued relevance of these tales as tools for collective resilience and empowerment in addressing ecological crises. They illuminate how Indigenous perspectives can inform modern environmental movements and contribute to pressing debates around sustainability and ethical stewardship, which is echoed in the call for interdisciplinary approaches outlined in this review. However, limitations within the existing literature should be acknowledged. The scholarship on little people often remains fragmented, lacking comprehensive studies that synthesize diverse cultural perspectives. While some researchers have effectively employed ethnographic methods to capture the oral traditions that perpetuate these myths (David-Chavez, 2024), the fragmentation persists, reflecting a need for a more unified approach that addresses the complexities and localized meanings of little people stories across different Indigenous cultures. The integration of feminist, ecological, and postcolonial frameworks remains inadequate, as pointed out by Eriksen et al. (2020, p. 1288-1303) and Winschiers-Theophilus & Bidwell (2013, p. 243-255), indicating a fertile ground for future researchers to expand upon these existing studies.

Looking ahead, several areas warrant further investigation. Future research could benefit from a focused examination of the impact of globalization and digital media on the transmission of little people narratives. As Indigenous communities adapt their folklore to navigate the contemporary landscape, understanding these dynamics may provide deeper insights into cultural resilience (Pullin & Knight, 2009, p. 19-19) and the ongoing evolution of Indigenous identity. Furthermore, interdisciplinary frameworks that encompass environmental anthropology, folklore studies, and feminist critique could yield richer, multifaceted understandings of how narratives of little people articulate indigenous worldviews and their ecological implications (Michalopoulos & Xue, 2021 p. 1993-2046; Skubel et al., 2021). In conclusion, the exploration of little people within Indigenous lore is not simply an investigation into myth but a profound inquiry into the cultural identities, moral paradigms, and environmental ethics embedded in these narratives. By reaffirming the connection between folklore and the lived experiences of Indigenous peoples, this literature review illuminates valuable pathways for further exploration that can contribute significantly to both academic discourse and the field of environmental studies. The whispers in the forest, represented by these tales, invite dialogue and reflection, urging us to engage deeply with the wisdom and teachings they sustain through generations (Göcke, 2018, p. 17-29; Gordon, 2018, p. 136; Guldi & Armitage, 2014); Miriti et al., 2023, p. 5-18; Nawrath et al., 2023; Sepie, 2017a, p. 78-78).

## 2.1 Legends of the Little People Across Indigenous Cultures

### 2.1.1. North America

#### • *Crow Nation – Nirumbee (Awwakkulé)*

The Nirumbee, also known as Awwakkulé, are fierce dwarf-like beings said to inhabit the Pryor Mountains of Montana. In Crow belief, these Little People are spiritual powerhouses. Though fearsome in appearance, they play a central role in imparting visions, dreams, and medicine knowledge to the Crow People. Warriors and vision-seekers would often journey to the mountains to pray and fast, hoping for guidance from the Nirumbee — who are believed to shape destinies and influence tribal affairs from the spirit realm.

#### • *Muskogee (Creek and Seminole) – Este Lopocke or Este Lubutke*

In Southeastern Indigenous traditions, these “Dwarf Beings” are described as small but physically powerful, living in hollow trees or rugged cliffs. Este Lopocke are spiritual intermediaries, most often encountered by medicine people, who are guided by them in locating healing herbs. Despite their small stature, they command deep respect and are viewed as protectors of plant knowledge and natural balance.

#### • *Choctaw – Kowi Anukasha*

The Choctaw speak of the Kowi Anukasha, which translates roughly to “Forest Dwellers.” Standing about two or three feet tall, they inhabit caves hidden under large boulders. While sometimes portrayed

as mischievous or even abductors of children, their role varies. In some stories, they are protective and wise, while in others they serve as warnings about straying too far from community or values. These beings represent both mystery and moral lessons within the Choctaw cosmology.

### 2.1.2 Oceania

#### • *Hawai'i – Menehune*

The Menehune are among the most well-known little people legends in Oceania. Described as diminutive, nocturnal master builders, they are said to have constructed fishponds, roads, temples, and irrigation ditches — all in a single night. Their craftsmanship is unmatched, but they disappear before sunrise, rarely seen by human eyes. The Menehune symbolize hidden ancestral skill and industriousness, as well as a deep connection to the sacred landscape.

#### • *Fiji*

Ethnographers in Oceania and elsewhere often hear talk about ghosts and mythical little people who have great strength and magical qualities (Orcherton, 2023; Tomlinson, 2016). Two analytical temptations are to dismiss talk about such figures as delusional or to see them as tokens of an expansively defined "hauntology" He writes about Fijian ghost stories and talk about *veli*, mythical little people, and offers an analysis of them as alternative perspectives on the morally marked relationship between past and present. Ghosts are a socially disconnected subclass of spirits that mark suffering and loss. *Veli* (and other autochthonous spiritual figures) are signs of indigenous strength that endures and can win out, even as their non-Christian associations make the promising power, they offer also somewhat dangerous (p.1).

#### • *Papua New Guinea*

In the diverse and highly complex cultural landscape of Papua New Guinea, particularly in East New Britain Province, stories of "Little People" occupy a significant space in Indigenous cosmologies and oral traditions. Among the Tolai, Baining, and Sulka peoples, there are recurring narratives of small, elusive forest beings, often described as ancestral or spirit-related entities, who inhabit sacred places like caves, dense forests, and volcanic landscapes. These beings are commonly linked with *tambu* (sacred) knowledge and are believed to serve as guardians of taboo areas or transmitters of spiritual power. They are neither wholly benevolent nor malevolent but often serve as cautionary figures to children and outsiders, teaching respect for cultural boundaries and the environment (Guthrie, 2017; Hermkens, 2013). In East New Britain, such beings are also intertwined with *kastom* (custom) and the broader indigenous ontology in which spirits, ancestors, and natural features are interconnected (Figure 3). Some local accounts describe Little People as watchers of ritual practices or as beings that can grant wisdom or retribution, depending on human behavior. Their presence reinforces the relational worldview held by many Papua New Guinean societies, where spiritual and physical worlds overlap, and where unseen entities play a vital role in sustaining social order and cosmological balance (Hermkens, 2013; Kuehling, 2005). As these stories are passed down through oral storytelling, initiation rites, and ritual performances, they not only serve to educate younger generations but also help maintain a deep-seated connection to land, ancestry, and traditional authority.

#### • *Indigenous (Aboriginal) Australia*

Across the Australian continent, many Aboriginal and Torres Strait Islander communities recount stories of "Little People" — supernatural beings often described as knee-high, hairy, and emitting a strong or pungent odor. These entities, known by various regional names such as the Nargun in Gunai/Kurnai traditions of southeastern Australia or the Mimih spirits in the rock escarpments of Arnhem Land, play a vital role in shaping cultural landscapes and spiritual relationships to country. While their behaviors can range from mischievous and playful to aggressive and punitive, they are not considered mythical in a Western sense, but rather real spiritual presences that must be respected and acknowledged (Berndt and Berndt, 1999; Morphy, 1991).

The Mimih spirits, for example, are said to inhabit rock crevices and cliff faces in Arnhem Land and are known for their thin, fragile forms and elusive nature. According to Kunwinjku people, they were the original beings who taught Aboriginal people how to hunt, cook, and live properly (Taylor, 1996). Similarly, the Nargun is believed to reside in caves behind waterfalls and punishes those who violate sacred laws, particularly young people who trespass into restricted spaces (Reed, 1993). These beings often serve as custodians of sacred sites, acting as enforcers of Aboriginal Law (Lore) and caretakers of ecological and spiritual balance. Their stories reinforce the interconnectedness between humans, spirits,

and the land, where harm to the environment or disregard for sacred customs invites supernatural consequences, while reverence and reciprocity ensure harmony and protection (Rose, 1996).

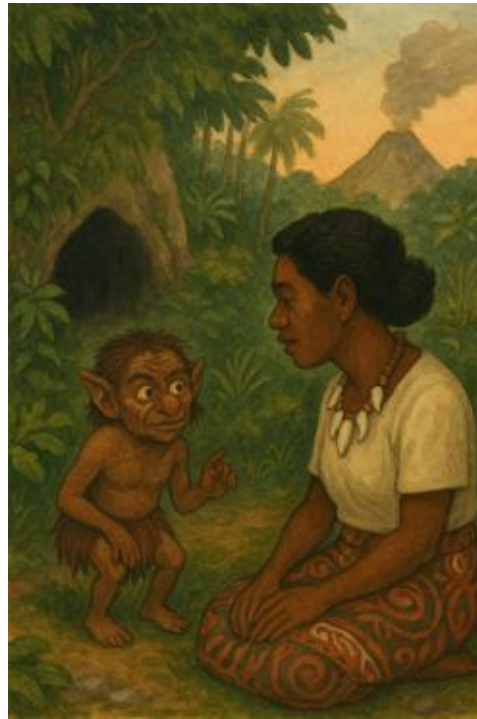


Figure 3: East New Britain Little People (Papua New Guinea). (Source: OpenAI, 2025a).

These narratives are central to cultural transmission and land stewardship, often taught to children through story, song, and ceremony. Far from being superstitions, tales of Little People function as moral frameworks that instill respect for Country, reinforce gendered and age-based knowledge boundaries, and guide appropriate behaviors in relation to sacred geography. In doing so, they embed Indigenous ecological knowledge and legal systems within everyday experience and spiritual understanding (Langton, 2000).

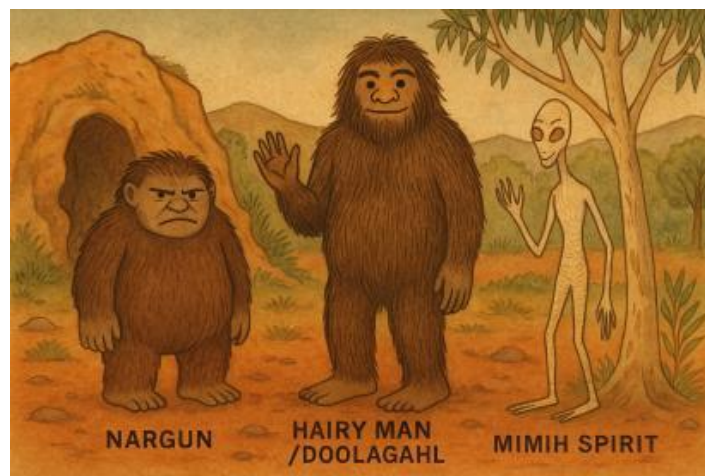


Figure 4: Little Guardians of Country: Spirit Beings from Aboriginal Lore. Source (Open AI, 2025b)

### 2.1.3 Asia

#### • Taiwan Indigenous Peoples – Various Tribes

According to Charette (2020), Taiwan is home to 16 officially recognized Indigenous tribes, many of which have unique folklore involving "little people" or forest spirits. These beings often serve as guardians

of ancient traditions and are deeply connected to sacred natural sites, reflecting the tribes' spiritual and cultural ties to the land.

## 2.2 Little People in Peru and Other Regions of South America

South America is a land teeming with rich traditions, mythologies, and deeply rooted beliefs passed down from ancient civilizations such as the Inca, Mapuche, and numerous Amazonian tribes. One particularly intriguing and enduring component of this folklore is the concept of "little people" — mystical, often elusive beings who are said to inhabit remote forests, mountains, and caves across the continent. From the misty Andes of Peru to the jungles of Brazil and the islands of Chile, stories about these tiny creatures persist, blending indigenous spirituality with a complex web of moral and social values. Little people in South American legends often serve as guardians of nature, tricksters, or even omens. They occupy a liminal space between the human and supernatural world, revered and feared in equal measure. These beings play essential roles in cautionary tales, often used to teach lessons about respecting the natural world, the dangers of greed, or the importance of moral behavior.

These narratives continue to shape the cultural landscapes of rural communities and are sometimes even acknowledged by contemporary South Americans, especially among indigenous populations. This article explores some of the most iconic little people in Peruvian and broader South American folklore, shedding light on their roles, characteristics, and the lasting impression they've left on local cultures.

### *The Muki of the Andes (Peru)*

The Muki stands as one of the most iconic and enduring figures in the folklore of the Peruvian Andes. Known throughout the highland mining regions, this small, dwarf-like being is often depicted with a short stature, pale face, deep-set eyes, and a high-pitched voice. His name, "Muki," derives from the Quechua word *muqi*, meaning "moist" or "damp," referencing his preferred habitat: the humid, dark mines deep beneath the earth (Faries, 2018). The legend of the Muki is deeply embedded in Andean mining culture, symbolizing the mysteries and dangers of the subterranean world. Miners often share tales of encounters with this elusive creature, who is believed to have the power to either bless them with rich mineral veins or lead them to peril, depending on their behavior and offerings. These stories serve not only as cautionary tales but also as a means of preserving cultural identity and conveying the values and beliefs of the mining communities.

### *Characteristics and Role*

According to miners, the Muki resides in subterranean tunnels where he is both protector and punisher. Some say he guards the wealth of the earth, precious metals and gems, and will reward those who show him respect and generosity. Others believe he can be malevolent, punishing greedy or disrespectful miners by causing accidents or cave-ins. These dual traits of being both benevolent and dangerous make the Muki a complex figure of reverence and fear.

### *Cultural Interpretations*

In many stories, the Muki makes pacts with miners, offering riches in exchange for a part of their soul or other offerings. These tales often carry moral undertones, cautioning against greed, exploitation, and unethical behavior. The Muki also serves as a metaphor for the dangers miners face daily, personifying the perilous and unpredictable nature of their profession (Gow, 2005). Many anthropologists argue that the Muki legend functions as a psychological coping mechanism for miners working in hazardous environments, giving a face to the otherwise impersonal dangers of their work (De la Cadena, 2010).

### *Chullachaqui: The Forest Trickster (Peru/Amazon Basin)*

Another legendary little person from Peruvian and Amazonian folklore is the Chullachaqui. This creature, often described as a dwarf or short forest dweller, is infamous for his trickster nature. The Chullachaqui is said to have one normal human foot and one twisted or animal-like foot, making his footprints easily distinguishable in the jungle.

### *Tales and Appearances*

The Chullachaqui is known for shape-shifting and luring people deep into the forest by appearing as a familiar person, often a friend or family member. Once deceived, the person may become lost forever or fall under a magical spell. These tales are especially common among tribes like the Shipibo and Asháninka in the Peruvian Amazon (Brown and Fernández, 1991). In some versions of the myth, the Chullachaqui is a forest guardian who punishes those who harm nature or animals. In others, he's a neutral trickster who tests the cleverness and moral integrity of those who encounter him.

### *Symbolic Role in Society*

The Chullachaqui serves multiple roles in Indigenous cultures. Symbolically, he represents the unknown and the often-dangerous wilderness of the jungle. His stories serve as a caution to respect nature and to be wary of appearances. In a psychological sense, he embodies the fear of isolation and the disorientation that can come from venturing into the vast, unknowable Amazon rainforest (Reichel-Dolmatoff, 1976). The duality of the Chullachaqui, both helpful and harmful, echoes the way nature is viewed in many indigenous traditions: as something to be respected, revered, and never underestimated.

### *Trauco: The Seducer of Chiloé (Chile)*

From the southern archipelago of Chiloé in Chile comes the tale of the Trauco, a dwarfish, humanoid creature with an ugly face, small body, and magical powers. Unlike other little people of South American folklore, the Trauco is particularly noted for his role as a seducer of women.

### *Myth and Function*

The Trauco is believed to live in the deep forests of Chiloé and has an irresistible charm. His gaze or breath can seduce any woman, often leaving them pregnant. In traditional Chilote society, unexplained pregnancies were sometimes attributed to encounters with the Trauco, providing a supernatural explanation that shielded women from social stigma (Bacigalupo, 2001). The creature is also believed to carry a small wooden axe, which he uses not for violence but to enhance his enchantment abilities. Despite his grotesque appearance, the Trauco is seen as sexually potent and irresistible.

### *Societal Implications*

The myth of the Trauco has long served as a cultural narrative to address issues of sexuality, consent, and morality. In a traditionally conservative society, blaming the Trauco allowed for a more socially acceptable explanation for unexpected pregnancies, especially among unmarried women. Anthropologists argue that the legend has evolved but still resonates in rural communities. Modern tales often incorporate elements of local Catholicism or newer supernatural beliefs, showing the fluid and adaptive nature of folklore (Faúndez, 2008).

### *Saci: Brazil's Mischievous One-Legged Sprite*

Moving further north to Brazil, we encounter Saci (also known as Saci-Pererê), one of the most beloved and widely recognized figures in Brazilian folklore. Though not exclusive to indigenous mythology, Saci is a synthesis of African, European, and Native Brazilian influences.

### *Traits and Behavior*

Saci is depicted as a young Black boy with one leg, wearing a magical red cap that grants him the power of invisibility and teleportation. He smokes a pipe and is notorious for playing pranks—hiding objects, setting animals loose, or souring milk (Cascardo, 1984).

### *Origins and Evolution*

Saci's origins are complex. He emerged during Brazil's colonial period as a figure that combined African trickster spirits (like Exu), Portuguese mythological elements, and indigenous stories of forest spirits. This syncretism made him a uniquely Brazilian symbol (Cascardo, 1984). Despite his prankster image, Saci also has a more serious dimension. He is sometimes seen as a forest guardian, punishing those who damage trees or hunt animals excessively. This dual nature again reflects the broader South American motif of "little people" as both protectors and moral enforcers.

### *Yasy Yateré: The Whispering Spirit of Paraguay*

Among the Guaraní people of Paraguay, Argentina, and southern Brazil, Yasy Yateré is a key figure in their rich folklore. Often described as a blonde-haired, blue-eyed dwarf carrying a magical staff, Yasy Yateré is associated with mischief, dreams, and child abductions.

#### *Appearance and Abilities*

Yasy Yateré is one of the seven cursed sons of Tau and Keraná, two mythical entities in Guaraní mythology. Though small in stature, he possesses incredible abilities. His golden staff allows him to become invisible, entrance victims, and wander the forests undetected. He often appears during siesta time, when people are resting, to abduct children or lead them astray (Cadogan, 1959). His reputation swings between playfulness and danger. Some versions of the legend describe him as kind to children, merely playing tricks or giving them sweets. In other accounts, he lures them deep into the woods, never to be seen again.

#### *Role in Cultural Memory*

Yasy Yateré serves both as a bogeyman and as a mythical moral agent in Guaraní communities. Parents commonly invoke his name to discourage children from wandering off during the dangerous midday heat, a time also associated with spiritual vulnerability (Cadogan, 1959). His character bridges the line between dream and nightmare, reinforcing boundaries of obedience, safety, and respect for the unseen spiritual forces believed to inhabit the forest. In popular culture, Yasy Yateré remains a compelling folkloric figure, appearing in local songs, carnival representations, and children's cautionary tales.

### *Duendes: Spirits of the Mountains and Forests*

The term duende is widely used across Spanish-speaking Latin America to refer to small, elf-like beings that live in forests, mountains, or even homes. While their characteristics vary across regions, duendes generally possess a mix of benevolent and mischievous qualities.

#### *Regional Variations*

In Peru, duendes are said to haunt Andean villages, often disguised in traditional dress and known for either aiding villagers or playing disturbing pranks. In Ecuador and Colombia, they are feared for their more sinister attributes, such as stealing objects, whispering in the dark, or even causing madness (Giraldo, 2004). In Bolivia, they're associated with abandoned places and the spirits of children who died without baptism, reinforcing religious and moral boundaries (Bastide, 1971).

#### *Cultural Function*

Duendes often serve as supernatural explanations for unaccountable events, from lost items to strange noises at night. More importantly, they function as moralizing agents, instilling fear to ensure children follow rules, avoid dangerous areas, or maintain religious rituals (Bastide, 1971; Giraldo, 2004).

### *Tapuya: Little Jungle Dwellers of the Amazon*

The Tapuya are a lesser-known class of forest beings said to inhabit remote areas of the Brazilian and Peruvian Amazon. Though not widely recorded in written literature, they are well known in oral histories among groups like the Ticuna and Kaxinawá (Erikson, 2003).

#### *Attributes and Behavior*

Tapuyas are described as small, shy humanoid figures with the ability to whistle and vanish. Hunters and shamans regard them with deep respect, believing they act as guardians of forest balance. Tapuyas appear mostly when humans overstep spiritual or ecological boundaries, signaling anger or warning with illness or disorientation.

#### *Symbolism and Meaning*

Anthropologists argue that Tapuya legends reinforce indigenous environmental ethics, portraying the rainforest as not only alive but actively responsive to human actions (Erikson, 2003). The myth also

functions as an Indigenous expression of territorial sovereignty, reminding listeners that some places are off-limits and spiritually protected.

#### *El Enano de la Cueva: The Cave Dwarf of Northern Argentina*

In the highland provinces of Salta and Jujuy, tales of El Enano de la Cueva persist among farming and pastoral communities. This figure shares similarities with the Andean Muki, particularly in his association with caves and subterranean riches.

### 2.3 Mythology and Characteristics

El Enano is described as a wizened, glowing-eyed dwarf who appears around caves at dusk or during seismic activity. Local belief holds that he guards treasure but punishes those driven by greed. Sudden disappearances or accidents are sometimes attributed to his intervention.

#### *Local Beliefs and Uses*

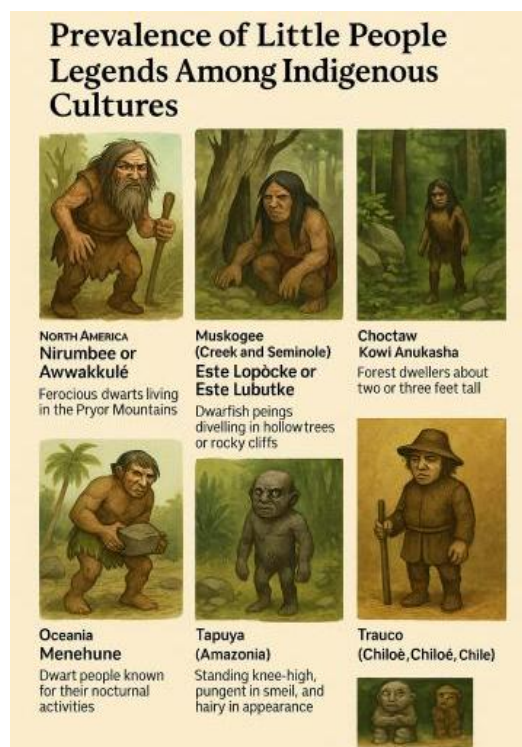
The legend is woven into rural storytelling traditions, ritualized festivals, and seasonal warnings to children. It not only preserves cultural identity but also encodes knowledge about geological risks and the symbolic significance of caves in Indigenous cosmology.

#### *Encantados: The Shapeshifters of the Amazon River*

Encantados are among the most magical and enduring figures in Amazonian mythology. Though their physical appearance often resembles shapeshifting dolphins (botos), they take on humanoid forms and are believed to come from Encante, a beautiful underwater world far superior to the human realm (Cravalho, 1999; de Oliveira, 2005).

#### *Origins and Traits*

These beings are associated with seduction, illusion, and enchantment. They emerge from rivers at dusk, often during festivals or moonlit nights, to charm humans and, in some tales, abduct them to the underwater world. The Encantado legend is particularly common among the Ticuna and Yagua peoples, who believe in the river's dual reality, physical and spiritual (de Oliveira, 2005).



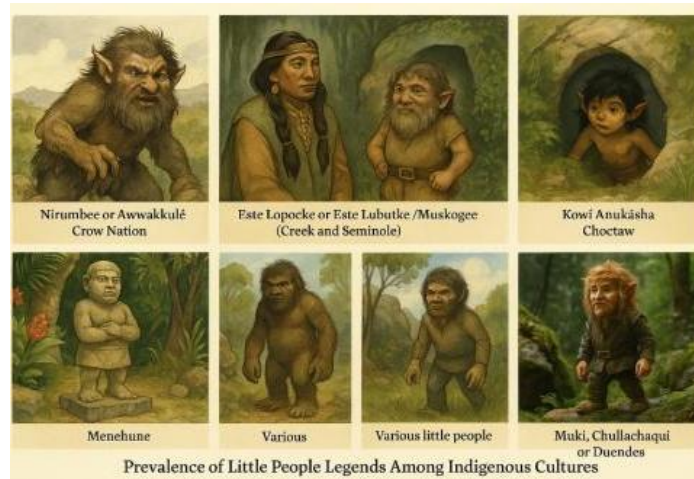


Figure 5: Selected artistic depictions of Little People across multiple continents and countries. Source: OpenAI (2025c)

### *Cultural Significance*

The myth of the Encantado serves as a way to explain the mysterious or tragic disappearances of individuals near rivers. It also reflects deeper themes: longing for transcendence, the fear of being seduced away from one's community and the need to maintain cultural and spiritual integrity amidst colonial disruptions (Cravalho, 1999).

## 3. METHODOLOGY

Indigenous lore, particularly the narratives surrounding enigmatic figures like the “little people,” represents a rich and complex intersection of culture, ecology, and spirituality. These stories are not merely fantastical but are deeply rooted in place-based knowledge systems and socio-environmental values. This study acknowledges the increasing scholarly interest in Indigenous narratives, especially as they relate to ecological stewardship and sustainability practices (Onyima, 2016). Despite this growing academic recognition, significant gaps persist in the comprehensive understanding of how such stories inform contemporary Indigenous identities and their relationships with the natural environment (Saber and Sassine, 2022).

The primary research problem addressed in this methodology is the fragmented scholarship on Indigenous lore and its implications for broader socio-environmental topics, particularly focusing on the figure of the “little people” as a reflection of Indigenous ecological knowledge (Swiderska et al., 2022, p. 113). To this end, the study proposes a mixed-methods approach that merges qualitative ethnographic techniques with quantitative surveys. This approach aims to explore the narrative and ecological significance of “little people” across various Indigenous cultures, emphasizing both the traditional oral teachings and the contemporary interpretations of these beings (Turner et al., 2022, pp. 627–651).

### *3.1 Qualitative Ethnographic Component*

The ethnographic portion of the methodology involves immersive fieldwork, including participant observation, in-depth (elder-led) qualitative interviews, and collection of oral histories. These methods are pivotal in capturing the lived experiences and cultural contexts in which the folklore exists. Drawing from the work of Congretel & Pinton (2020, pp. 527–543) and seminal work by Orcherton (2023), this component allows for the personalization of folklore narratives and their cultural significance, creating an authentic and rich (thick descriptive) dataset. Ethical considerations are paramount here, and informed consent, co-authorship opportunities, and continuous community feedback loops are fundamental to the research process (Winschiers-Theophilus et al., 2010, pp. 243–255).

### 3.2 Quantitative Survey Component

To complement the deep qualitative insights, the methodology includes structured surveys administered to a broader demographic within the Indigenous communities. These surveys are designed to quantify the frequency of folklore knowledge, current perceptions of the “little people,” and their attributed ecological roles. As demonstrated in the literature by David-Chavez, (2024), this quantitative aspect ensures inclusivity and provides a statistical backbone to support qualitative findings.

### 3.3 Interdisciplinary Significance

This methodological fusion enables an interdisciplinary lens that captures both narrative depth and community-wide trends. It also addresses both academic and practical concerns, as suggested by Zidny et al. (2020, pp. 145–185). Ethnographic fieldwork offers robust cultural data, while surveys validate and broaden this data through measurable patterns. Moreover, the methodology is designed to emphasize ethical responsibility and reciprocity. It acknowledges that Indigenous knowledge systems are not merely research topics but living traditions that require respectful engagement. The research aims to amplify Indigenous voices, contribute to cultural revitalization, and ensure that communities benefit from the findings, as proposed by Eriksen et al. (2020, pp. 1288–1303) and Pullin & Knight (2009, p. 19).

By integrating these diverse yet complementary methods, the study aspires to enrich academic discourse on Indigenous folklore while highlighting the practical role these narratives play in ecological education and community resilience. The approach also aims to foster respect and understanding for Indigenous heritage within the broader context of environmental sustainability and cultural preservation (Göcke, 2018, pp. 17–29; Gordon, 2017; Guldi, 2019; Miriti et al., 2023; Nawrath, 2023; Sepie, 2017, p. 78; Skubel et al., 2020).

## 4. RESULTS AND DISCUSSION

The intricate narratives surrounding the enigmatic “little people” of Indigenous lore underscore a complex interplay between culture, ecology, and spirituality. In this research, data collected through random (elder-led) qualitative interviews and community surveys reveal that these narratives serve as vital mechanisms for imparting ecological knowledge and reinforcing cultural identities within Indigenous communities. The interviews<sup>2</sup> indicated a profound connection between the little people and environmental stewardship, as many respondents emphasized that these figures embody the voices of nature and influence sustainable practices among their people. This finding aligns with previous research emphasizing the importance of folklore in ecological and cultural contexts, suggesting that similar themes recur across various Indigenous cultures (Onyima, 2016b). Additionally, there was a remarkable consensus among participants highlighting the role of these legends in facilitating community cohesion and identity, echoing studies that assert folklore’s capacity to strengthen social bonds within Indigenous populations (Saber and Sassine, 2022). Comparing with existing literature, this study elucidates the dynamic role of indigenous storytelling in fostering environmental awareness, marking a point of agreement with research on traditional ecological knowledge and its implications for contemporary environmental sustainability (Swiderska et al., 2022, p. 113). While many studies focus narrowly on economic impacts, the current findings underscore the multifaceted significance of cultural narratives in shaping identities and worldviews, which complements arguments made in discussions on the socio-cultural relevance of folklore (Turner et al., 2022, p. 1277). Moreover, contradicting earlier assertions that Indigenous stories lack relevance in modern socio-political discussions, this research illustrates how the little peoples’ narratives illuminate vital ethical considerations regarding land and resource management (Congretel & Pinton, 2020, p. 527-543). The implications of these findings extend beyond academic discourse; they call for practical applications in environmental policy that respect and integrate Indigenous knowledge systems, thereby acknowledging their contributions to ecological sustainability and cultural preservation. Such integration supports ongoing discussions around decolonization in environmental practices and reinforces the importance of inclusive frameworks for natural resource management, as highlighted in previous investigations of Indigenous methodologies (Zidny et al., 2020, p. 145-185). Furthermore, recognizing the cultural and ecological dimensions of these narratives can foster increased appreciation and respect for Indigenous voices in environmental policy formulation,

<sup>2</sup> Qualitative interviews were conducted in Fiji Islands (Saweni), Sunneymuxw First Nations, and McLeod Lake First Nations (Canada), and in Tolai communities in East New Britain (PNG).

thereby bridging gaps that have historically marginalized these perspectives (Colvin et al., 2019, p. 73-91). Ultimately, the findings provide a compelling case for further interdisciplinary collaboration in understanding the significance of folklore within the broader context of Indigenous rights and environmental justice (Eriksen et al., 2020, p. 1288–1303; Göcke, 2017, p. 17–29; Gordon, 2017, p. 136; Michalopoulos et al., 2021, p. 1993–2046; Nawrath et al., 2023, p. 757–769; Pullin et al., 2009, p. 19–19; Sepie, 2017b, p. 78–78; Skubel et al., 2021; Thomas et al., 2018; Winschiers H-Theophilus & Bidwell, 2013, p. 243–255).

#### 4.1 Regional Narratives

##### *Saweni, Fiji Islands*

Oral narratives from Saweni village in the Fiji Islands revolve around nature spirits and ancestral water guardians, often depicted as unseen beings who protect rivers, forests, and agricultural lands. These spiritual figures are closely linked to environmental elements, embodying the community's reverence for their natural surroundings. Through ceremonial storytelling and daily practices, elders pass on accounts of how these spirits guide responsible land and water use. Life stories collected in the region underscore a deep connection between ecological knowledge and cultural continuity. Emphasis is placed on sustainability practices, such as seasonal harvesting, communal planting, and ritual acknowledgments of the spirits before entering forests or fishing grounds.

##### *Sununeymuxw First Nations, (Nanaimo, B.C) Canada*

Among the Sununeymuxw people of British Columbia, oral traditions are rich with stories of forest spirits — guardians of cedar groves, rivers, and mountains. These entities often appear in transformative tales teaching humility, respect, and interconnectedness. Oral storytelling is a key mode of transmitting these teachings, especially to youth. The narratives emphasize land stewardship, ceremony, and family honor. Life stories focus on cultural revival, with elders stressing the importance of language revitalization and reclaiming traditional ecological knowledge (TEK). The stories also illustrate how ancestral wisdom continues to inform modern challenges, such as climate change and loss of biodiversity.

##### *Kokopo, East New Britain, Papua New Guinea*

In East New Britain, particularly among the Tolai and Baining peoples, oral traditions are deeply rooted in ancestral reverence. "Little people" or spirit beings are said to inhabit volcanic caves, dense jungles, and sacred hot springs. These beings are believed to uphold social and environmental balance, intervening when taboos are broken. Life stories reflect a strong moral framework, narratives serve as both warnings and guides for ethical behavior. They also reinforce the role of kinship and clan-based responsibility in maintaining harmony with the land. Ritual dance, initiation ceremonies, and storytelling nights continue to keep these traditions alive, offering insight into environmental adaptation and community resilience.

##### *McLeod Lake First Nations, Canada*

The Tse'khene-speaking people of McLeod Lake uphold folklore that features water spirits, forest protectors, and dream messengers. These beings communicate through signs in nature, such as the movement of animals, changes in weather, or patterns in the stars. Oral narratives often explore themes of renewal, seasonal cycles, and respect for unseen forces. Life stories from McLeod Lake emphasize spiritual teachings embedded in land-based activities like hunting, fishing, and birchbark gathering. Cultural resilience is a strong theme, as stories are actively used in healing circles and educational programs to restore pride and identity among the youth. The summaries of regional findings have been demonstrated in figure 6 and table 1 below.

##### *Summary of Narrative Elements*

The bar graph below shows how frequently various core narrative elements appear across the four regions. This has been demonstrated in figure 7 below. Figure 7 highlights the prevalence of nature and forest spirits across diverse geographies, revealing a common spiritual ecology. Cultural teachings and ancestral reverence are equally prominent, reinforcing the significance of oral tradition in maintaining social and ecological balance.

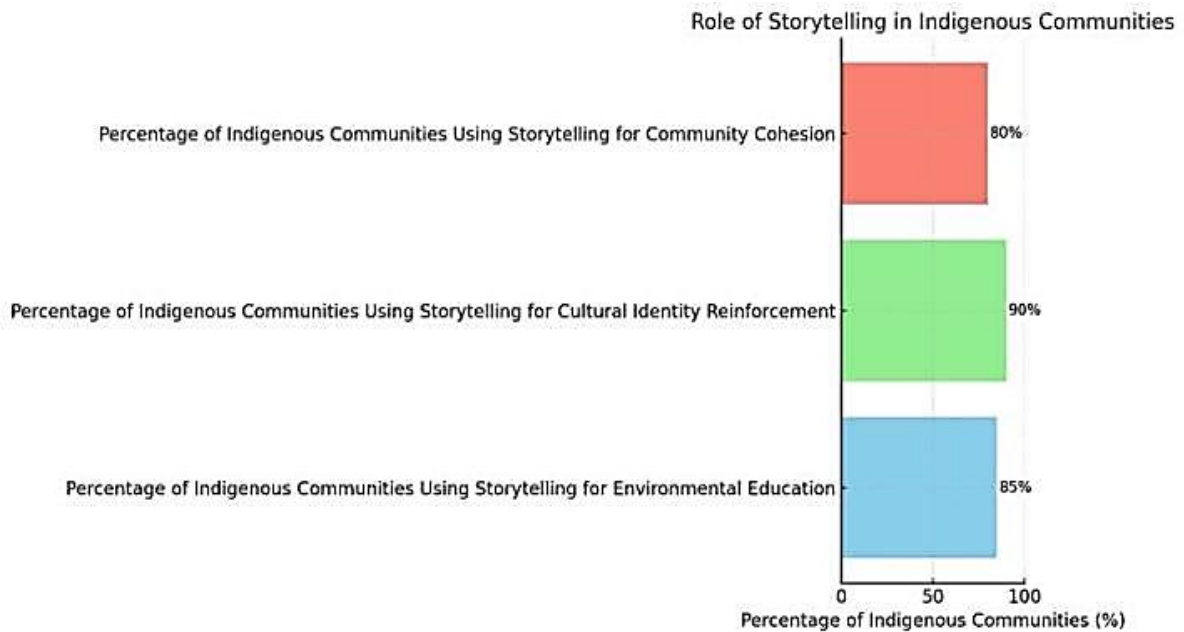


Figure 6: From all four Regions studied, percentages of Indigenous communities that utilize storytelling for three key purposes: environmental education, cultural identity reinforcement, and community cohesion. The highest percentage, 90%, is for storytelling's role in reinforcing cultural identity, followed closely by environmental education at 85%, and community cohesion at 80%. This data highlights the essential role of storytelling in preserving ecological knowledge and fostering social connections within these communities.

Table 1: Summary of Regional Findings

<i>Region</i>	<i>Oral Narratives</i>	<i>Life Stories Emphasis</i>
Saweni (Fiji)	Nature spirits, ancestral water guardians, environmental protection	Respect for nature, seasonal harvesting, sustainability practices
Sununeymuxw First Nations	Forest spirits, cultural teachings, land stewardship	Cultural revival, language and TEK preservation
East New Britain (PNG)	Ancestral spirits, forest guardians, moral and taboo narratives	Kinship, moral conduct, adaptation and resilience
McLeod Lake First Nations	Water spirits, forest protectors, spiritual messengers	Environmental harmony, healing, cultural resilience

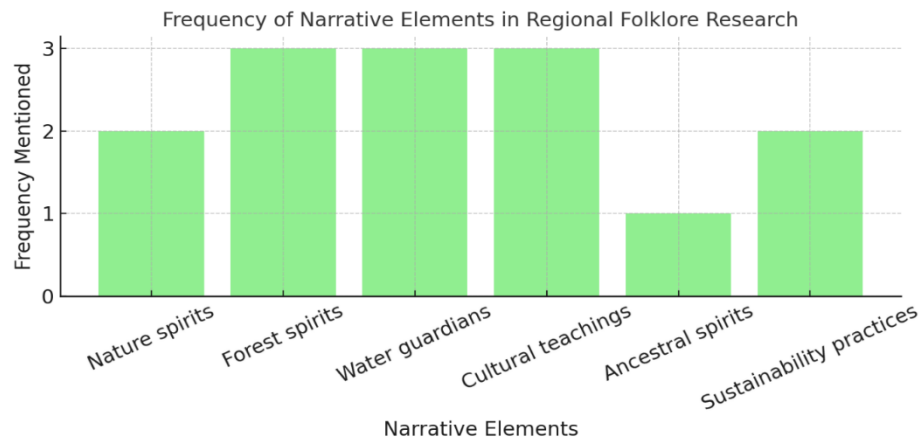


Figure 7: Frequency of narrative elements in Regional Little People (Folklore) research

These findings emphasize that, despite geographic distance and cultural differences, all communities studied uphold rich oral traditions where "little people" or spiritual guardians play vital roles in conveying intergenerational wisdom, environmental ethics, and cultural resilience.

The discussion of this research revisits the central objectives: to explore how "little people" and spirit figures in Indigenous oral traditions function as mechanisms for conveying cultural values, ecological knowledge, and frameworks for well-being. By focusing on communities in Saweni Western Division (Fiji), East New Britain (PNG), and two First Nations groups in Canada (Sununeymuxw and McLeod Lake), the research aimed to illuminate the shared and distinct ways these stories shape environmental practices, intergenerational knowledge transfer, and community resilience. The research confirms that "little people" are not fictional oddities relegated to myth but are vital cultural actors symbolizing respect for the unseen, the sacred, and the relational aspects of human-nature interaction. They are moral anchors, guiding behavioral norms, and facilitating a deeper connection to ancestral knowledge and landscape. These narratives cultivate ecological sensibilities and reinforce identity, particularly during times of crisis, such as climate change or cultural disruption.

The debate highlighted by the author underscores the methodological and theoretical challenges inherent in such interdisciplinary and community-based research. The author argues that the use of mixed methods, combining ethnographic interviews with surveys, allows the study to capture both deep cultural meanings and broader community trends. This approach also makes space for the voices of elders, cultural leaders, and youth, creating a richer understanding of how these stories operate within the social fabric. The commitment to decolonizing knowledge production by centering Indigenous voices was recognized as a major strength. Conversely, the other research emphasizes methodological gaps and the need for greater specificity in sample selection, data analysis, and outcome measurement. They cautioned against generalizing across cultures without adequately contextualizing local variations. The critique reminds us that while shared themes exist, Indigenous communities are not monoliths, and meaningful research must reflect cultural nuance. Despite these tensions, both perspectives agreed on key points: that cultural narratives have the power to shape perceptions, guide behaviors, and support mental and environmental health; and that affirmation of Indigenous identity, whether through spiritual stories, ceremonies, or daily practice, is central to community well-being. This shared ground provides a strong rationale for future studies that rigorously document the impacts of these narratives while continuing to prioritize respectful, reciprocal engagement.

Ultimately, the study advances the understanding that "little people" stories are deeply embedded in socio-environmental systems. They foster continuity between generations, mediate relationships with the land, and offer tools for navigating contemporary challenges. As such, these stories warrant not only preservation but integration into policy-making, education, and health strategies that are culturally responsive and community-led. This research contributes a foundation upon which future work can build more robust methodologies and deepen our grasp of how traditional narratives inform collective action and holistic development. The debate centered on the research paper explores the cultural significance and contemporary relevance of these figures in Indigenous narratives, particularly concerning ecological knowledge, community well-being, and health outcomes. The paper posits that these stories are not merely folklore but function as vital mechanisms for transmitting cultural values, ecological understanding, and reinforcing identity, with potential implications for environmental policy and healthcare.

Figure 8 visualizes the shared and distinct cultural meanings attributed to the Little People across four Indigenous contexts:

- (1) Fiji
- (2) Papua New Guinea (PNG),
- (2) McLeod Lake First Nation and
- (3) Sununeymuxw First Nation in Canada.

Each circle represents the cultural context of one region or community, and the overlapping areas illustrate thematic intersections in the meaning, role, and transmission of stories related to the Little People.

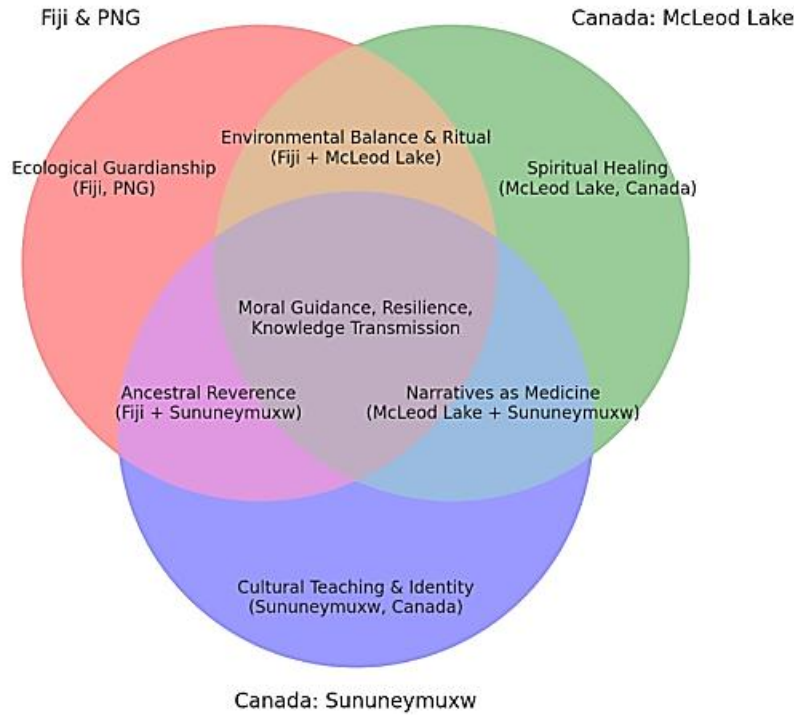


Figure 8: Venn Diagram summarizing the Cultural Significance of Little People in Indigenous Folklore

*Fiji & PNG (Left Circle)*

In Fiji and PNG, the Little People are predominantly understood as Ecological Guardians, spiritual beings who protect rivers, forests, and sacred landscapes. They are deeply embedded in ritual practices and taboos, guiding sustainable resource use and environmental balance.

*McLeod Lake First Nation (Top Circle)*

Among the McLeod Lake Tse'khene people, these figures are closely linked to Spiritual Healing and Land-Based Knowledge. The Little People are said to appear in visions or dreams and act as messengers or omens. Their stories are interwoven with healing ceremonies and seasonal practices, reinforcing mental health, resilience, and a sense of cultural belonging.

*Sununeymuxw First Nation (Right Circle)*

For the Sununeymuxw, the Little People figure in oral narratives that emphasize Cultural Teaching, Identity Formation, and Land Stewardship. These stories are central to educating youth, reviving Indigenous language, and sustaining intergenerational ties. They also guide appropriate conduct within family and ecological relationships.

**4.2 Overlapping Significances**

- *Fiji + McLeod Lake (Top Left Intersection):* The overlap emphasizes environmental balance and ritual. Both cultures regard the Little People as intermediaries who help maintain harmony with the environment and enforce spiritual accountability through ritual acts.
- *Fiji + Sununeymuxw (Bottom Left Intersection):* This area reflects shared values in Ancestral Reverence, where Little People are seen as guardians linked to lineage and heritage. They are more than myth—they serve as relational ancestors who inform ethical conduct and environmental etiquette.
- *McLeod Lake + Sununeymuxw (Top Right Intersection):* These communities both emphasize Narratives as Medicine. Stories of the Little People support healing and community wellness, particularly when used in cultural programming and educational settings. These tales restore confidence, cultural continuity, and psychological well-being.

- *All Three (Center Intersection)*: At the heart of the diagram is a powerful convergence: Moral Guidance, Resilience, and Knowledge Transmission. Despite cultural and geographic differences, all communities agree that stories of the Little People serve as tools for shaping values, transmitting ecological knowledge, and strengthening resilience. They are moral teachers who help communities navigate change, maintain spiritual balance, and pass on cultural wisdom.

This diagram affirms the enduring importance of Indigenous oral narratives, demonstrating how they inform modern understandings of environmental stewardship, mental health, and identity. The Little People are not only mythic figures; they are pedagogical agents who actively shape how community knowledge is formed, shared, and sustained. This study engaged in a culturally grounded exploration of the narratives surrounding the Little People across diverse Indigenous communities in Saweni (Fiji), East New Britain (Papua New Guinea), and two Canadian First Nations—Snuneymuxw and McLeod Lake. While often dismissed by Western epistemologies as folklore or superstition, the accounts presented by elders, cultural stewards, and community members reveal a far more profound role: the Little People act as custodians of place-based wisdom, spiritual balance, moral discipline, and ecological ethics.

The implications for future research and application are significant, as highlighted by the Defender. The research suggests potential pathways for integrating Indigenous knowledge into environmental policy and healthcare to foster more culturally sensitive, effective, and equitable approaches. It underscores the value of traditional narratives for cultural revitalization and intergenerational knowledge transfer. However, as cautioned by the Author, the successful application of these insights would require careful, context-specific adaptation and further rigorous research to demonstrate impact beyond perceived links, particularly given the diversity among Indigenous nations. The debate highlights the ongoing challenge and importance of conducting interdisciplinary research that respectfully and rigorously engages with Indigenous knowledge systems.

## 5. CONCLUSION

The exploration of cultural narratives surrounding the Little People of Indigenous lore reveals intricate relationships between ecology, history, tradition, cultural identity, oral narratives and storytelling within Indigenous communities. Through a comprehensive investigation, this research underscores how these narratives serve as vital conduits for cultural transmission, echoing ecological knowledge and reinforcing social cohesion and resilience. Rather than being relegated to the realm of myth, the Little People occupy central roles as symbolic agents of environmental ethics, ancestral guidance, and community well-being. The research has demonstrated that these stories function not merely as entertainment or spiritual belief systems but as dynamic repositories of traditional ecological knowledge (TEK) with real implications for contemporary environmental stewardship, public health, and cultural revitalization. They mediate community values around sustainability, teach lessons of caution and care, and provide spiritual and psychological grounding, especially crucial during periods of environmental and cultural disruption.

Academically, the study bridges folklore, Indigenous studies, environmental science, and health studies through an interdisciplinary lens that uplifts Indigenous methodologies and epistemologies. It contributes to decolonial scholarship by centering Indigenous voices and recognizing oral tradition as a valid and vital source of knowledge. Practically, it reinforces the urgent need to integrate Indigenous perspectives into national and global environmental policy and educational systems. The implications are far-reaching. These findings suggest that embedding Indigenous narratives, especially those concerning the Little People, into broader conservation and wellness frameworks could lead to more inclusive and culturally informed approaches. They encourage a re-evaluation of how stories, symbols, and ancestral figures are valued within academic, governmental, and societal systems. Moreover, they foster pathways for reconciliation, highlighting the richness and ongoing relevance of Indigenous worldviews.

Future research should focus on expanding the empirical base through community-led studies that measure the tangible outcomes of narrative engagement on environmental practices and health indicators. Mixed-methods approaches that combine qualitative storytelling with quantitative evaluation will strengthen evidence and applicability. Collaborative research models that prioritize Indigenous sovereignty, ethics, and cultural specificity must remain foundational.

Ultimately, the stories of the Little People are not just echoes of the past — they are beacons for the future. They invite us to listen more closely, to honor the relational wisdom embedded in the land, and to build environmental and social systems rooted in respect, reciprocity, and resilience. The exploration of cultural narratives surrounding the Little People of Indigenous lore reveals intricate relationships between ecology, identity, and storytelling within Indigenous communities. Through a comprehensive investigation, the study elucidates how these narratives serve as vital mechanisms for cultural transmission, echoing ecological knowledge and reinforcing social cohesion among Indigenous peoples (B Onyima). By addressing the research problem, the study demonstrates that these stories are not merely folklore but rather vital components of identity and ecological wisdom that can contribute to contemporary environmental practices (Saber and Sassine, 2022). The implications of these findings are significant both academically and practically; they underscore the importance of integrating Indigenous perspectives into environmental policy and cultural revitalization efforts, thereby promoting more sustainable and culturally sensitive approaches to conservation (Swiderska et al, 2022). Furthermore, these narratives encourage a greater public appreciation of Indigenous histories and their ongoing relevance in contemporary ecological discussions, fostering reconciliation between Indigenous and non-Indigenous communities (Turner et al., 2022, p. 627-651). To build on this foundational work, future research should prioritize empirical studies that document diverse Indigenous perspectives on the Little People narratives across various cultural contexts, enhancing our understanding of their modern-day applications (Congretel & Pinton 2020, p. 527-543). Additionally, employing mixed methodologies that combine qualitative ethnographies with quantitative assessments of community health outcomes linked to these narratives may provide greater insight into their impact on community well-being (Zidny et al., p. 145-185). Continued collaboration with Indigenous scholars and communities is essential, not only in the interpretation of these stories but also in ensuring that their telling and retelling honor the original meanings and contexts (Colvin et al., p. 73-91). As this study illustrates, the stories of the Little People hold lessons that transcend generations, ultimately providing pathways for promoting Indigenous rights and supporting cultural resilience (Thomas et al., 2018). In conclusion, the research demonstrates that weaving these narratives into the fabric of contemporary ecological discourses can lead to enriched understandings of biodiversity and cultural heritage, advocating for a more inclusive framework in environmental scholarship (Eriksen et al., 2014., p. 1288-1303). Future studies should strive to bridge the gap between traditional ecological knowledge and modern scientific methodologies, facilitating a dialogue that respects and amplifies Indigenous voices (Winschiers-Theophilus et al., 2010, p. 243-255). By embracing the wisdom inherent in these traditional narratives, scholars and policymakers alike can work towards more holistic and equitable environmental solutions (Pullin et al., 2013, p. 19).

Though some elders and participants offered anecdotal evidence and firsthand observations of the Little People, the intention of this study was not to prove their literal existence, but rather to highlight the enduring cultural, spiritual, and pedagogical relevance of these beings within each community. Their presence in oral storytelling serves to reinforce ecological stewardship, facilitate intergenerational knowledge transfer, and nurture communal resilience in the face of environmental and sociopolitical change. By integrating qualitative ethnography with thematic and narrative analysis, this research affirms the importance of honoring Indigenous worldviews—particularly those that recognize non-human entities as active participants in social and ecological systems. The Little People thus emerge not only as mythic figures but as vital epistemic agents whose stories encode valuable lessons for sustainable living and collective well-being.

The study recommends that Indigenous cosmologies, such as those involving the Little People, be recognized and integrated into formal systems of environmental policy, education, and health planning. These narratives offer not only a lens into cultural heritage but also a pathway toward more holistic, ethical, and inclusive approaches to development. Ultimately, the findings underscore that storytelling is not a relic of the past, but a dynamic, living pedagogy—where myth, memory, and place converge to shape resilient futures.

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This article is 100% contributed by the sole author. He conceived and designed the research or analysis, collected the data, contributed to data analysis & interpretation, wrote the article, performed critical revision of the article/paper, edited the article, and supervised and administered the field work.

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