

Gender-Responsive Climate Action within the Sustainable Development Goal Framework

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Abstract

Climate change is not gender-neutral in its causes or consequences. Women and girls, particularly in developing and climate-vulnerable regions, experience disproportionate impacts due to socio-economic inequalities, limited access to resources, and underrepresentation in decision-making. Despite growing recognition within the Sustainable Development Goals (SDGs)—especially SDG 5 (Gender Equality) and SDG 13 (Climate Action)—gender considerations remain inadequately integrated into climate policies and actions. This study addresses the research problem of insufficient empirical understanding of how gender-responsive climate action contributes to sustainable development outcomes.

The study adopts a quantitative panel research design, using secondary data from 110 countries spanning 2000–2023. Data were sourced from UNDP Gender Inequality Index (GII), World Bank World Development Indicators, UN SDG Database, and ND-GAIN climate vulnerability indicators. Statistical techniques include descriptive analysis, correlation analysis, multiple regression, and moderation analysis to examine the relationship between gender inequality, climate vulnerability, and climate action outcomes.

The findings reveal that higher gender inequality is significantly associated with greater climate vulnerability and weaker climate adaptation capacity. Conversely, countries with stronger gender-responsive institutions and policies demonstrate improved climate resilience and SDG performance. The core implication is that gender equality is a critical enabler of effective climate action. Integrating gender perspectives into climate governance enhances adaptive capacity, promotes social equity, and accelerates progress toward multiple SDGs.

Keywords: Gender-Responsive Climate Action, SDG 5, SDG 13, Gender Inequality, Climate Vulnerability, Sustainable Development.

1. Introduction

Climate change represents one of the most pressing global challenges of the 21st century, affecting ecosystems, economies, and human well-being. However, its impacts are unevenly distributed across populations, with women and marginalized groups often bearing a disproportionate burden. Gender roles, access to resources, employment patterns, and social norms significantly influence exposure, sensitivity, and adaptive capacity to climate risks.

The 2030 Agenda for Sustainable Development explicitly recognizes gender equality as both a fundamental human right and a catalyst for sustainable development. SDG 5 seeks to achieve gender equality and empower all women and girls, while SDG 13 calls for urgent action to combat climate change and its impacts. These goals are deeply interconnected: gender inequality undermines climate resilience, while climate impacts exacerbate existing gender disparities.

Despite policy commitments such as the UNFCCC Gender Action Plan, gender considerations are often treated as peripheral rather than integral to climate policy design and implementation. Climate strategies frequently overlook women's knowledge, leadership potential, and role in adaptation and mitigation. This gap is particularly pronounced in developing economies, where women are highly dependent on climate-sensitive sectors such as agriculture, water collection, and informal labor.

This study seeks to empirically examine the relationship between gender inequality and climate action outcomes, emphasizing the importance of gender-responsive approaches within the SDG framework. By adopting a cross-country, longitudinal perspective, the research contributes to evidence-based policymaking on inclusive and effective climate action.

2. Literature Review

2.1 Gender Dimensions of Climate Change

A substantial body of literature highlights that climate change affects women and men differently due to socio-economic and cultural factors (IPCC, 2022). Women often have limited access to land, finance, education, and decision-making platforms, constraining their ability to adapt to climate shocks. Studies show that women are disproportionately affected by climate-induced displacement, food insecurity, and health risks (Neumayer & Plümper, 2007).

2.2 Gender Equality and Adaptive Capacity

Gender equality enhances adaptive capacity by improving access to resources, education, and political participation. Countries with higher female labor force participation and representation in governance tend to exhibit stronger environmental performance and disaster preparedness (Ergas & York, 2012). Gender-inclusive institutions facilitate community-based adaptation and knowledge sharing.

2.3 Gender and the SDG Framework

The SDG framework emphasizes interlinkages among goals, particularly between SDG 5 and SDG 13. Gender-responsive climate policies contribute to progress on SDGs related to poverty reduction (SDG 1), health (SDG 3), clean energy (SDG 7), and reduced inequalities (SDG 10). However, research indicates that national SDG implementation often lacks gender-disaggregated indicators and monitoring mechanisms.

2.4 Research Gap

- Limited empirical cross-country studies linking gender inequality with climate vulnerability and climate action outcomes
- Insufficient quantitative evidence on gender as a moderator of climate resilience
- Weak integration of SDG 5 into climate policy evaluation

2.5 Problem Statement

Despite global commitments to gender equality and climate action, gender considerations remain insufficiently integrated into climate policies, limiting their effectiveness and sustainability.

2.6 Research Questions

- How does gender inequality influence climate vulnerability and resilience across countries?
- What is the relationship between gender-responsive governance and climate action outcomes?
- How does gender equality contribute to achieving climate-related SDGs?

3. Research Methodology

3.1 Research Objectives

- To examine the impact of gender inequality on climate vulnerability and adaptation capacity.
- To assess the role of gender-responsive governance in climate action effectiveness.
- To analyze gender equality as an enabler of SDG-aligned climate outcomes.

3.2 Research Hypotheses

- **H1:** Higher gender inequality is associated with greater climate vulnerability.
- **H2:** Gender-responsive governance positively influences climate adaptation capacity.
- **H3:** Gender equality moderates the relationship between climate exposure and climate resilience.

3.3 Research Design

The study employs a quantitative longitudinal panel research design using country-level secondary data.

Table 1: Research Design Overview

Aspect	Description
Approach	Quantitative, panel study
Unit of Analysis	Countries
Sample Size	110 countries
Time Period	2000–2023
Analytical Tools	Descriptive, regression, moderation analysis

3.4 Sample and Sampling Technique

A purposive sampling technique was used to select countries with consistent data availability on gender inequality, climate vulnerability, and SDG indicators.

Table 2: Regional Distribution of Sample

Region	Number of Countries
Africa	30
Asia	28
Latin America	18
Europe	22
Others	12

3.5 Data Collection Methods

Secondary data were collected from:

- UNDP Gender Inequality Index (GII)
- World Bank World Development Indicators
- ND-GAIN Climate Vulnerability Index
- UN SDG Global Database

3.6 Measurement Instruments

Variable	Measurement Source
Gender Inequality	Gender Inequality Index (GII)
Climate Vulnerability	ND-GAIN Index
Climate Resilience	Adaptive Capacity Score
Climate Policy	Climate Policy Stringency Index
Governance	World Governance Indicators

3.7 Variables and Operationalization

Variable Type	Variable	Operational Definition
Independent	Gender Inequality	GII score (higher = more inequality)
Dependent	Climate Vulnerability	ND-GAIN vulnerability score
Mediator	Adaptive Capacity	ND-GAIN adaptive capacity
Moderator	Governance	WGI composite index
Control	GDP per capita, education	Socioeconomic indicators

3.8 Data Analysis Techniques

- Descriptive statistics
- Pearson correlation analysis
- Multiple linear regression
- Panel regression with fixed effects
- Moderation analysis

3.9 Ethical Considerations

The study relies exclusively on publicly available secondary data. Ethical research standards were upheld regarding transparency, citation, and interpretation.

4. Data Analysis and Results

4.1 Descriptive Statistics

Variable	Mean	SD
Gender Inequality Index	0.42	0.15
Climate Vulnerability	51.7	13.6
Adaptive Capacity	50.3	12.8

Climate Policy Index	47.9	18.2
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4.2 Correlation Results

Gender inequality shows a positive correlation with climate vulnerability ($r = .54, p < .01$) and a negative correlation with adaptive capacity ($r = -.48, p < .01$).

4.3 Regression and Hypothesis Testing

Model 1: Gender Inequality → Climate Vulnerability

- $\beta = 0.36, p < .001$
- $R^2 = 0.41$

Model 2: Gender Equality → Adaptive Capacity

- $\beta = -0.33, p < .01$
- $R^2 = 0.46$

Model 3: Moderation Analysis

- Gender Equality × Governance → Climate Resilience
- $\beta = 0.21, p < .05$

Hypothesis Results:

Hypothesis	Result
H1	Supported
H2	Supported
H3	Supported

5. Findings and Discussion

The findings confirm that gender inequality significantly exacerbates climate vulnerability, validating feminist political ecology perspectives. Gender-responsive governance enhances climate adaptation outcomes by improving access to resources, participation, and institutional

effectiveness. The results highlight strong synergies between SDG 5 and SDG 13, reinforcing the argument that gender equality is not merely a social goal but a climate imperative.

6. Conclusion

6.1 Summary of Findings

- Gender inequality increases climate vulnerability.
- Gender-responsive governance strengthens adaptive capacity.
- Gender equality accelerates SDG-aligned climate outcomes.

6.2 Theoretical Implications

The study contributes to climate-gender literature by empirically demonstrating gender equality as a determinant of climate resilience within the SDG framework.

6.3 Policy Implications

1. Integrate gender analysis into national climate strategies.
2. Promote women's participation in climate governance.
3. Strengthen gender-disaggregated SDG monitoring systems.

6.4 Limitations

- Country-level data mask local gender dynamics.
- Limited causal inference due to observational design.

6.5 Future Scope

Future research should explore sub-national gender-climate interactions, qualitative case studies, and sector-specific analyses.

6.6 Recommendations

- Mainstream gender budgeting in climate finance.
- Expand education and leadership opportunities for women in climate sectors.

- Strengthen international cooperation on gender-responsive climate action.

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