Diana Carolina Monroy Morera's Academic Portfolio

This portfolio showcases Diana Carolina Monroy Morera's expertise in carbon accounting, decarbonization pathway development, and climate adaptation research. Her work employs rigorous analytical approaches to Colombian carbon emission contexts, advancing carbon budget modeling. She integrates fairness qualifications into global decarbonization strategies. Her research provides comprehensive insights into sustainable development and environmental policy, demonstrating a commitment to robust, impactful climate solutions.

by Carolina Monroy

Diana Carolina Monroy Morera: Carbon Accounting & Climate Research

Diana Carolina Monroy Morera specializes in carbon accounting and climate research. Her work emphasizes rigorous environmental analysis and advanced carbon budget modeling.

Academic Credentials

MSc in **Sustainable Development** (University of Graz, Hiroshima University, Stellenbosch University). Her master's research focused on carbon accounting and decarbonization pathways, integrating environmental science with socio-economic factors for policy and sustainable development.

- **Biomimicry Training:** MCI Innsbruck.

Core Research Expertise

- Carbon Budget Modeling for Decarbonization Pathways
- Sectoral Carbon Allocation Analysis
- Climate Change Risk Assessment and Adaptation
- Complex Adaptive Systems in Carbon Emission Contexts
- Environmental Impact Assessment & LEED Certification
- Colombian Decarbonization Pathways
- Renewable Energy Potential Analysis

Research Impact and Publications

Diana's work, particularly in Colombian carbon emission contexts, includes published experimental findings on carbon budget fairness conditions and complex adaptive systems applications. Her research provides insights into climate change adaptation, decarbonization strategies, and renewable energy potential within Colombia, advancing carbon accounting methodologies.

Academic Collaborations

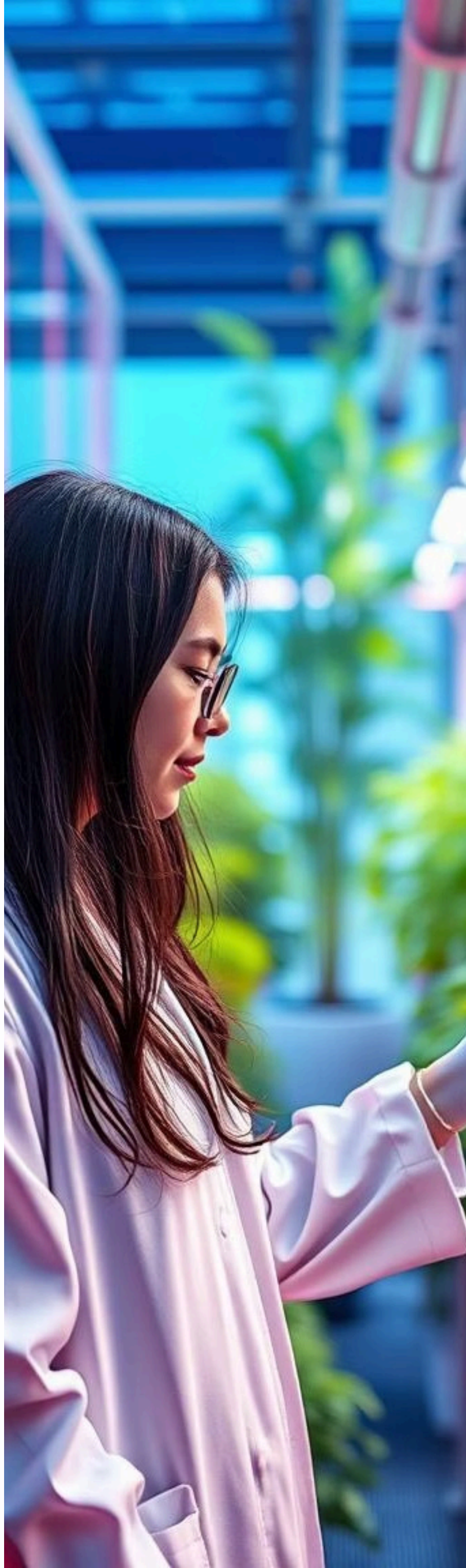
- Co-authored research with Keith Williges on Colombian decarbonization pathways.

Research Metrics

- 6 Publications
- 41 Reads
- 0 Citations

Languages

- Spanish (native)
- English (C1)
- German (A2)



Carbon Accounting & Decarbonization

Diana Carolina Monroy Morera integrates rigorous carbon accounting with advanced decarbonization methodologies. Her work develops robust, nature-inspired frameworks for environmental and sustainability challenges.

Methodological Contributions

Her research applies biomimicry principles. It derives sustainable carbon accounting and decarbonization strategies from ecological systems, enhancing climate mitigation efficiency.

Key Research Areas

Advanced Carbon Budgeting

Develops and refines models for sectoral carbon allocation and decarbonization pathways, focusing on equitable distribution and complex adaptive systems.

Climate Risk Analysis

Assesses climate change risks and designs adaptation strategies. Transforms complex environmental data into actionable insights.

Sustainable Development Metrics

Researches the efficacy of environmental impact assessment tools and sustainability certifications (e.g., LEED) within development contexts.

Renewable Energy Integration

Analyzes renewable energy potential and its systemic integration into national decarbonization strategies, specifically for Colombia.

Research Methodology & Expertise

Diana Carolina Monroy Morera's research applies rigorous, innovative environmental science to carbon accounting. Her methodologies bridge scientific principles with actionable insights for sustainable development and climate action.

Carbon Accounting Methodologies

Diana's expertise includes advanced methodologies for accurate carbon emission quantification and management, serving diverse stakeholders:

Model-Based Scenario Frameworks

Develops scenario frameworks for sectoral carbon budgets, facilitating precise forecasting and strategic decarbonization planning.

Fairness Qualification Calculations

Pioneers fairness-integrated carbon allocation calculations. These address socio-economic equity in distributing carbon budgets and responsibilities.

Complex Adaptive Systems (CAS) Applications

Applies Complex Adaptive Systems (CAS) principles to analyze dynamic carbon emission contexts, providing holistic insights into emission trajectories and response mechanisms.

Social-Ecological Research Frameworks

Integrates social-ecological research paradigms to develop comprehensive climate response frameworks, recognizing human-ecosystem interdependencies in resilience.

Technical Skills & Tools

Proficient in essential analytical tools and technical skills for climate research and sustainable development consulting:

- **Carbon Budget Modeling and Allocation:** Designs and implements models for national and sub-national carbon budgets, including equitable allocation strategies.
- **Sectoral Emission Analysis:** Assesses greenhouse gas emissions across key sectors: energy, agriculture, industry, and transportation.
- **Climate Risk Assessment Methodologies:** Employs robust frameworks to identify, quantify, and prioritize climate-related risks for organizations and regions.
- **Environmental Impact Assessment (EIA):** Conducts comprehensive evaluations of projects to predict and mitigate environmental consequences.
- **LEED Certification and Urban Carbon Footprint Analysis:** Expertise in sustainable building standards and urban carbon footprint measurement and reduction.
- **Life Cycle Assessment (LCA):** Analyzes environmental impacts of products and services throughout their life cycle, from extraction to disposal.

Research Frameworks

Diana's work is grounded in robust research frameworks, promoting comprehensive and actionable outcomes:

- **Interdisciplinary and Transdisciplinary Approaches:** Integrates knowledge from environmental science, economics, sociology, and policy studies.
- **Systems Thinking for Carbon Emission Contexts:** Applies a holistic perspective to understand carbon emission systems, leading to effective interventions.
- **Fairness and Equity Considerations in Decarbonization:** Embeds justice and equity principles into decarbonization strategies, ensuring societal benefits from climate action.
- **Regional Climate Adaptation Strategies:** Develops localized, context-specific strategies for communities and ecosystems to adapt to climate change impacts.

Collaborative Research & Publications

A strong proponent of collaborative science, Diana engages in significant partnerships, enriching her research and extending its reach:

- **Co-Authored Publications with International Researchers:** Collaborates with global experts to produce high-impact research, advancing understanding of climate challenges and solutions.
- **Cross-Institutional Research:** Works with prestigious institutions, including the University of Graz and Keith Williges, pioneering Colombian decarbonization pathways and fostering global scientific exchange.

Diana Carolina Monroy Morera: Research Publications

Diana Carolina Monroy Morera (University of Graz) conducts research focused on carbon accounting. Her portfolio, comprising 6 publications and 41 ResearchGate reads, addresses sustainable development, environmental assessment, and energy policy. This overview highlights her key contributions, emphasizing core findings in carbon accounting and related research.

La Guajira Climate Change Risk and Adaptation

Date: Jan 2021

This research assesses climate vulnerability and regional adaptation strategies in La Guajira's carbon-intensive sectors. It identifies climate risks and proposes adaptation strategies to enhance regional resilience.

Fairness Condition in the Carbon Budget for Pathways in Colombia

Date: Feb 2021

This publication details lead research on qualified sectoral carbon budget identification for Colombian deep decarbonization. It develops a novel fairness methodology for equitable carbon allocation across sectors, ensuring just climate action.

Colombian Decarbonization Pathways - Complex Adaptive Systems

Date: Feb 2022

This advanced research applies Complex Adaptive Systems (CAS) principles to analyze Colombian carbon emission contexts. It contributes to a comprehensive Social-Ecological framework, addressing climate change through systems thinking for effective decarbonization.

Science and Technology for Sustainable Development

Date: Aug 2025

This work explores sophisticated carbon accounting methodologies and their application in scientific research for sustainable development. It bridges technological innovation with environmental stewardship, emphasizing carbon impact assessment.

Environmental Urban Assessment Kruidenbuurt

Date: Oct 2025

This comprehensive environmental assessment of an urban neighborhood integrates LEED certification principles and detailed carbon footprint analysis. It provides actionable insights for reducing urban environmental impact and promoting sustainable urban planning.

Energy Potential: Renewable Energy Potential

Date: Oct 2025

This research investigates significant carbon reduction potential through clean energy transition, focusing on various renewable energy sources. It quantifies renewables' role in achieving decarbonization goals and enhancing energy sustainability.

Key Methodological Contributions and Research Trends

1

Interdisciplinary Research Emphasis

Monroy Morera's research highlights the critical role of interdisciplinary and transdisciplinary approaches in complex sustainability challenges. Her work integrates diverse scientific and societal knowledge systems for comprehensive problem-solving and stakeholder collaboration. Methodological examples include Environmental Impact Assessment (EIA), SWOT analysis, and various participatory methods, as detailed in "Methods summary long.docx."

2

Advanced Methodologies Utilized

A range of advanced methodologies supports inter- and transdisciplinary problem-solving. These include Questionnaire design, System Dynamics modeling, Environmental Impact Assessment (EIA), Integrated Risk Management, Life Cycle Assessment (LCA), Mediation, Multi-Criteria Analysis (MCA), Future Workshops, Technology Assessment (TA), Material Flow Analysis (MFA), SWOT analysis, Formative Scenario Analysis, Delphi method, Multi-Attribute Utility Theory, Ecological footprint analysis, and various Group Techniques.

3

Sustainability and Climate Change Focus

Monroy Morera's academic portfolio emphasizes global sustainability and climate change imperatives. Key research areas include developing and applying carbon accounting frameworks, analyzing decarbonization pathways, and assessing climate vulnerability and adaptation strategies.

Climate Change and Sustainability Initiatives

Decarbonization Pathways Research

"Sustainability Challenge.docx" details a methodological approach for modeling sectoral carbon allocation within Colombia's diverse building sector. This framework informs the national decarbonization strategy.

Renewable Energy Policy Analysis

"Guajira Energy Mix.docx" comprehensively analyzes sustainable renewable energy policy. It assesses the substantial solar and wind potential in Colombia's La Guajira region, proposing policy recommendations and addressing implementation challenges.

Climate Science and Policy Awareness

"ECSCC Summary.docx" introduces the global climate system, highlighting IPCC findings. It outlines the European Union's ambitious emissions reduction targets: at least 55% by 2030 and net-zero by 2050.

Environmental Health and Epidemiology

The "Carolina-Monroy_R210041_COPD_Cross-sectional-study.pdf" details a cross-sectional study examining Chronic Obstructive Pulmonary Disease (COPD) among Bogotá's bike-taxi drivers. This research highlights the health impact of air pollution in a densely populated urban environment (21,000 residents per km²). Air pollution in Bogotá poses a significant environmental health threat, contributing to 14% of ischemic heart disease fatalities and 17.6% of COPD deaths.

1 ## High Population Density

Bogotá's population density of 21,000 people per km² amplifies public health concerns related to air quality.

2 ## Substantial Health Burden

Urban air pollution is responsible for 14% of ischemic heart disease deaths and 17.6% of COPD fatalities within the city.

3 ## Vulnerable Demographics

Bike-taxi drivers are identified as a particularly vulnerable cohort due to their continuous exposure to traffic-related air pollution.

Systems Thinking for Environmental Circularity Research

"Monroy_Defence.pdf" details a systems-based approach for integrating circularity principles into environmental research. It introduces a methodological framework designed to reframe complex environmental challenges, particularly for early-stage circular innovation investigations. The research establishes a 'Leverage Circularity Framework,' a systematic tool to identify challenges, formulate circular strategies, map systems, and pinpoint critical leverage points for systemic environmental transformation.

Advanced Research Seminars: Carbon Accounting and Sustainability

This document details specialized seminars on sustainability. They focus on advancing research methodologies in carbon accounting and reporting frameworks.

Seminar Objectives

These seminars advance academic and practical understanding of robust sustainability methodologies. They foster critical analysis of reporting standards and frameworks for environmental impact assessment.

Methodological Approach

Seminars employ a research-driven pedagogical approach, integrating theoretical frameworks with case studies. This analyzes complex sustainability challenges, emphasizing empirical research and methodological rigor in carbon accounting.

Key Seminar Topics

- Sustainability Accounting and GRI Frameworks
- Advanced Sustainability Reporting and Materiality Assessment
- Frameworks for Sustainable Business Model Transformation
- Quantitative Analysis of Sustainability Performance

La Guajira: Public Health and Sustainable Development

This report addresses challenges such as water scarcity and vector-borne diseases (Dengue, Zika, Chikungunya) in Colombia's La Guajira Department. It proposes an action plan to mitigate disease impact and advance sustainable development goals.

1

Vector Control

Reduce mosquito populations and prevent disease transmission.

2

Epidemiological Surveillance

Monitor disease patterns and outbreaks for rapid response.

3

Promotion and Prevention

Educate and engage communities to prevent disease spread.

4

Situation Room

Coordinate response, manage outbreaks, and implement interventions.

La Guajira faces significant challenges from prolonged droughts and climate change. Vector-borne diseases, such as Dengue, are a primary concern. The report identifies climate change, poverty, and inadequate basic services as contributing factors to disease outbreaks.

Sustainable Energy Frameworks in La Guajira

The "Guajira Energy Mix.docx" report outlines a sustainable renewable energy policy framework. It assesses La Guajira's solar and wind potential and analyzes related policy proposals and implementation challenges.

Resource Potential

La Guajira possesses substantial solar and wind energy potential, positioning it as an optimal region for renewable energy development in Colombia. This potential supports regional decarbonization efforts.

Policy Instruments

- Feed-in Tariff (FIT) mechanisms
- Tradable green certificates (TGC)

These instruments are proposed to incentivize renewable energy adoption and attract investment. They constitute critical components of a robust climate policy.

Implementation and Governance

Effective local community engagement and strategic infrastructure development are crucial for successful renewable energy deployment in La Guajira.

The report advocates for an integrated energy mix, leveraging wind and solar resources to optimize regional assets and enhance energy security within a climate change mitigation context.