May
2022

Higher Education Climate Action

in Latin America and the Caribbean

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Participating Institutions

Alexander von Humboldt University Corporation
National Directorate of Schools
EAP Zamorano
The College of Mexico
Agricultural and Industrial Technical School
ENGEN
Evangelical University of Goiás - UniEVANGÉLICA
Faculty of Medicine - Barceló Foundation
Federal University of Santa Maria
Latin American Faculty of Social Sciences (FLACSO-Argentina)
Latin American Faculty of Social Sciences (FLACSO, Ecuador)
Elias Pando Foundation
H. A. Barceló Foundation
University Foundation of the American Tropics
GGC
Unis Group
Higher Technological Institute of the East of the state of Hidalgo
National Polytechnic Institute
Technological Institute of Costa Rica
Technological Institute of Mexicali
Higher Technological Institute of Zacapoaxtla
Intenalco Higher Education
IP Culinary
Western Institute of Technology and Higher Studies, Jesuit University of Guadalajara
The Savannah
Pontifical Catholic University of Argentina
Pontifical Catholic University of Chile
Pontifícia Universidade Católica de Campinas
SEINE
Technological Institute of La Laguna
Tecnológico de Estudios Superiores de Chalco
Autonomous University of Chihuahua
UCA
University of the Latin American Educational Center
University of Medical Sciences
State University of Paraná
Ibero-American University
University Corporation “Minute of God”
National University of the Littoral
Inter-American Open University
Antonio Nariño University
Antonio Ruiz de Montoya University
Austral University of Argentina
Austral University of Chile
Autonomous University of Baja California Sur
Autonomous University of Bucaramanga
Autonomous University of Chiapas
Autonomous University of Chihuahua
Autonomous University of Chile
Autonomous University of Coahuila
Autonomous University of Guadalajara
Autonomous University of Manizales
Autonomous University of Nuevo León
Autonomous University of the West
Autonomous University of Santa Ana
Autonomous University of Santo Domingo
Autonomous University of Carmen
Autonomous University of the State of Hidalgo
Autonomous University of the State of Morelos
Metropolitan Autonomous University
Blas Pascal University
Bolivian Catholic University
Catholic Pontifical University of Valparaiso
Catholic University of El Salvador
Catholic University of the Most Holy Conception
Catholic University of Manizales
Catholic University of Cibao
Catholic University Redemptoris Mater
Central University of the East
CETYS University
Cooperative University of Colombia
Creative University
Technical Education Center
University of Antioquia
University of Chile
University of Cuenca
University of Guadalajara
University of the Coast
University of La Frontera
University of La Sabana
De La Salle University
University of Magallanes
University of Manizales
University of Oriente
University of Pamplona
University of Piura
University of Playa Ancha
University of San Buenaventura- Bogotá sectional
University of San Carlos de Guatemala
University of Tarapacá
University of the Southern Cone of the Americas
University of the Isthmus
University of Rosario
University of Salvador
Universidad del Valle
Universidad del Valle de Guatemala
University of the Valley of Puebla
Don Bosco University
EAFIT University
EARTH University
ECCI University
EIA University
Espiritu Santo University
Favaloro University
Francisco Gavidia University
Gestalt University
Universidad Hispanoamerican
Universidad Iberoamericana Mexico City
Universidad Iberoamericana UNIBE
Industrial University of Santander
San Isidro Labrador International University
José Matías Delgado University
La Salle University Mexico
Latin University of Costa Rica
Free University
Madero University

Marist University of Guadalajara
Major Diversity of San Simón
National Autonomous University of Mexico UNAM
National University of Asunción
National University of Colombia
National University of Engineering
National University of Quilmes
National University of San Martín UNSAM
National University of Tucumán
National University of the Northwest of the Province of Buenos Aires
Jorge Basadre Grohmann National University
ORT University Uruguay
Universidad Panamericana
Polytechnic University of Atlacomulco
Polytechnic University of Chiapas
Polytechnic University of Honduras
Polytechnic University of Otzolotepec
Polytechnic University of Querétaro
Polytechnic University of Santa Rosa Jáuregui
Polytechnic University of the State of Morelos
Pontifical Bolivarian University
Popular University of Caesar
San Francisco University of Quito
San Miguel Arcángel University of Honduras
Santo Tomás University
Scientific University of the South
21st Century University
Cadereyta Technological University
Technological University of Calvillo
Technological University of Ciudad Juárez
Technological University of Culiacán
Technological University of Honduras UTH
Technological University of Jalisco
Technological University of Pereira
Technological University of Salamanca
Technological University of San Miguel de Allende
Technological University of Chocó-Diego Luís Córdoba
Technological University of Cibao Oriental
El Retoño Technological University
La Salle University of Technology
Metropolitan Technological University
Universidad Veracruzana
Veritas University
University of Brasília
State University of Rio de Janeiro
State University of Tocantins
Federal University of Health Sciences of Porto Alegre
Federal University of Mato Grosso do Sul
Federal University of Sergipe
Methodist University of São Paulo
Universidade Paulista
University of Bridgeport
University of Campinas
University of San Carlos of Guatemala
University of Sao Paulo
USP
UTEC
UTHH

US Universities

Arizona State University
University of Texas Arlington
Barna Management School
Tennessee State University
University of Notre Dame
CATIE
University of Columbia

Glosario

- Higher Education Institutions (HEIs)
- Greenhouse Gases and Compounds (GyCEI)
- Sustainable Development Solutions Network (SDSN)
- Massive Open Online Course (MOOC)
- Carbon Disclosure Project (CDP)

Authors

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Preface

Scientists around the world are stating with ever growing clarity and urgency that climate change poses an existential threat to human civilization and that the window for reducing human-driven carbon emissions is closing quickly. As John Holdren famously said – "We have three choices: mitigation, adaptation, and suffering. We're going to do some of each. The question is what the mix is going to be."[1] In other words, the longer we wait to act, the more suffering we can expect.

Latin America and the Caribbean are likely to be among the regions most affected by changes in the Earth's climate, a fact already evident in changing weather patterns, increasingly extreme storms, and escalating floods and droughts.

However, Latin America also boasts vast potential to generate clean, renewable energy, store carbon in natural and working lands, build resilient communities, drive climate innovation, and otherwise lead in the fight to address climate change and mitigate its impacts.

Institutions of higher education, as anchors of their communities, living laboratories, and the educators of tomorrow's leaders, have a **unique role and responsibility** in the effort to address climate change. It is these institutions that will determine whether today's emerging leaders are equipped to tackle the climate crisis, whether through science, business, public service, or any other professional path.

Many of the region's universities and technical/vocational institutions have embraced this challenge head-on and are spearheading ambitious efforts to improve and broaden climate education, strengthen relevant research and innovation, develop solutions in their communities and regions, and inform policy development at all levels.

However, the number of higher education institutions in Latin America and the Caribbean that have acted boldly to address climate change remains concerningly small. Significant barriers, both administrative and financial, stymie the needed reforms and investments, while the few institutions taking aggressive climate action are too often operating in stifling isolation, unable to effectively share their most effective practices with either national or international peers.

The 2022 report, **"Higher Education Climate Action in Latin America and the Caribbean,"** is a first-of-its-kind effort to reveal the current state of climate action at higher education institutions in Latin America and the Caribbean and assess the greatest challenges and opportunities for catalyzing greater climate action at these critically important institutions.

[1] https://www.ohiohistory.org/understanding-the-climate-crisis-part-ii/

Partners of the Americas (POA) and **Second Nature** (SN) have been proud to partner with **Dr. Marco Antonio Berger García** to develop this illuminating study, which we hope will spur institutions in Latin America and the Caribbean, as well as others around the world, to evaluate their unique role in addressing the greatest challenge of our time.

If the region's universities and technical institutions were empowered to mobilize together to address climate change, their impact could be significant. These unique agents of change are among the most important, and largely untapped, resources in the region's effort to combat climate change.

We look forward to seeing how this report may be used by academic institutions, and other public and private entities throughout the region, to further empower and mobilize the higher education to accelerate climate action.

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Acknowledgements
This report would not have been possible without the support and intellectual contributions of the 26 Latin American and Caribbean academics, private and public sector leaders, and climate science practitioners who joined POA and SN for a year-long series of discussions that illuminated the remarkable impact that higher education institutions can and are having in the fight against climate change. To this distinguished group of individuals, we want to express our gratitude for your contributions to this critically important report and to our ongoing efforts to empower more institutions to take aggressive climate action.

POA and SN have formed a strategic alliance to explore how higher education institutions in Latin America and the Caribbean can best be supported in their efforts to address climate change.

Since 1964, POA has worked to empower communities in the Americas to solve problems through service, leadership, and collaboration. POA brings a network of over 2,300 higher education institutions (HEIs) in the Western Hemisphere and a long history of working with HEIs to address development challenges, including climate change. (www.partners.net)

Since 1993, SN has worked to accelerate climate action in, and through, higher education, and has collaborated with over 4,000 faculty and administrators at hundreds of colleges and universities in the U.S., helping them to act on bold climate commitments, scale campus climate initiatives, and create innovative climate solutions. (www.secondnature.org)

1. Executive Summary

The 2022 report, "**Higher Education Climate Action in Latin America and the Caribbean**," is a first-of-its-kind effort to reveal the current state of climate action at higher education institutions in Latin America and the Caribbean and assess the greatest challenges and opportunities for catalyzing greater climate action at these critically important institutions. Through extensive surveys, interviews, case studies and desk research, the report's authors carefully collected and analyzed data from more than 200 HEIs in 16 Latin American and Caribbean countries. The report captures a snapshot of higher education climate action at the macro level and identifies important trends in Latin America and the Caribbean. The following is a list of key data points and findings:

- 44% of surveyed HEIs have an office or department to carry out climate action functions and 36% of HEIs in Latin America and the Caribbean already have **both** a climate action budget along with a specific office to coordinate efforts for climate action[2]. However, **80% of HEIs surveyed invest less than $50,000 a year** specifically for climate action, including medium and large HEIs.

- The primary barriers within HEIs are the **lack of leadership** for climate action within the institution; **little interest and / or commitment** to understand in greater depth the issue of climate change within the HEIs, and the **low amount of financing strategies** for climate action.

- 80% of the HEIs stated that they had involved various actors (students, administrators, academic staff) in the implementation of the climate action plan, or a similar type of plan, within their institution. The rigor of these plans is unclear, however, as **two-thirds of the HEIs analyzed have not undertaken actions to measure their carbon footprint** or used any other related methodology that measures inventories of greenhouse gases and compounds (GyCEI).

- Within the HEIs that do carry out their carbon footprint metrics - or are currently undergoing this process - the inventories show **many greenhouse gases originating in the transport sector, followed by buildings and facilities and waste generation**. This likely mirrors the reality in the Latin American cities and metropolises where they are located.

[2] There are no international datasets or systematic surveys to compare this indicator worldwide. However, according to the survey results this trend has grown rapidly in the last few years.

- The majority of HEIs surveyed (57%) have some deliberative activity for climate action. **Gender equity and human rights are the cross-cutting issues of greatest incorporation in the agenda of Latin American and Caribbean HEIs in relation to climate.**

- 7 out of 10 HEIs surveyed indicated that the current global context caused by the COVID-19 pandemic has migrated institutions towards hybrid/virtual organizational processes with ongoing beneficial impacts for the climate.

- Currently it is identified that most of the projects considered for climate mitigation within the HEIs are concentrated in **5 broad categories: energy efficiency; renewable energy; environmental certifications; sustainable mobility and sustainable architecture and buildings.**

- The 5 most frequent topics on climate action **research** by HEIs are: environmental education for climate change, energy efficiency, human and social impacts in relation to climate change, renewable energies, and climate risk management.

- In terms of education, **19.6% of HEIs have initiated an interdisciplinary strategy in** different academic programs that includes a dissemination component **to internalize the climate issue**, sometimes in combination with the Sustainable Development Goals.

- Around 30% of HEIs have initiated interdisciplinary academic processes that integrate both epistemic perspectives into a joint curriculum with different degrees of achievement. 17.4% of HEIs have invested in efforts for teacher development in MOOC-type climate change courses and 23% participate in international sustainable development networks such as the Sustainable Development Solutions Network (SDSN). There are also areas of opportunity for curricular growth, as more than **60% of HEIs still do not have open and continuing education initiatives on climate change**.

- Like institution-wide barriers, the largest reported **challenges for educational processes and climate change comes from lack of external funding, lack of leadership, and the non-existent or incipient experience of teachers** and the related learning curve that this effort requires.

- In terms of advocacy, public engagement and participation,**39% of HEIs responded that they have designed extension and/or continuing education opportunities** for local communities directly related to climate change. **Six main topics dominate the public engagement agenda: water management, renewable energy technologies, resilience and adaptation, environmental justice, and carbon emissions reduction.**

- **62% of HEIs in Latin America work together with non-governmental organizations on climate action projects.** In terms of cooperation and financing, 70% of HEIs report that they have been involved in government initiatives or projects for climate action with some financial support.

- Likewise, **the majority of HEIs in Latin America (52%) have carried out international cooperation projects** with local and subnational governments either through multi-stakeholder alliances, local cooperation, and/or advocacy. One of the most interesting aspects of cooperation is South-South cooperation, which presents different interesting variants: regional, bilateral, and trilateral. **Almost 20% of Higher Education Institutions in Latin America have participated in a South-South cooperation scheme** (regional 8.7%, bilateral 7.3%, trilateral 2.3%).

- Overall, 32.4% of Higher Education Institutions have not undertaken international cooperation efforts for climate action. **More than 85% of the HEIs involved in the study have expressed their interest in participating in an international network for climate action.**

- **Only 13% of HEIs in LAC have received external funding for a climate action project in the last 5 years, illustrating the critical lack of financing for climate action.** A financial partnership with non-governmental organizations and the private sector are two areas of opportunity for financing climate action in LAC. However, **less than 10% of HEIs have co-participated with a non-governmental organization or private sector company in the development of a project related to climate action.**

- Some HEIs (9%) have begun to attract donations from the private sector or from local, national, and international foundations, but they are still scarce. Likewise, national, and international grants (14.6% and 11.4%, respectively) represent significant areas of opportunity for the acceleration of climate action in the LAC HEIs.

Introduction

This report summarizes the most important challenges and trends currently facing HEIs in Latin America and the Caribbean in terms of climate action. In 2021, more than 200 Higher Education Institutions in 16 Latin American countries participated in the Climate Action Survey for Latin America, one of the first surveys of its kind with this scope. This report identifies some of the main trends in climate action of Higher Education Institutions in Latin America and the Caribbean. The dissemination of the survey was carried out thanks to the cooperation of some of the main academic cooperation networks in the region, who in turn distributed the survey among their institutions at the national and regional levels. We greatly appreciate the Latin American higher education networks -listed in Figure 4 of this report-: ARIUSA and ASCUN from Colombia, the National Association of Universities, and Institutions of Higher Education (ANUIES) in Mexico, the Sustainable Campus Network-Chile, the Universities Network of the Caribbean, and the Sustainable Campus Network in Chile. We also thank the Organization of American States, Second Nature and LASPAU, Partners of the Americas and the 100,000 for their valuable support in disseminating this survey.

2. General Context of Higher Education Institutions in Latin America and the Caribbean

In the context of the current climate emergency, Higher Education Institutions (HEIs) carry out climate actions in various ways ranging from reducing their GyCEI emissions, establishing routes to achieve carbon neutrality, designing energy efficiency plans and architectural models based on nature, updating and internationalization of the curriculum, performing research on climate change, participation and community environmental management, the formation and participation of cooperation networks, strategic alliances, and financing for climate action.

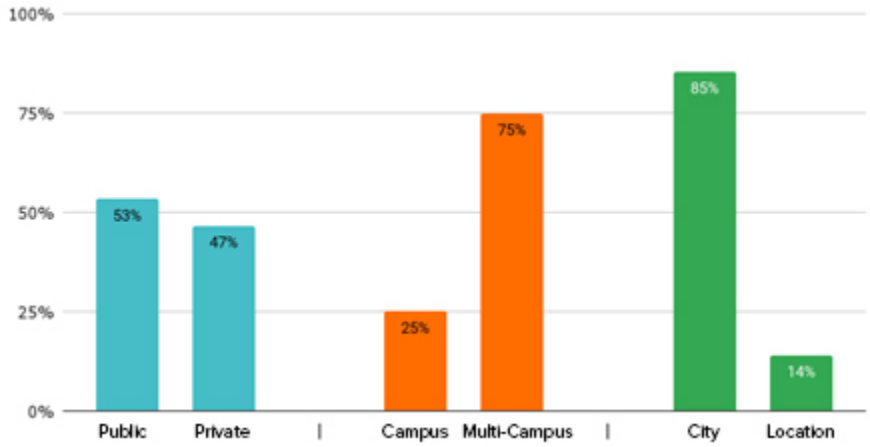
The results of the Climate Action Survey help to understand the trends and challenges of climate action that HEIs currently face in their own institutional planning and their academic functions of teaching and research, but also as facilitators of initiatives for climate action on and off campus.

Institutional leadership around climate action can be anchored from diverse domains within higher education institutions: From graduate programs, strategic planning and financing divisions, development, planning and institutional innovation to the very diverse range of divisions, faculties and/or departments of the different scientific areas.

Map I Geographical Distribution of the HEIs participating in the survey

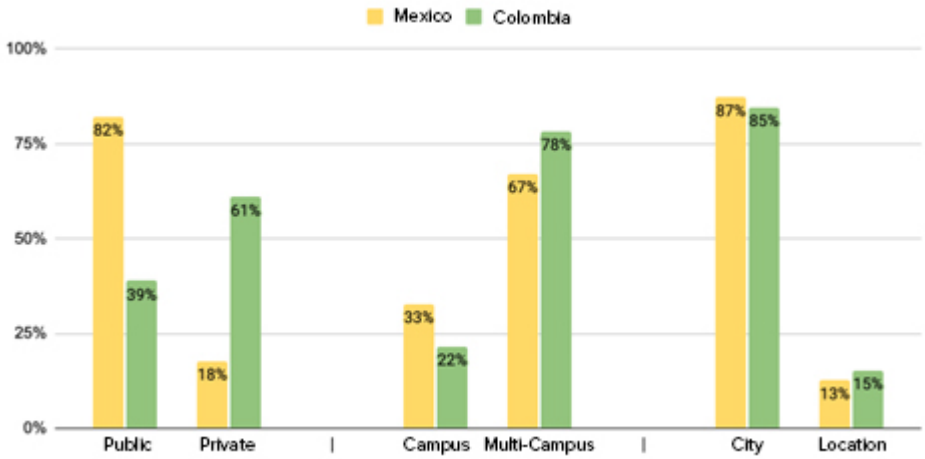
Source: Climate Action Survey for Latin America

Figure 1. Profile of the Participating HEIs



Source: Climate Action Survey for Latin America 2021.

Figure 2. Structure and Nature of HEIs participating in Mexico and Colombia



Source: Climate Action Survey for Latin America 2021.

The structure and nature of the HEIs participating in the survey is important: In general, a balanced distribution between public and private HEIs[3] is observed. It is important to recognize that in the participating HEIs, multi-site models predominate. These are systems distributed in multiple geographical locations within the same city, metropolitan area or state, provincial or departmental geographical demarcation. Finally, it highlights the fact that most of the participating HEIs are in cities, understood as urban agglomerations greater than 50,000 inhabitants.

[3] In general, public HEIs in the Latin American and Caribbean context means a public subsidy scheme by the state at the national, subnational, or local level, in such a way that the tuition is not absorbed by the student.

There is a wide participation of at least 10 higher education institutions in countries such as Chile, Brazil, Argentina, and Costa Rica with a clear wide predominance in the participation of HEIs in Colombia and Mexico, as shown in Figure 3. Within these two countries, there is a wide diversity by type of institution: public, private, multi-campus, urban and rural locations, and wide geographical distribution.

Figure 3. Frequency and percentage of surveys by country and region

Region	Country	Frequency	Percentage
North	United States	6	2.7
	Mexico	65	29.7
Central	Costa Rica	12	5.5
	El Salvador	9	4.1
	Guatemala	5	2.3
	Honduras	5	2.3
	Nicaragua	4	1.8
South	Argentina	19	8.7
	Bolivia	2	0.9
	Brazil	17	7.8
	Chile	13	5.9
	Colombia	41	18.7
	Ecuador	4	1.8
	Paraguay	3	1.4
	Peru	5	2.3
	Uruguay	1	0.5
Caribbean	Dominican Republic	8	3.7
Total		219	100

Source: Climate Action Survey for Latin America and the Caribbean 2021.

In some sections of the survey, differentiated analyses are carried out by region or country to identify more consistent and focused trends, mainly at the exploratory level to raise working hypotheses and distinguish the specific cases of HEIs that are currently carrying out innovative experiences. This also identified good practices and significant interventions that are possibly scalable and replicable in other HEIs in Latin America and the Caribbean.

Given the diversity in the structure and types of HEIs, as well as the heterogeneity in the institutional frameworks in Latin America, it is difficult to establish statistical sample frameworks representative of the higher education ecosystems in Latin America and the Caribbean. Therefore, the focus of this report is exploratory and descriptive, surfacing major themes and experiences currently carried out by HEIs in Latin America and the Caribbean that were able to participate in the survey. The institutions were primarily recruited through the invitation of the main higher education networks in Latin America.

Figure 4. HEI Networks that Distributed the Survey

Networks	Headquarters
ARIUSA	Colombia
Second Nature and LASPAU	United States of America
Organization of American States	United States of America
Partners of the Americas and the 100,000 Strong in the Americas Innovation Network	United States of America
National Association of Universities and Institutions of Higher Education. ANUIES	Mexico
ASCUN Colombian Association of Universities	Colombia
Sustainable Campus Network-Chile	Chile
Union of Latin American Universities (UDUAL)	Mexico
Universities Caribbean	Jamaica

There are also some United States HEIs that were consulted to answer this survey due to their involvement in research projects and networks in Latin America on sustainability issues. They also have a Hispanic population within their academic community and the cities where they are located and have shown leadership for climate action at a global level. These institutions included Arizona State University, Georgia Gwinnett College, University of Notre Dame, University of Texas at Arlington, University of Bridgeport, and Tennessee State University.

Objectives and Focus of the Report

By their very nature, HEIs are organizations that often collaborate under the purview of thematic areas of inquiry. In the case of this report, we assumed this characteristic of the sector would facilitate the formation of *networks for climate action.* It is important, however, to explore, identify and properly evaluate the processes, areas of opportunity, and barriers that currently determine the effectiveness of climate action in the context of current higher education. In that sense, the findings obtained from the diversity of the HEIs participating in the climate action survey offer insights based on local contexts with a view to regional cooperation and participation. These findings will also enhance policies and initiatives that are facing the climate change challenge.

In the face of the current climate emergency, HEIs are considering – both in their daily work and in their medium and long-term planning – the best strategies to effectively take climate action. The routes to climate action involve challenges in terms of methodology, governance, communication, mobilization, inclusion, and transversality.

At the center of this discussion between constraints and potentialities, and for the purposes of this report, at least three distinctive features of HEIs are recognized that can contribute to more effective action routes and cooperation for climate action: First, HEIs as **catalysts for climate action** at the local and international level. Second, the potential of the **scaling ups** of successful climate actions within HEIs and **replicability** in other contexts of significant climatic actions in contemporary Latin American and Caribbean HEIs. Third, to disseminate the **lessons from case studies** to accelerate the processes of transition from individual work to collaborative networks for climate action.

HEIs serve as catalysts in this effort for climate action. As complex and robust organizations, HEIs establish guidelines for individualized climate action regarding their own work and performance. This also requires establishing connections with ecosystems and external entities that go beyond university campuses. A diffuse problem like the climate crisis nested in complex organizations such as universities can be a major challenge. It also offers very promising areas of opportunity and great potential for climate action in the coming years, especially through cooperation.

To carry out the scaling up of successful climate actions among HEIs, it is necessary to diagnose the main aspects of climate action that HEIs in Latin America

are currently undertaking throughout their various substantive, management, and linkage functions, as well as their systemic interrelations towards other actors.

The climate action survey prepared as the basis for this report, as well as the case studies included, allow us to identify and compare the main aspects for climate action currently carried out by Latin American HEIs. The results aim to be a tool to delineate, refine and strengthen inter-institutional collaboration strategies for climate action based on regional proximities.

Once these actions have been identified in detail, it is then possible for HEIs to outline strategies and roadmaps for transferring climate policies and actions among higher education institutions to scale climate action either through collaborative networks, strategic alliances, and other comprehensive collaborative schemes. Scaling up happens on two levels: first within the HEIs themselves or through their own planning instruments and other initiatives and, secondly, through external linkage strategies with other actors.

The objectives for this report are:

a) Identify the **triggering aspects for climate action** within HEIs in Latin America and the Caribbean
b) To examine the main **trends** currently being undertaken by HEIs in Latin America and the Caribbean in terms of climate action.
c) Achieve a greater understanding of the factors that explain the **scaling of experiences** through local and regional collaborative networks for climate action.
d) Map good practices for **accelerating** the implementation of climate action in Latin American HEIs, with higher levels of climate ambition within the framework of the Paris Agreements and the 2030 Agenda.

The Acceleration of Climate Action in LAC HEIs

To increase levels of climate ambition in the context of higher education effectively, collaborative strategies must be implemented in multiple areas: climate finance; local, regional, and international cooperation, curriculum, alignment with national and subnational policies, and countries' guiding instruments for climate action. Latin American. In Latin America, local contexts offer significant areas of opportunity for climate action. It is true that while the Latin American region is not the main generator of Greenhouse Gases and Compounds (GyCEI), its territory offers important conditions to carry out mitigation, adaptation, and resilience actions (Bárcena et al, 2019).

There are multiple ways through which HEIs in the Americas can influence climate action either through their substantive institutional functions, or through the design and co-creation of scaling models and catalysts that lead to cooperation abroad.

Figure 5: Higher Education Sector as a Climate Accelerator

The basic framework for this report called *the Higher Education Sector as a Climate Accelerator* is composed of 6 categories of action each of which includes substantive and diverse institutional functions that are grouped into 6 categories: research (basic and translational), large and long-lasting institutional characteristics, education, advocacy and policy, administration and finance, and operations.

In each of these categories of action are located various substantive functions at the institutional level which include aspects such as: instruments of institutional planning and academic management (agreements, facilitation, and planning); curricular design; student activism to influence public policy.

The processes and categories of analysis in the acceleration model for climate action in higher education institutions in Latin America are non-linear, multilevel and multi-stakeholder, which implies making visible and strengthening the role of enabling conditions within the functions of HEIs and thus complementing their basic functions (typically framed as teaching, research, and service), through processes of facilitation and indirect empowerment of other actors outside the institutions of higher education themselves. Currently, different interventions at the level of international climate action consider acceleration as a methodological tool for climate action. For mitigation acceleration links to renewable energy generation, energy efficiency upgrades, the development of carbon budgets and ecosystem-based adaptation (EBA).

CASE STUDY I. *THE PRESIDENT´S CLIMATE LEADERSHIP COMMITMENTS: AN OPPORTUNITY FOR HIGHER EDUCATION INSTITUTIONS IN LATIN AMERICA AND THE CARIBBEAN*

Second Nature's Presidents' Climate Leadership Commitments (Commitments) assume that Universities fulfill two main functions in environmental matters: first, they are institutional actors where they work with plans and programs to achieve certain climate action objectives on their own campuses. The second is that they use research, teaching, and other academic resources to enable action in entities outside of higher education. Both must be coordinated and carried out to maximize HEI's contributions to the goals of sustainability and climate action.

The Commitments were launched in 2006 and the Climate Leadership Network quickly formed around the program, which has now been in existence for over 15 years. The agreement works as follows: First they are given 2 months to form the work team to analyze the climate situations, create action plans and carry them out for the future years. Within a year they must make an inventory of greenhouse gas emissions. In two years, they need to complete a Climate Action Plan - a detailed path where the actions required to reach the goal are clearly described.

Finally, every year they must publicly report their progress towards these goals. Second Nature supports a public reporting platform where you can see

the trends of how close or far they are from meeting their goals. Every 5 years the Climate Action Plan is reviewed so that it can change over time and adapt to new changes in technology, innovation, the campus, or the situation of the city.

Methodological Approach

This report is part of a conceptual reference framework called *Higher Education as Climate Accelerator* refined by the *Stakeholder Committee for Higher Education Climate Action for Latin America and the Caribbean* and composed of 30 academic and both public and private sector leaders with experience in climate action issues HEIs in Latin America and the Caribbean.

The report also takes as a point of reference the Climate Acceleration Framework and the findings of the review of the literature about climate change in contemporary Higher Education at a global level are included. For the design of the Survey on Climate Action in Higher Education Institutions in Latin America, more than 219 Higher Education Institutions from 15 countries in Latin America and the Caribbean participated.

There are 7 areas of interest and influence defined for climate action through the survey, each of which offers challenges and areas of opportunity to define the roadmaps for climate action of Latin American HEIs for the coming years:

1. Background of institutional context.
2. Institutional planning for climate action
3. Research
4. Education (Curriculum/Academic Programs)
5. Promotion, dissemination, and participation,
6. International cooperation
7. Financing.

The survey consists of 73 questions that measure the main direct and indirect variables around climate action in HEIs in the subcontinent. The interpretation of the responses allows us to identify the major trends in climate action of Latin American HEIs and the local and regional ways that climate action is carried out. While some of the experiences of HEIs depend on specific local contexts, there are other initiatives that have a high potential for replication and scaling at the regional level.

Additionally, the survey includes open-ended questions in each section that provides qualitative data around climate action in HEIs in Latin America and the Caribbean. These qualitative findings enrich the general trends obtained from the responses with local and regional experiences that are likely to be disseminated and transferred to other contexts of Latin American HEIs.

Most global climate change surveys have focused on citizens' perceptions of the problems associated with climate change and the possible alternatives to solve it, particularly in the perception of students. Global surveys such as the one conducted a decade ago with the participation of students from 166 universities in 43 countries stand out. In this survey, Leal Filho (2010) in *Universities and Climate Change* points out the importance of students' perceptions in how they understand the phenomenon of climate change and its implications in their daily lives through the "World *Climate Change Survey"* and the competencies and skills required by current students to face the global challenge.

For its part, Moltan-Hill (2019 conducted a survey with the participation of 212 HEIs distributed in 45 countries to examine areas of opportunity at the curriculum level on the topic of internalization of climate change. Both surveys created frameworks for climate action in HEIs in the areas of skills development, curriculum, and research.

While it is true that the curriculum, research, student competences, and student perception themes are crucial in the functions of HEIs to improve their climate action, it is equally important to understand the dynamics of management, linkage and cooperation currently carried out by Latin American HEIs to address the climate emergency more effectively and with greater levels of impact and ambition. Our survey complements the educational, curricular and research aspects –fundamental pillars in the work of HEIs – with other additional aspects to accelerate climate action in the region that are set out below:

1. Institutional planning instruments and the extent to which these have been adapted for climate action in recent years.
2. Opportunities, management, and innovation
3. Promotion, dissemination, and participation
4. International Cooperation: Cooperative relationships with other actors to increase their ambition for climate action
5. Financing

In summary, the survey is intended to highlight aspects that identify – and eventually define – the distinctive features of *HEIs as catalysts for climate action* which include both direct actions and enabling conditions (enablers).[4]

Case Studies as an Analysis Tool

For this report, 17 case studies are developed based on in-depth interviews with actors and leaders of climate action in HEIs in Latin America and the Caribbean, selected based on innovation and replicability criteria. These case studies allow us to visualize good practices, trends, challenges, and opportunities for the acceleration of climate action in various contexts. Each of the case studies delves into a central, representative, and scalable theme that reflects the connections required for the acceleration of climate action in Latin American HEIs.

Different types of cases are presented, some of them represent typical operational examples that mitigate climate change, (e.g., mitigation via energy efficiency); others are presented more in terms of a climate challenge or **problem** overcome, usually in terms of adaptation or resilience. Most of the cases are action-focused and fall within the framework of accelerating climate action in higher education presented in the first section of this report. The case studies, as well as the findings and hypotheses around the survey, aim to serve as inputs for future research.

Figure 6. Case Studies for Accelerating Climate Action in Latin America and the Caribbean

Case	Country/Region	Theme and focus within climate action
I. The *Race to Zero* campaign and the challenges for Universities in Latin America.	Global Initiative	Global campaign to encourage non-binding zero-carbon commitments by HEI´s.
II. University Carbon Neutrality: A Sustainable Campus Network.	Chile	Collaborative regional effort with a common goal: To achieve carbon neutrality at the campus level and learn the process.
III: The Network of Argentine Universities for Environmental Management and Social	Argentina	Training for Sustainability and Climate Change in Higher Education

[4] The role of enabling conditions is central to climate action, among other things, to create synergies between mitigation and adaptation policies for climate change (Duguma et al, 2014).

Inclusion (UAGAIS Network)		Regional response to the need to coordinate efforts and establish alliances around sustainability and climate change in higher education at the national level.
IV. Autonomous University of Bucaramanga (UNAB) - ε-BiO - Center for Research in Circular Bioeconomy.	Colombia	Research and Innovation
V. State University of Rio de Janeiro. - The Interdisciplinary Observatory on Climate Change,	Brazil	Action research
VI. University of Manizales	Colombia	Innovation, Design Thinking and Climate Change.
VII. La Pan-American Agricultural School, Zamorano (EAP Zamorano)	Honduras	The approach to climate change from agricultural sciences.
VIII: The Latin American Faculty of Social Sciences (FLACSO)	South America Region	Training in Climate Change from the perspective of the Social Sciences.
IX. University of Antioch	Colombia	?????
X. University of Caldas	Colombia	Towards the establishment of Climate Laboratories.
XI. The Autonomous University of Baja California Sur (UABCS)	Mexico	Accompaniment to local governments in their region.
XII. National University of Asunción	Paraguay	?????
XIII. UNESCO UNITWIN Programme - The Regional Network on Climate Change and Decision Making.	Global Initiative	A Network for Climate Adaptation.
XIV. Forum of Environmental Managers of Provinces, States and Regions of Latin America and the Caribbean	South America	An example of appropriation, participation, and extension
XV. Scientific University of the South	Peru	Cooperation and Linkage for Climate Action
XVI. National University of the Littoral	Argentina	Cooperation for Climate Adaptation and Resilience
XVII. Barna Management School	Dominican Republic	Cooperation and linkage for climate action: the case of the Sustainability Research Center

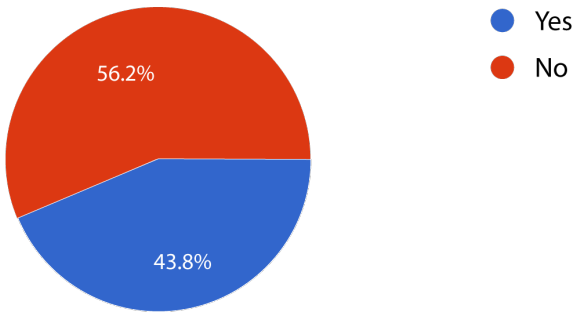
The case studies provide a more specific example of the most innovative and advanced climate action in the region, either at the institutional level, or through collaborative networks. These cases also provide lessons to identify possible success factors for climate action. Some processes can be glimpsed *a priori* and have to do with external variables such as financing, governance, or scale. But some others have to do with innovation processes and culture within the HEIs themselves. We are currently in a ramp-up stage to move towards climate action in HEIs in the region and this creates a challenge to identify common areas of opportunity that will accelerate the processes of scaling up ambition for climate action simply based on case studies. Therefore, we use a mixed methods approach to apply these data sources to our recommendations.

3. Institutional Planning for Climate Action

It is relevant to know whether HEIs in Latin America and the Caribbean have an office that addresses specific issues related to climate action: According to the results of the survey, **44% of HEIs have an office or department to carry out climate** [5] action functions. In most cases, issues related to climate change are anchored to an office with a more general title such as environment or sustainable development.

The existence *per se* of an environmental affairs office does not necessarily represent a necessary condition for the effective implementation of climate action within HEIs. However, **the existence, operation and appointment** of a climate change affairs office can be very beneficial as an acceleration action for several reasons: a) organizational visibility b) efficiency in the management of projects around climate action c) strategic planning and budgeting around climate action and d) as a coordinating climate action platform around a multiplicity of actors within the institution, whose actions must be concurrent.

Figure 7. Percentage of HEIs that have an administrative office for climate policy. n=219

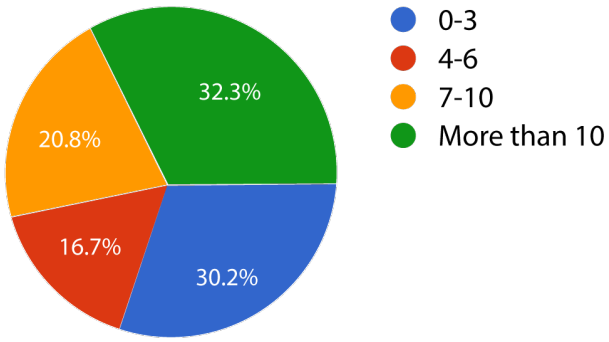


Source: Climate Action Survey for Latin America and the Caribbean 2021.

The structure, volume and profile of the office in charge of climate action in HEIs is also important for the implementation of climate action within university campuses: 32% of the HEIs that do have a specific office for climate action (n=96).reportedly have more than 10 full-time people assigned to climate action work; while 30% of that same subset of HEIs indicated they barely have the minimum necessary staff (from 0 to 3 people) to carry out their basic functions, which reflects areas of opportunity to invest in human capital dedicated to climate action within Latin American HEIs.

[5] This does not imply to necessarily have an office *exclusive* for climate action. However, it does imply at least having an area that encompasses sustainability and environmental issues within the institution's facilities.

Figure 8. Percentages of HEIs according to the number of personnel in climate action functions. n=96



Source: Climate Action Survey for Latin America and the Caribbean 2021.

According to the survey participants, there are some significant differences between the regions in the number of formal offices for climate action within the HEIs.

Figure 9. Frequency of HEIs that have an Administrative Office for climate policy by region.

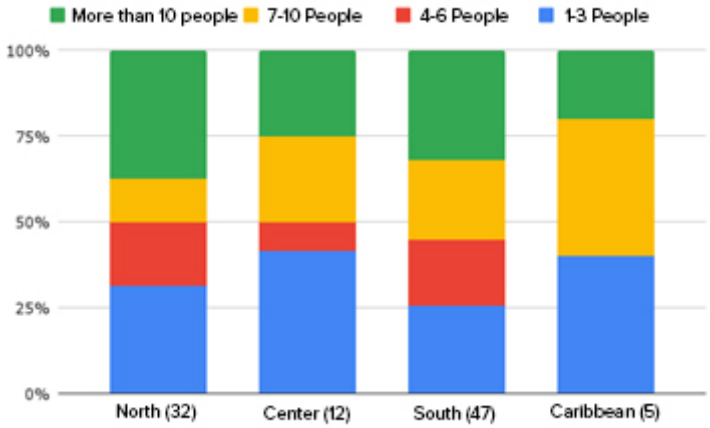
Country/Region	*Yes*	*No*	*Total*
United States	4	2	6
Mexico	28	37	65
North	**32**	**39**	**71**
	45.10%	**54.90%**	**100%**
Costa Rica	7	5	12
El Salvador	0	9	9
Guatemala	3	2	5
Honduras	0	5	5
Nicaragua	2	2	4
Central	**12**	**23**	**35**
	34.30%	**65.70%**	**100%**
Argentina	5	14	19
Bolivia	0	2	2
Brazil	9	8	17
Chile	5	8	13
Colombia	24	17	41
Ecuador	1	3	4
Paraguay	1	2	3
Peru	2	3	5
Uruguay	0	1	1
South	**47**	**58**	**105**

	44.80%	55.20%	100%
Dominican Republic	5	3	8
	5	**3**	**8**
Caribbean	**62.50%**	**37.50%**	**100%**

Source: Climate Action Survey for Latin America and the Caribbean 2021.

On average, the HEIs in Central America and the Caribbean report fewer personnel dedicated to the functions of climate action, compared to the HEIs of South America and North America.

Figure 10. Percentages of HEIs by region according to the number of personnel in climate action functions. n=96



Source: Climate Action Survey for Latin America and the Caribbean 2021.

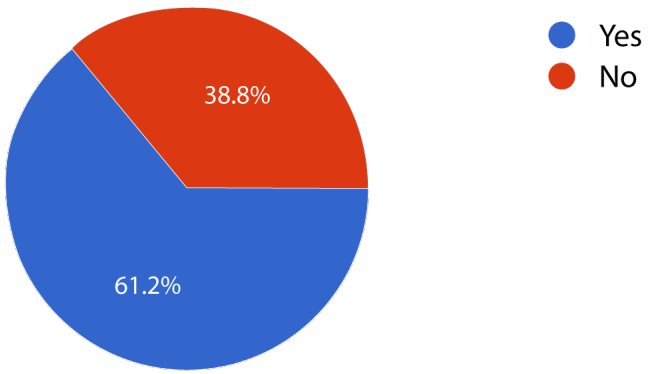
The name of the office, unit or department carrying out climate action functions may also be relevant for communication and organizational purposes. There is a wide variety of concepts around the title, most of them linked to sustainability actions, without specifying climate action. Sometimes, the name imprints the intentionality of the office from the start with labels such as innovation, planning, ecology, or social responsibility.

Budget for Climate Action

HEIs allocate their financial resources towards climate action in various ways: Either by focusing on their own operational and management functions, or through the implementation of various projects that can contribute directly and indirectly towards climate actions (e.g., energy and water efficiency; integrated waste management or sustainable purchasing). That is why separating the budget allocated by the HEIs for climate action represents a methodological challenge, since it is common to find projects and actions in the HEIs that do not necessarily have a budget allocation labeled or assigned for that specific purpose but that indirectly pays for some activity associated with climate change.

This situation occurs both for mitigation actions such as energy efficiency upgrades, or for adaptation actions such as the increase and maintenance of green areas or rainwater harvesting systems within university campuses. Approximately 61% of the HEIs participating in the survey stated that they had budgetary allocations for mitigation, adaptation and/or climate resilience actions, mainly through their operational functions.

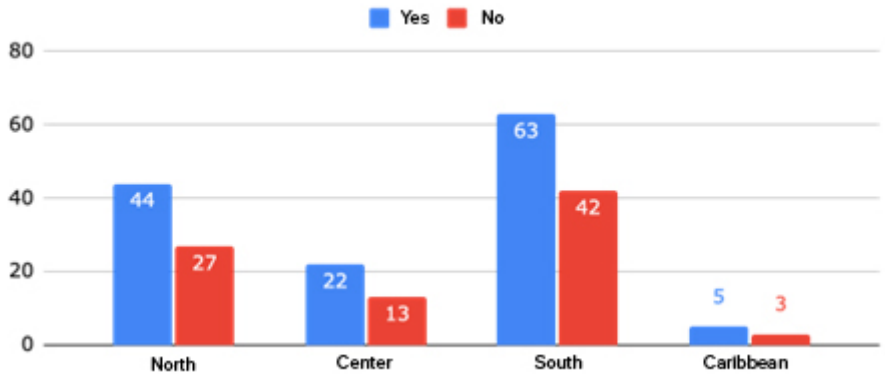
Figure 11. Percentage of HEIs with budget for climate action. n=219



Source: Climate Action Survey for Latin America and the Caribbean 2021.

Geographically, there are no significant relative differences between the HEI responses, as all regions reflect the aggregated regional average of ~60% with a budget, although the southern region has the most institutions with budgeted allocations in absolute terms.

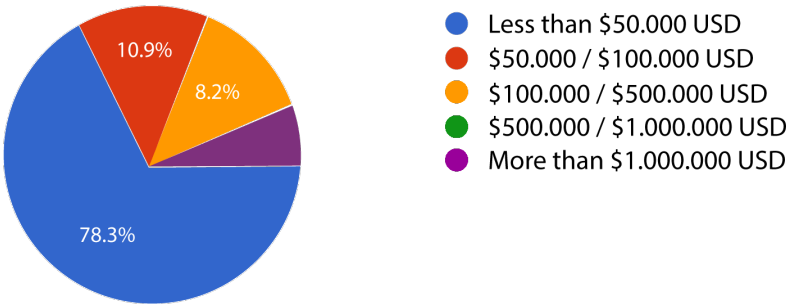
Figure 12. Frequency of HEIs per region with budget for climate action. n=219



Source: Climate Action Survey for the Americas and the Caribbean 2021.

The amount of reported climate budget is low. 4 out of 5 institutions surveyed invest less than 50,000 USD per year specifically for climate action, including medium and large HEIs. **This reflects a problem like that of subnational governments in Latin America: Climate action is not a budgetary priority.** This will likely continue to be the case if it is not articulated as part of a comprehensive and transversal strategy in all - or most - of the substantive functions of the HEIs (teaching, research, curriculum, and extension).

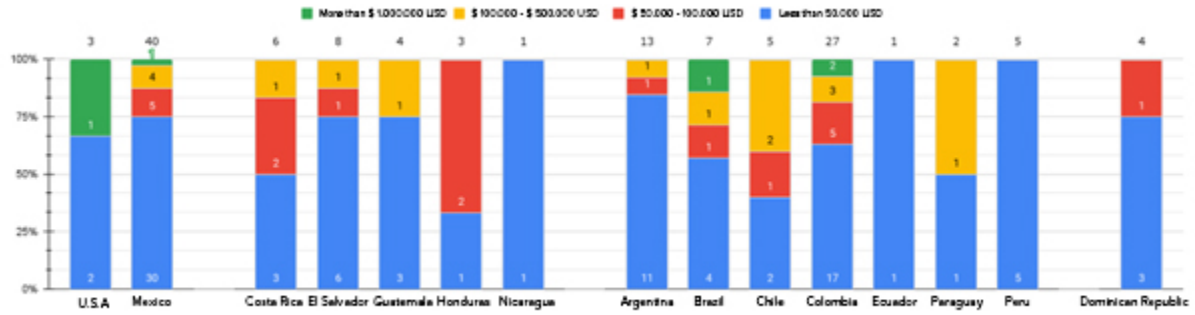
Figure 13. Percentage of HEIs according to their budget for climate action



Source: Climate Action Survey for Latin America and the Caribbean 2021.

Aunque no existe un camino único para incrementar el financiamiento climático al interior de las IES, -pues ello depende de múltiples variables a distintas escalas- la existencia de una oficina que lidere la acción por el clima al interior de la IES, es una condición que facilita en buena medida la eventual atracción, negociación y asignación de fondos para la acción climática.

Figure 14. Percentage and frequency of HEIs per country according to its climate action budget



Fuente: Encuesta de acción climática para América Latina y el Caribe 2021.

Among the main reported institutional barriers to expand human resources for climate action, as well as budgets insufficient to establish ambitious mechanisms to face climate action are: a) lack of leadership for climate action within the institution; b) lack of interest and / or commitment to understand in greater depth the great issue of climate change within the institution[6] and, c) lack of financing strategies for climate action.

The combination of budget and administrative capacities is important to consolidate climate action within HEIs: The ideal combination is to have the budgets for climate action combined with an administrative office, 36% of HEIs fall into this category. **However, almost a third of HEIs still do not have either of these two elements (administrative office and allocated budget).** The remaining institutions either have a budget, without a specific office for climate action (second best situation) or to have a climate action office without specific financing. This latter situation could be supported by the financing of other strategic actions related to sustainable development and the environment at the organizational level.

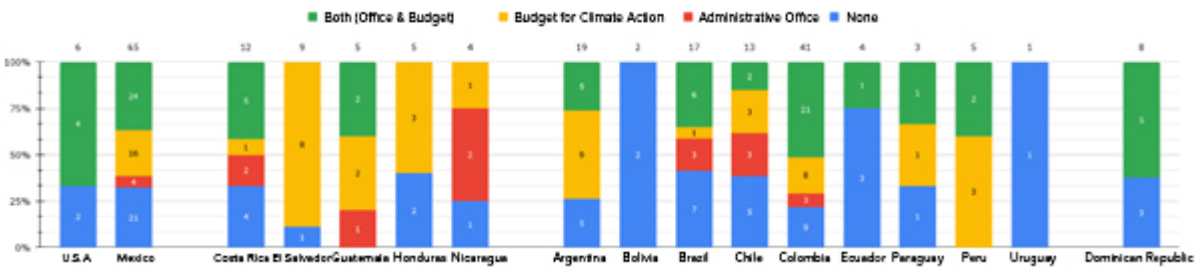
[6] and, therefore, the scarce spillover of ambitious climate action projects towards the different organizational channels

Figure 15. Percentages and frequency of HEIs

		Administrative Office		
		No	Yes	Total
Budget for Climate Action	No	67 (31%)	18 (8%)	85
	Yes	56 (26%)	78 (36%)	134
	Total	123	96	219 (100%)

Source: Climate Action Survey for Latin America and the Caribbean 2021.

Figure 16. Percentage and frequency of financing and administrative offices in HEIs by country

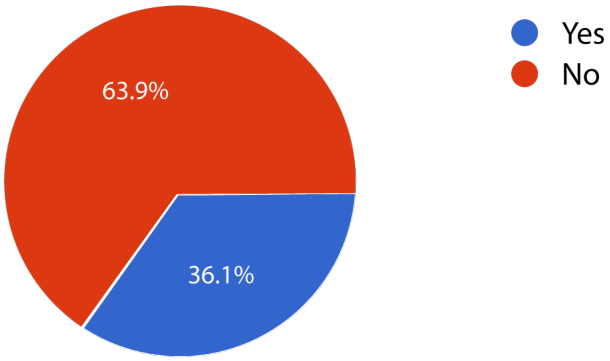


Source: Climate Action Survey for Latin America and the Caribbean 2021.

Planning Instruments for Climate Action within HEIS.

HEIs generally have a planning instrument that governs the substantive functions of the institution over a multi-year period where institutional strategic planning is designed in the short, medium, and long term. The incorporation of climate action into this instrument is critical not only for the improvement of processes, monitoring, evaluation, results, and foresight, but also to establish a clear signal both within the institution and for external actors the climate action is a priority.

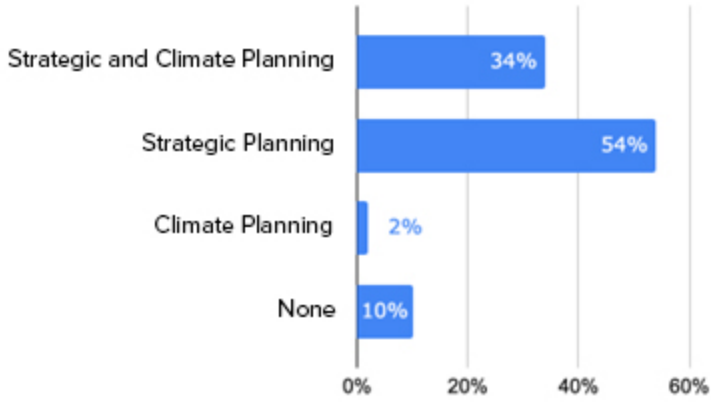
Figure 17. Percentage of HEIs in which yes or no include climate action in their strategic planning. N=219



Source: Climate Action Survey for Latin America and the Caribbean 2021.

A third of the HEIs surveyed indicate having a chapter / section / annex or independent document that includes climate action explicitly and comprehensively within the strategic planning of their institution. There is a great area of opportunity if one considers that more than half of the participating HEIs have strategic planning instruments within their institution but are still without a climate action section.

Figure 18. Percentage of HEIs according to their institutional planning. n=219

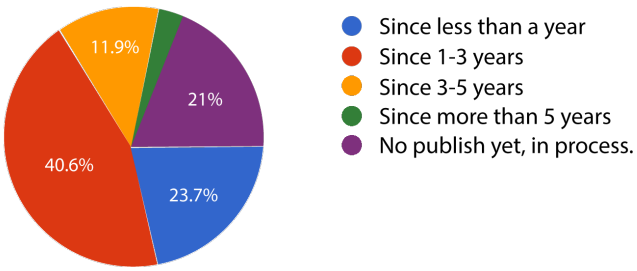


Source: Climate Action Survey for Latin America and the Caribbean 2021.

These results lead us to a second area of opportunity for climate action in HEIs in terms of institutional planning: **It is very important to introduce the issue of climate action within the institution's strategic planning documents and its articulation with other instruments, including budgetary ones.**[7]

Physical master planning is another planning instrument that can be leveraged for climate action. Within the institutional master plans/programs, *76% of them* have been published or updated relatively recently - less than 5 years. These renewal periods create an ideal nexus for the consideration of the Paris Agreement and the incorporation of Nationally Determined Contributions (NDCs) and other instruments for climate action within the great discussion that has taken place worldwide around the issue of climate action.

Figure 19. Percentage of HEIs according to the period of publication or updating of their institutional plans. n=219

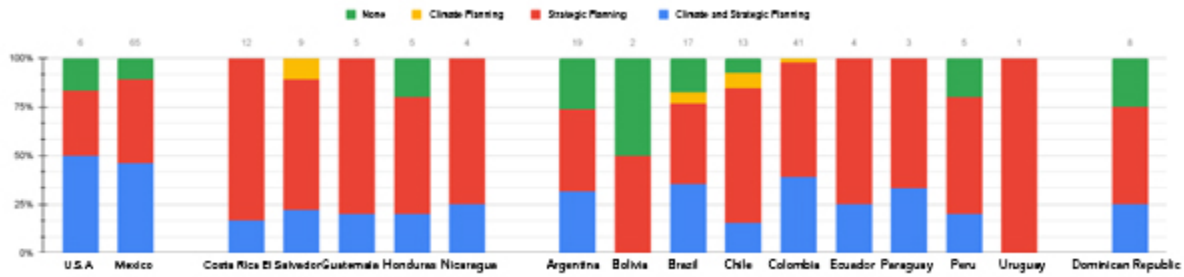


Source: Climate Action Survey for Latin America and the Caribbean 2021.

[7] The incorporation of climate action within the instruments of strategic planning can imply, from the outset, a challenge at the methodological level because in many cases the incorporation of globally managed metrics such as the Intergovernmental Panel on Climate Change (IPCC), nationally determined contributions (NDCs) and the United Nations Framework Convention on Climate Change (UNFCCC), the Carbon budgets or inventories of greenhouse gases and compounds for which there may not be enough "critical mass" or enabling conditions to implement them or invest in the construction, for example, of baselines. This challenge should not be seen as a barrier to action because an incremental approach can be adopted at the outset, with the explicit incorporation of climate action in a general way within the action plans, with the intentionality of building metrics over time.

There are significant regional differences regarding the inclusion of climate action within strategic planning in the HEIs themselves, given that greater consolidation is observed in some countries with broader higher education systems such as Brazil, Argentina, Columbia, and Mexico. In several of the countries surveyed, there are not enough responses to make meaningful interpretations in this regard. At the level of an exploratory hypothesis, however it is possible to visualize some trends as seen in Figure 20.

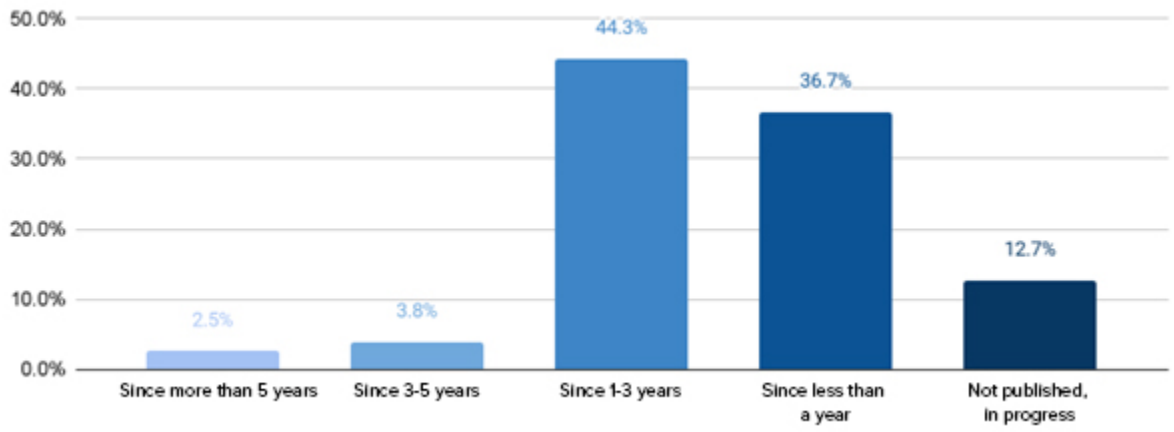
Figure 20. Percentage distribution of HEIs by country according to their institutional planning



Source: Climate Action Survey for Latin America and the Caribbean 2021.

It is also striking that of the total climate action plans of the HEIs surveyed, 13% are still in the process of construction and publication. In these cases, there is a clear opportunity to incorporate the latest findings on climate science and international reports on the subject.[8] **It is also evident at the regional level that of institutional plans which including climate action is a recent development and has grown significantly since the 2015 Paris Agreement.**

Figure 21. Percentage of HEIs according to the year of publication of their climate action plans. (n=79)



[8] From the survey, a repository of 79 institutional plans were obtained that are systematized as an extension of this report.

Source: Climate Action Survey for Latin America and the Caribbean 2021.

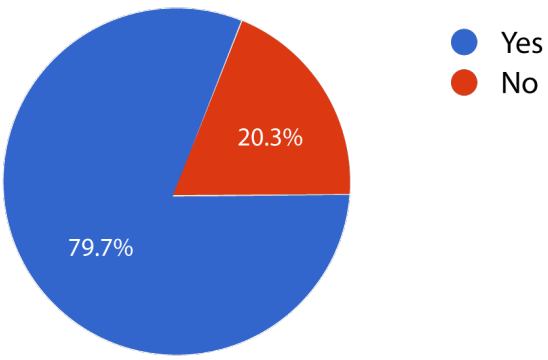
"Top-down" and *"bottom-up"* approaches have permeated the discussion about the strategic planning processes of HEIs in recent decades. Linking climate action in institutional planning instruments relates to this debate. To involve the largest number of actors for climate action within universities, it is advisable to include participatory processes in its creation, as an enabling condition for their sustained involvement after the implementation of the institutional development plan (or related instrument).

This participation includes the involvement of students, academic staff, and administrators, who, from different experiences of their work and role in the academic community, provide distinct perspectives both in the design, but more importantly, in the implementation, appropriation and co-creation of actions and their evaluation and monitoring over time.

80% of the HEIs stated that they had involved various actors (students, administrators, academic staff) in the creation of the climate action plan - or similar planning document - of their institution. This inclusion increases the capacity for responsive and adaptative integration of the educational community in a cooperative framework. This feature also incentivizes transparency both for educational purposes and in terms of accountability.

Climate change reporting at the international level have permeated and grown significantly in recent years. Among them are the international platform Carbon Disclosure Project, now called CDP. At the level of the HEIs, these good practices for climate action can be adopted within the framework of the institutional accountability mechanisms themselves; but at the same time promote education for sustainability and climate action and they must attract critical masses within academic communities to accelerate the changes required in climate action. Climate transparency is therefore a good practice for accelerating climate action.

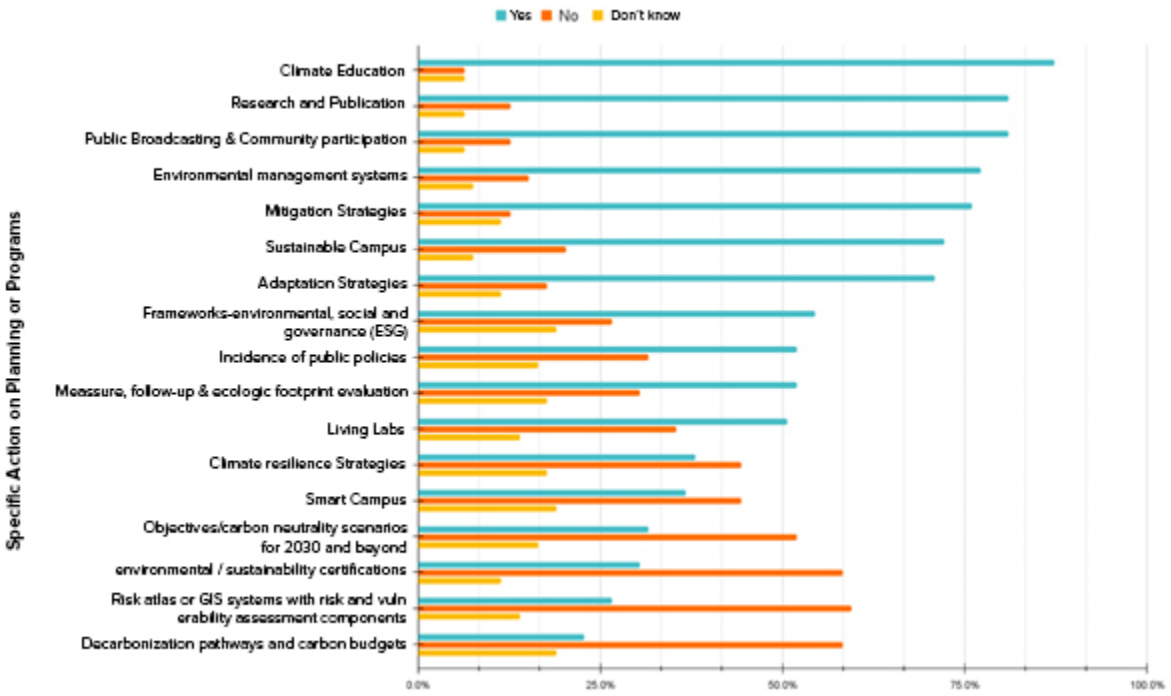
Figure 22. Percentage of HEIs carrying out a participatory process in the elaboration of their strategic climate planning. (n=79)



Source: Climate Action Survey for Latin America and the Caribbean 2021.

There are several common elements in many of the institutional climate action plans and these common elements help to illustrate the vision that HEIs have for climate action. Those include: (i) climate education; ii) publications and research products and iii) community/public participation.

Figure 23. Percentages of HEIs according to the type of actions included in their institutional climate action plans. (n=79)



Source: Climate Action Survey for Latin America and the Caribbean 2021.

The best climate action planning frameworks by HEIs include not only typical mitigation perspectives such as energy efficiency, but also some important adaptation strategies. Specifically, ecosystem-based adaptation (EBA) offers a promising opportunity as both a line of research and as a link to local contexts. The experiences in the field of climate adaptation currently carried out by HEIs in the field of EBA and the lessons and good practices that derive from it are varied (See case studies 2 and 4).

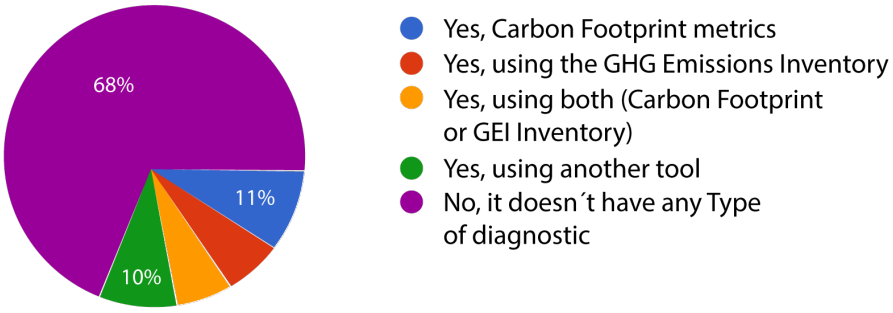
In addition to the frameworks for climate action used by HEIs, there are several reported themes that have been emerging in recent years including: curricular reform to focus on environmental issues, incorporation of the environmental dimensions in university management and green purchasing; and preservation and / or management of natural areas, urban parks, and urban and rural landscaping actions.

Carbon Footprint

One of the most widespread forms of climate-related reporting has been the measurement of an institution's carbon footprint. HEIs in Latin America and the Caribbean have not been oblivious to this tendency, trying to measure their own carbon footprint from different methodological approaches. However, progress in measurement still presents important areas of opportunity, since **two thirds of the HEIs analyzed have not undertaken actions to measure their carbon footprint** or any other related methodology that measures inventories of greenhouse gases and compounds (GyCEI).

One of the co-benefits in the measurement of the carbon footprint is the involvement of the academic community, especially as students can be direct participants in the development of this exercise. This activity provides a high-quality educational experience and meets an essential need in an HEI's climate activity. **The measurement of the carbon footprint is framed as one of the first steps on the route to establish commitments that tend towards carbon neutrality in Latin American higher education facilities.**

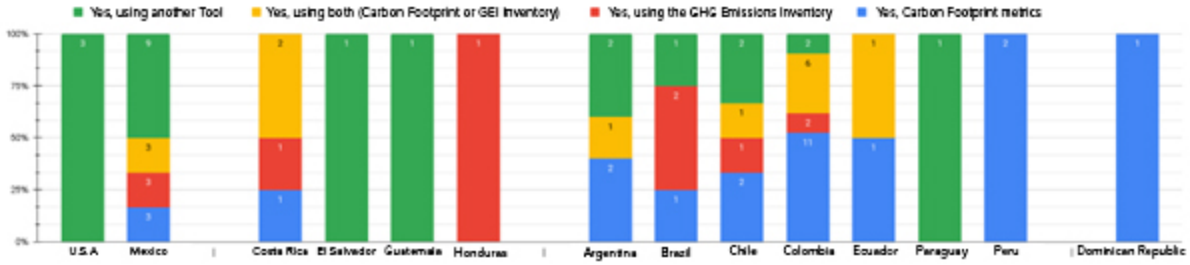
Figure 24. Percentages of HEIs that have or have not made an emissions diagnosis. n=219



Source: Climate Action Survey for Latin America and the Caribbean 2021.

The diagnosis and measurement of GyCEI emissions is usually the first step that informs many processes and policy initiatives for climate action within HEIs and other bodies such as cities, municipalities, states, provinces, and departments. Additionally, the measurement of GyCEI is a tool for didactic analysis and research that can be combined with other methodologies and reference frameworks such as the carbon footprint. Within the subset of institutions that said they had developed some type of emissions diagnosis (70), there is diversity in terms of what each HEI proposes as a combination of carbon footprint and emissions diagnostics has been used.

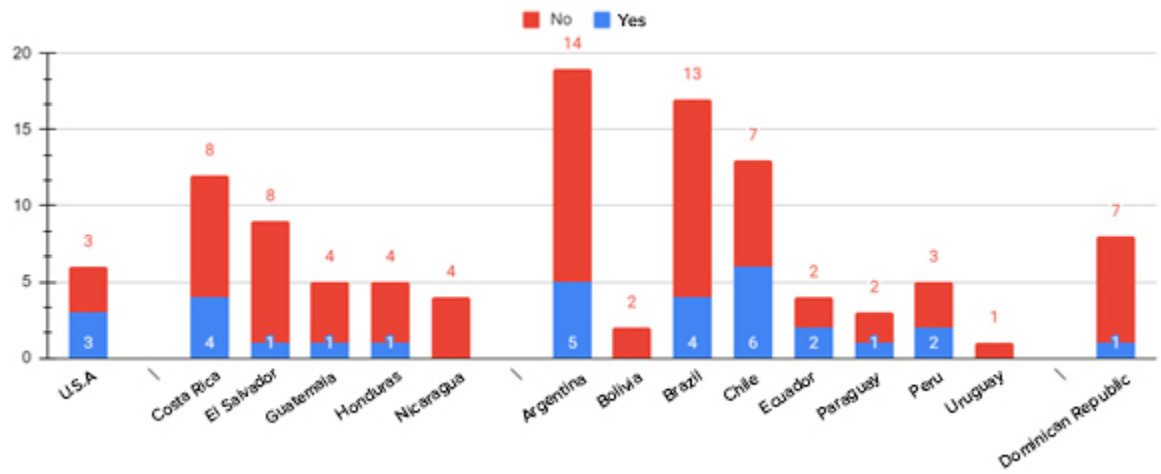
Figure 25. Frequency and percentage of HEIs by type of emissions diagnosis. n=70



Source: Climate Action Survey for Latin America and the Caribbean 2021.

Broken out by the country, there are some HEIs that take a more direct path towards the elaboration of metrics and targets that result from the establishment of GyCEI baselines. This baseline GyCEI provides significant support for program capacities, financing, planning and leadership to implement GyCEI's emissions targets.

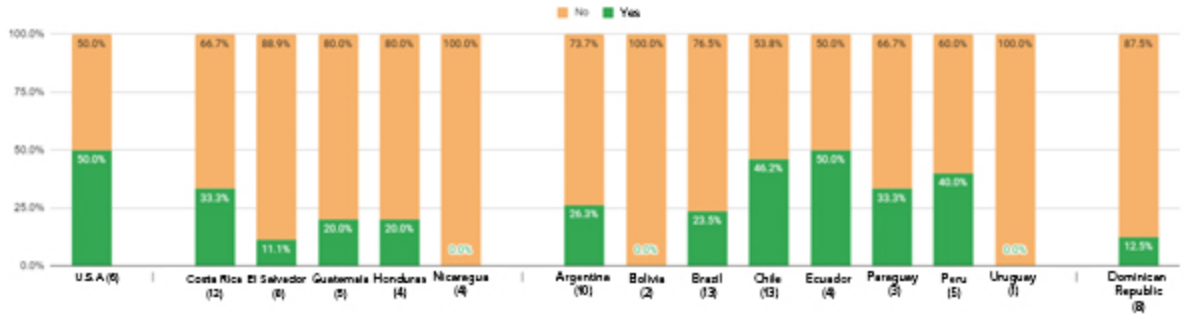
Figure 26. Frequency of HEIs that do or do not have an emissions diagnosis. n=219



Source: Climate Action Survey for Latin America and the Caribbean 2021.

In general, most HEIs are the initial and intermediate stages of diagnosing GyCEI emissions, where the HEIs of Chile, Ecuador and Costa Rica stand out.

Figure 27. Percentages of HEIs that do or do not have an emissions diagnosis. n=219



Fuente: Climate Action Survey for Latin America and the Caribbean 2021.

In which areas are Greenhouse Gases and Compounds Generated in Latin American HEIs

To design climate acceleration actions in Latin American HEIs, it is first critical to identify the areas in which Greenhouse Gases and Compounds (GyCEI) are generated within university facilities. *Urban university campuses are typically substantial producers of greenhouse gases and compounds either through operations or research activities. There is little research on this topic, especially for the context of countries in transition (Yusoff et al, 2021).*

In some cases, the scale of an institution may not be broad enough to be considered as high generators of GyCEI. However, even in low-scale infrastructure contexts; the measurement of GyCEI and the design and development of ad hoc metrics for climate action represents a good practice to understand strategic variables of climate action for their socialization and internalization by the largest number of actors within the institution.

In general, of the one-third of HEIs that do carry out their carbon footprint metrics -or are currently in the process of doing so-, the distribution of inventories of Greenhouse Gases and Compounds shows a significant predominance of the transport sector, followed by buildings and facilities and waste generation, probably with some similarity to what happens in the Latin American cities and metropolises where they are located.

It is in these three areas - transport, buildings and facilities and waste generation – that 90% of GyCEI emissions are concentrated within these institutions. From the outset, these overall results offer significant areas of opportunity for accelerating climate action through the direct involvement of student

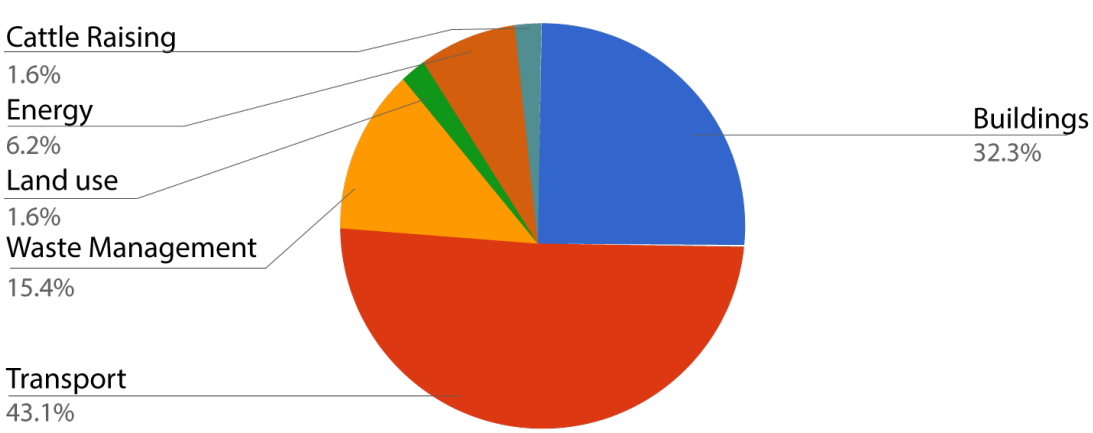
and teaching communities, especially through comprehensive waste management and energy efficiency processes within university facilities, including the adoption of renewable energy technologies, such as solar panels.

The issue of transportation transcends broader systems and structures at the city and community level, directly linked to the campus as the main center of activity from which origin-destination programs, collective transport, non-motorized mobility, and student housing can be implemented.

Finally, the issue of comprehensive water management, the sustainable management of treatment plants, wetlands, and water footprint, as well as land uses for adaptation and carbon sequestration and other environmental services, provide an adequate niche to carry out mitigation and adaptation policies in the face of climate change for the coming years in HEIs in Latin America.

As at national and regional scales, it is important to use these inventories to identify the mitigation measures that result in the highest rates of cost-effectiveness. The inventories of GyCEI constitute an excellent tool to define the lines of intervention of the HEIs for the purposes of climate policy within the campus.

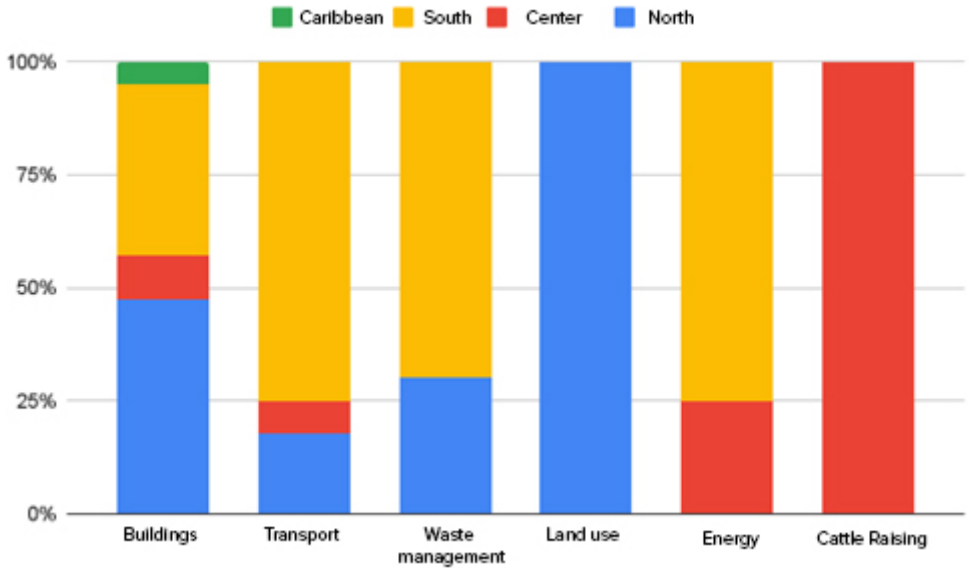
Figure 28. Activities with greater impact on emissions according to the diagnoses of the HEIs. n=70



Source: Climate Action Survey for Latin America and the Caribbean 2021.

At the regional level, there are interesting contrasts in terms of the sectors that are sources of GyCEI emissions. For example, the emission factors associated with livestock prevail in the HEIs participating in the survey located in Central America. Within Central America, the HEIs located in the South of the region present a diversification of emissions in the energy, waste management, transport, and emissions sectors. The subsectors of buildings and land use are more linked to HEIs located in the northern area of the continent.

Figure 29. Activities with greater impact of emissions according to the diagnoses of the HEIs by region. n=70



Source: Climate Action Survey for Latin America and the Caribbean 2021.

CASE STUDY II . *UNIVERSITY CARBON NEUTRALITY IN CHILE: THE SUSTAINABLE CAMPUS NETWORK*

In 2016, the Chilean Sustainable Campus Network was formed, made up of 30 HEIs of diverse institutional nature and regional distribution. The work of the Network consists of consolidating a platform for inter-institutional reflection oriented towards actions and solutions related to education for sustainability in the regional context of Chilean HEIs.

The atmosphere prior to the COP 25 to be held in Santiago de Chile generated an important momentum at the political, institutional, and social level of the Andean country. Thus, in 2019, within the framework of the preparatory work for COP 25, a series of structural change processes for climate action were determined at the level of the national political and discursive agenda, including legislation (National Law on Climate Change) which in turn encouraged the participatory involvement of various actors, among them and especially the Chilean universities associated with the network.

Since then, and as a consolidation of previous years' work on university sustainability, the Chilean higher education sector has been key in the lead for climate action initiated in 2019 and which was consolidated with the signing of the Climate Emergency Charter as the Governing Document. This global initiative was led by the international organizations Second Nature, The Alliance for Sustainability Leadership in Education and the Youth and Education Alliance of the United Nations Environment Programme.

At that juncture, eight universities of the Sustainable Campus Network of Chile decided to take the lead for climate action and sign the Climate Emergency Charter, a far-reaching guiding document that commits to the increase of climate ambition from Chilean higher education institutions, from which strategies, actions and roadmaps are derived from Chilean universities to effectively address the current climate emergency. In particular, commitments were to mobilize more resources for action-oriented climate change research and skills building; commit to becoming carbon neutral by 2030 or 2050 at the latest; and increase the delivery of environmental and sustainability education through curriculum, campus, and community outreach programs.

Among the strategies in which the Network of Chilean Universities has focused on the design and implementation of decarbonization routes through different methodologies, the collaboration with the Huella Chile program of the Ministry of the Environment stands out, which has allowed the generation of protocols for quantifying the carbon footprint at the university level in the national territory.

Additionally, the universities associated with the Chilean Sustainable Campus Network work continuously on the prioritization of climate action projects through six main criteria and working groups: Diagnosis, Comparative Analysis, Metrics, Projections, Mitigation and Offsets.

The main strengths identified in this joint effort have been the ability to generate a space for reflection and joint learning based on common values towards climate action even though the participating HEIs come from a regional, institutional diversity and even with different approaches to climate action but with a common goal: share, scale and catalyze mutually beneficial experiences for climate action.

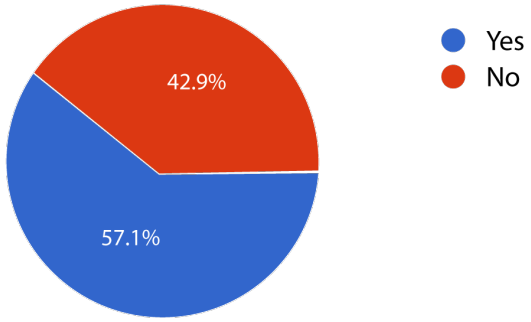
One of the main challenges that the Network has faced consists of how to generate revenue from the various routes of action, and

additionally, how to shape its plan and route to carbon neutrality, depending on the nature and diversity of higher education institutions.

Deliberative Platforms for Climate Action within HEIs

In terms of participatory climate action, the vision that HEIs reflect in their strategic documents is as important as its implementation. Ideally, climate action plans should be developed through some type of collegiate body or deliberative platform (councils, committees, units) where members agree on and make decisions about climate action with the inclusion and representative participation of university communities. That is where student enterprises arise; where local research is put into practice and where restrictions and areas of opportunity in administrative management are evaluated. **The majority of HEIs surveyed (57%) have some deliberative group or arena for climate action.** This type of collegiate body is strategic since it must provide feedback on the evolution in policies and guidelines for climate action, the management of scenarios, risks, thresholds, and strategic objectives that, ultimately, will be translated into goals and indicators.

Figure 30. Percentage of HEIs that have implemented inclusive institutional bodies to inform climate action

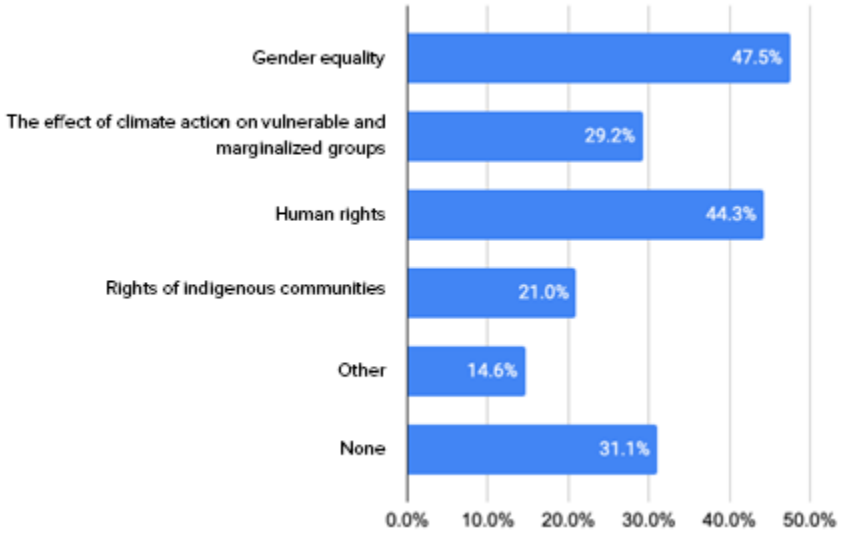


Source: Climate Action Survey for Latin America and the Caribbean 2021.

Cross-Cutting themes for Climate Action in Higher Education

A set of important issues to be discussed both in this type of committee - and in general in the institution - has to do with the issues directly linked to climate action (mitigation, adaptation, and resilience), and the integration with other cross-cutting issues such as gender equality, human rights, indigenous rights and the effects on vulnerable populations and groups in the institution. In this sense, **gender equity and human rights are the cross-cutting issues most often incorporated into the agenda of Latin American and Caribbean HEIs in relation to climate.**

Figure 31. Percentages of HEIs that incorporate these additional themes into their climate initiatives. n= 219



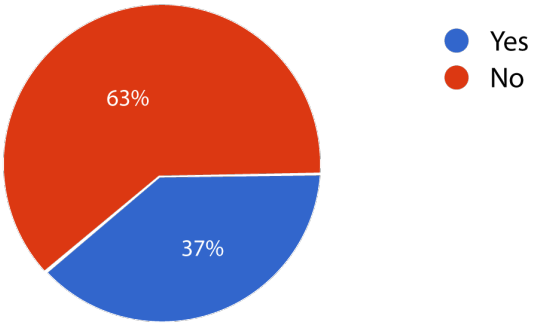
Source: Climate Action Survey for Latin America and the Caribbean 2021.

The breadth and scalability of climate action inside and outside HEIs depends, to a large extent, on the ability to align and integrate climate action within other transversalities that are already carried out in the university context, such as the issue of gender equality, human rights, and safeguards for indigenous populations. Sometimes it is necessary to hand-weave lines of action that establish connections between these transversal themes and enhance their impact.

It is striking that the connectivity/transversality with the issue of the involvement of youth and climate action is still scarce in the HEIs of Latin America and the Caribbean: Beyond the fact that most HEIs present some actions of involvement of students in environmental actions that lead indirectly to the issue of climate action, for example, the integral management of waste, it is convenient to "raise the rank" of the participation of young people for climate action to a scale similar to gender equality, human rights and safeguards in vulnerable populations so that in this way there are communication centers with greater impact through international networks, such as *People for the Planet.*

Sometimes the actions undertaken in the field of climate action have significant impacts on the economic and social environment of the university population. The variety of climate action projects is significant in their diversity and consistency. 37% of HEIs indicated that they have carried out research on the economic or social impact of their climate plan.

Figure 32. Percentage of HEIs that have carried out research on the economic and/or social impact generated by their climate action. N=219



Source: Climate Action Survey for Latin America and the Caribbean 2021.

CASE STUDY III. *TRAINING FOR SUSTAINABILITY AND CLIMATE CHANGE IN HIGHER EDUCATION IN ARGENTINA: THE NETWORK OF ARGENTINE UNIVERSITIES FOR ENVIRONMENTAL MANAGEMENT AND SOCIAL INCLUSION (UAGAIS NETWORK)*

The Network of Argentine Universities for Environmental Management and Social Inclusion (UAGAIS Network) is an initiative made up of 35 public universities and 4 private universities, throughout the 7 regions that make up the Argentine territory. This Network emerged in 2017 as a response to the need to coordinate efforts and establish alliances around sustainability in the country's higher education sector.

Between 2015 and 2017, with the leadership of the University of Buenos Aires (UBA) and the involvement of several public universities, the UBA promoted the creation of the Network within the framework of a project presented to the Ministry of Education of the Nation, achieving the support of both the Ministry and an important call for public universities and, subsequently, from private universities interested in joining the Network.

Since 2017, the UAGAIS Network has sought to promote actions that involve all members of the university community: managerial, administrative teaching and student staff, around five axes: 1. Government and environmental participation, 2. Teaching and environmental training, 3. Environmental research and technology, 4. Extension and environmental projections, and 5. Environmental management.

Currently, the UAGAIS Network also has the support of the Ministry of the National Environment and is an active member of the Alliance of Ibero-

American Networks of Universities for Sustainability and the Environment (ARIUSA), with the collaboration of the United Nations Environment Program (UNEP).

Among the actions promoted by the UAGAIS Network, the main ones are: Diagnosis of the institutionalization of the sustainability perspective in higher education, b. Regional workshops for the construction of the National Strategy of Sustainability in Argentine Universities (ENSUA) c. Definition of the National Strategy of Sustainability in Argentine Universities (ENSUA) as a contribution of universities to the National Law of Environmental Education and the Law of Integral Training in Environment for people who work in the public service, also known as the Yolanda Law, in honor of the former Minister of Natural Resources and Human Environment of Argentina Yolanda Ortiz, and d. courses on sustainability at Argentine universities, which include topics on climate change.

The main strengths of the UAGAIS Network are the capacity of articulation of the public and private HEIs that make it up, as well as its regional coverage, and the capacity for dialogue with other actors such as the relevant national ministries and the Alliance of Ibero-American Networks of Universities for Sustainability and the Environment (ARIUSA). Likewise, the Network has made important contributions by influencing public policy and nurturing the national debate on sustainability in universities, as well as contributing to the framework of the ENSUA, where reference is made to the ENSUA in Art. 2 of the National Law on Environmental Education published in 2021.

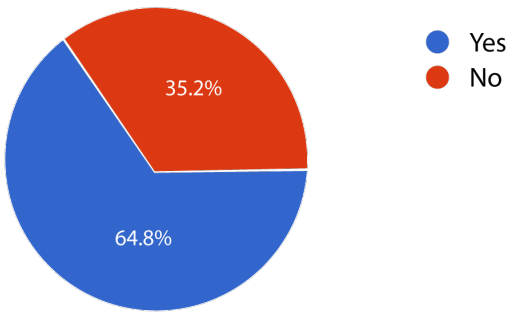
On the other hand, the main challenges that arise for the UAGAIS Network are 1) the consolidation of the Network through the integration of the diversity of approaches, visions, resources, and capacities of the HEIs that make it up, 2) compliance with the indicators that frame the actions of the Network in each of the member HEIs, and 3) strengthening collaboration between the Network and other actors, such as civil society.

Sustainable Development Goals in the HEIs of Latin America

The UN Sustainable Development Goals are a frame of reference par excellence to incorporate climate action into the routines and processes of Latin American HEIs. Two out of three institutions already have institutional designs that formally incorporate the SDGs into their strategic functions and into their instruments and lines of action. The challenge is to establish metrics in line with SDG 13 of Climate Action in the academic context and link it with the rest of the SDGs and the Agenda 2030 within the HEIs.

Although the targets and indicators of SDG 13 present a more macro-oriented approach, it is recommended to adapt and design specific indicators based on the local context in which the institution is located. In many cases, the adoption of the Sustainable Development Goals platforms and the 2030 Agenda have been precursors to the establishment of fine-tuned and effective strategies for climate action.

Figure 33. Percentage of HEIs incorporating an SDG-based framework into their planning, executive and/or strategic activities. n=219



Source: Climate Action Survey for Latin America and the Caribbean 2021.

The Covid 19 Pandemic in the Context of HEIs

The current context of the Covid-19 pandemic has changed the ways that many substantive functions within educational organizations are carried out at a global level. Many of these modifications have, in principle, the potential to accelerate climate action within Latin American HEIs.

The key factor in determining the possible favorable effects and co-benefits because of the new Covid 19 context is based on the substantive changes in behavior tending **towards** the reduction of carbon emissions in the new university context. Given this, the participating HEIs are aware of the implications of this structural condition in the institutional educational work. Particularly important in the Covid context is the virtualization and hybridization of courses and teaching activities. The impacts in terms of the metrics related to ecological footprints and emission sources identified in previous sections depend to a large extent on this.

7 out of 10 HEIs surveyed indicate that the continuous trend has already migrated towards hybrid organizational processes with impacts that are, in principle, potentially favorable for climate action, if the "leaks" and translation of environmental costs at the household level are properly accounted for. In this area, the processes of awareness and environmental education should also be expanded.

Figure 34. Percentage of HEIs according to the strategies planned for the Covid-19 pandemic

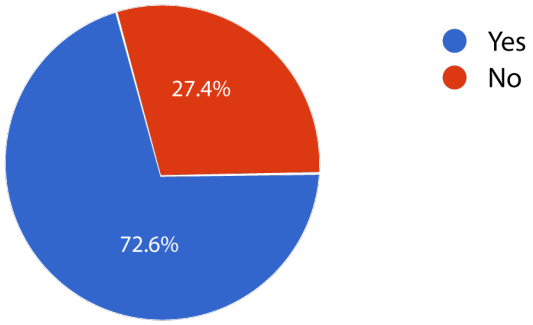
Answer	Frequency	Percentage
Mostly we will return to normal after the pandemic	48	21.9%
A hybridization of organizational processes will be carried out	156	**71.2%**
A radical shift towards online platforms and courses will take place	12	5.5%
Another answer	3	1.4%
Total	219	100%

Source: Climate Action Survey for Latin America and the Caribbean 2021.

This environment that permeates the current situation is linked to the expectations of reducing GyCEI emissions within HEIs in Latin America, which present a favorable perspective for the current action: **73% of the participating HEIs consider that their higher education institution does actively promote the**

reduction of GyCEI. This coefficient, although relatively high, does not necessarily imply a roadmap towards decarbonization or carbon neutrality. **That is, most HEIs in Latin America carry out important efforts for climate action, but not necessarily at the level needed – to avoid more than 1.5 degrees of warming with respect to pre-industrial levels. This implies that there are still significant areas of opportunity for Latin American HEIs in terms of increasing climate ambition.**

Figure 35. Percentage of participants that promote reduction of energy use and GYCEI emissions in their institution. n=219



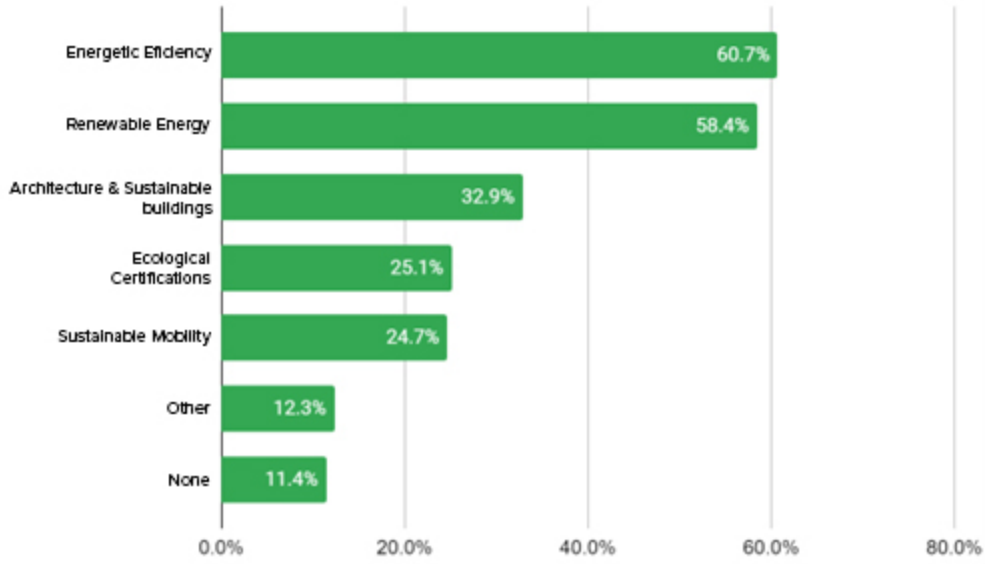
Source: Climate Action Survey for Latin America and the Caribbean 2021.

The majority of the HEIs surveyed indicate a determined attitude towards the reduction in energy consumption with a view to reducing GyCEI, through a wide spectrum of action policies, among which stand out not only the already traditional - but not trivial - implementation of energy efficiency actions and energy certifications, but also the inclusion of more complex processes such as the incorporation of renewable energies and sustainable architecture and buildings, sustainable mobility.

One of the most efficient and visible ways to identify climate action processes in mitigation within Latin American HEIs is under the project approach. **Most of the projects considered for climate action within the HEIs are concentrated in 5 broad categories: energy efficiency; renewable energy; environmental certifications; sustainable mobility and sustainable architecture and buildings.**

These 5 major areas have their own methodologies, challenges, and complexities individually; but they can also be conceptualized as a set/basket of integrated actions that achieve important effects if they can be implemented synergistically. A small percentage (12%) of the HEIs surveyed are still in an initial stage of design and implementation of mitigation measures, so they can choose from the range of possibilities that have been adopted by other HEIs in Latin America, identifying the challenges involved in each of them and their adaptation to the local context.

Figure 36. Frequency of HEIs according to the mitigation actions they have undertaken. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

It should be noted that the issues most often experienced can also be understood as *opportunities* for seeking joint solutions among Latin American HEIs, many of which have already undertaken robust and cost-effective energy efficiency actions.

Renewable energies have also been pushed strongly on many campuses in recent years. It is also observed as a trend that various ecological certifications have been adopted by HEIs as a tool to contribute to different components of climate action. Certifications depend mostly on national environmental regulation, but they can indirectly contribute to awareness and action in the face of climate change.

Finally, sustainable mobility and sustainable building and architecture also represent great opportunities for HEIs in terms of mitigation and adaptation to climate change. **HEIs with an academic community of more than 100,000 people represent the size and functions of an average city, including daily mobility in public transport - both traditional and low-emission - motorized and non-motorized private transport.** Even intra- and inter-campus mobility represents large areas of opportunity for emissions reduction. For example, there are many participating HEIs that have replaced their official vehicle fleets with hybrid and electric models in recent years.

According to the testimonies of some Latin American HEIs, the most notable barriers that were identified for the adoption of mitigation measures within the HEIs themselves are the following: the lack of unification of internal criteria on the prioritization of actions against climate change, disassociating between institutional management units for the implementation of sustainability and climate action projects, and the co-creation of a culture of climate action that often presents resistance in the early stages between different elements of the organization.

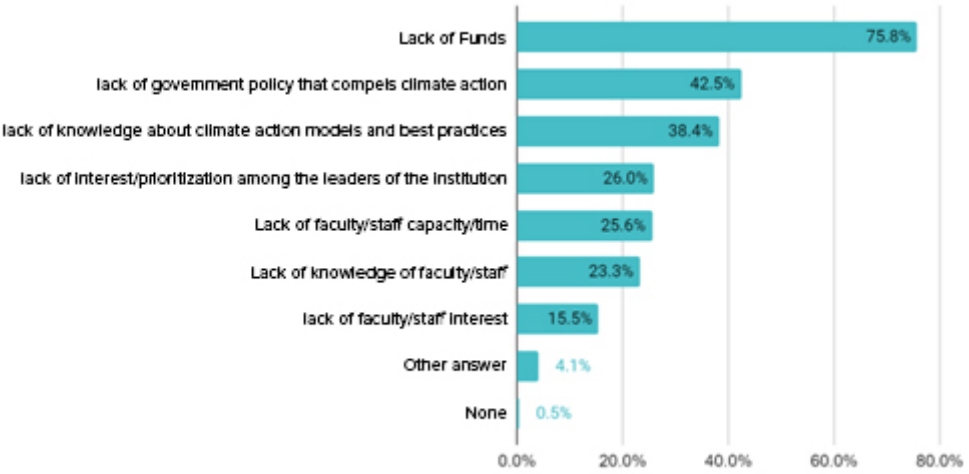
Seen as a tool, the measurement and reduction of the ecological footprint within the HEIs presents its own methodological and management challenges, which involve financing from agreements with specialized partners, homologation, compatibility and comparability between the diversity of tools that currently exist for carbon footprint measurement and, above all, the internalization of these tools by students, teachers and administrative staff under inclusive, transversal and intersectional participatory and pedagogical approaches that eventually move to larger communities, such as the housing of the university community.

Within the qualitative responses to the survey, there are certain energy efficiency actions that appear with frequency. For example, several HEIs mentioned the replacement of air conditioning and lighting equipment, the addition of solar panels in some areas of the campus and the installation of efficient electrical and water measurement and monitoring systems. Some HEIs point out that these actions are often very positive, but isolated, and still require the development of comprehensive building management systems linked to multidimensional and multilevel coordination models in the institution.

Barriers and Challenges for Climate Planning in HEIs

The main barriers to climate planning within HEIs, in addition to the central theme of climate finance, concern other underlying factors and enabling conditions that are likely to cause an insufficient institutional ecosystem to promote climate action. These factors are related to the links between government policies, knowledge bases, the adoption/penetration of the climate issue and the prioritization of climate action as a central theme in the institutional strategic objectives.

Figure 37. Main barriers and challenges to climate planning. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Again, it is identified that many HEIs in Latin America and the Caribbean do not yet have a Climate Change Program at the institutional level. However, many already have – or are about to implement – a Comprehensive Environmental Management System through which actions are implemented to reduce negative environmental impacts identified on campus. This instrument may well provide a foundation for transition to specific and more ambitious climate action instruments, such as carbon budgets or GyCEI inventories.

Identifying the main challenges preventing climate planning in HEIs can help to guide decision-making as institutions evaluate the types of actions and interventions that would have the most impact. In this sense, the most frequent barrier indicated among the respondents refers to the management of funds for climate financing within HEIs. However, this barrier may only be the symptom of a set of shortcomings, such as the low level of expertise on the part of the teaching staff, weak support of government policy at the local or national level, or the lack of leadership on climate action. Frequently, this lack of enabling conditions can be overcome through strategic alliances with other higher education institutions.

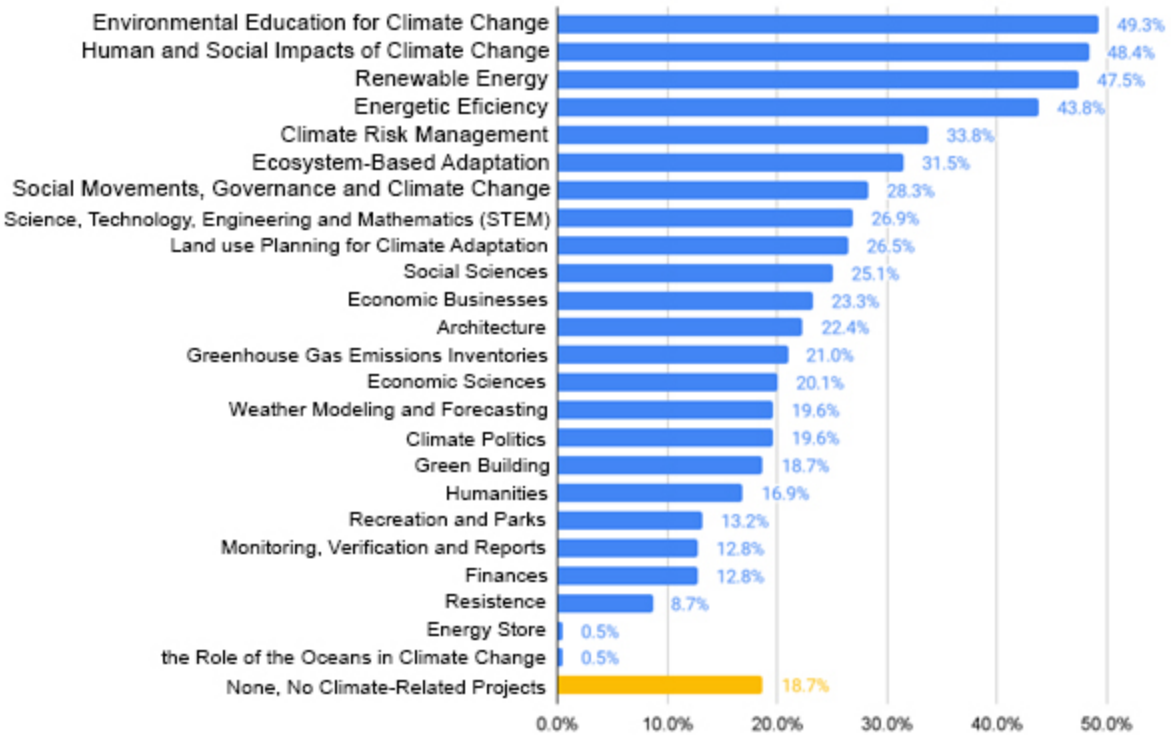
4. Research

This section explores the fundamental role of the research carried out by HEIs in social transformation. This is done in a global and local context and includes increasing the capacity of future professionals and decision-makers to solve problems that interact and impact on climate change and the Sustainable Development Goals (SDGs).

According to the results of the survey, approximately 3 out of 4 higher education institutions have ongoing research projects on some aspects of climate action. There is a high diversity, variety and depth of research topics that have been developed by HEIs in Latin America in relation to climate action in recent years.

In fact, according to the survey, in total there are 25 climate action issues that are currently on the *research agendas* within the HEIs of Latin America. The 5 most frequently cited topics on climate action by HEIs are: Environmental education for climate change, energy efficiency, human and social impacts in relation to climate change, renewable energy, and climate risk management.

Figure 38. Research Projects implemented in the HEIs. n=219

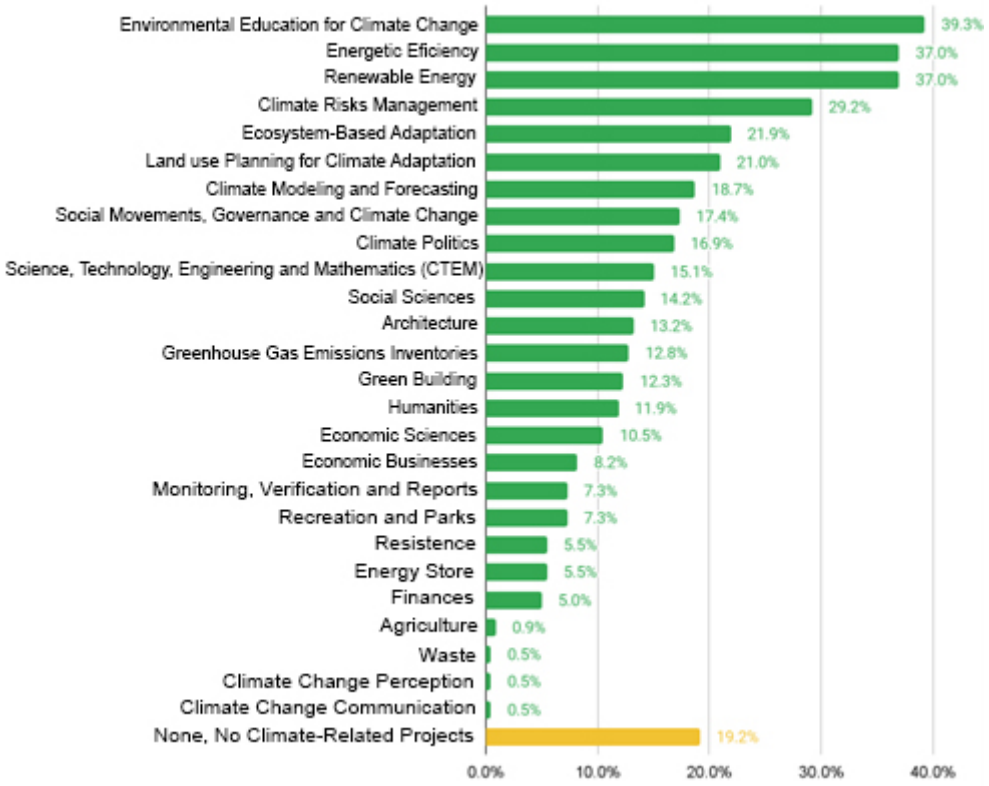


Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

To carry out research projects in the different themes, 50% of HEIs with research on the subject indicate that they have strategic alliances linked to external actors, especially non-governmental organizations. It is important to note that, according to the results of the survey, close to 20% of HEIs have not implemented research initiatives on climate action in recent years. Further investigation is needed to determine the reasons for this result. Possible factors include the institution's size, budgeting, overall research amount, management model, and/or the structures of its academic plan.

The three main areas of research for climate action in line with mitigation for climate action are: climate change education, energy efficiency and renewable energy. There are emerging issues that are gaining strength around climate adaptation, climate resilience and governance for climate action. These issues have gained importance in the research agendas of HEIs in Latin America in recent years and in some cases have been institutionalized in methodologies or concrete instruments such as: climate risk management, land use planning for climate adaptation projects and ecosystem-based adaptation.

Figure 39. Research Areas developed in the HEI. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

The graph shows the thematic diversity on which climate action can and should be addressed according to the distinct research model pursued by each institution. Climate action research has been addressed more from environmental and earth sciences, biology, agriculture, and forestry. However, there are an increasing number of fields that address climate problems starting with engineering and technology and extending into the social sciences, arts, humanities, architecture, design, and communication sciences.

In accordance with the tradition in sustainability sciences, HEIs should prioritize research that emphasizes the process of developing innovative solutions to existing problems related to climate action. This moves research from basic knowledge to knowledge for real-world problem solving. HEIs should select appropriate forms of experimentation for climate action and opportunities for intervention in specific contexts for climate action, always aspiring to transformational methods for problem solving (Caniglia et al, 2017). In particular, the integration of social sciences for translational research is crucial. This can be based in the community using participatory methodologies and direct involvement between scientists and actors (Eisenhauer et al, 2021).

One type of structure that integrates interdisciplinary research for climate action in higher education institutions is through research centers. The evolution of sustainability centers around university campuses can be seen as part of a larger process of integrating sustainability and climate change into the research and curriculum. Sustainability centers can be considered as niches within universities when they try to create scientific and organizational conditions for inter and transdisciplinary education and research. The biggest challenge is to figure out how these centers can lead efforts in relation to other areas of the campus, and in accordance with their campus's own models and organizational cultures (Soini et al, 2014).

CASE STUDY IV. *E-BIO – CENTER FOR RESEARCH IN CIRCULAR BIOECONOMY. AUTONOMOUS UNIVERSITY OF BUCARAMANGA (UNAB)*[9]

The ε-BiO - Center for Research in Circular Bioeconomy of the Autonomous University of Bucaramanga (UNAB) is made up of the Environmental Unit and the Biotechnology and Environment Group of the UNAB. The Centre combines efforts in research, development and innovation, and its intersection with the environment, society, and the productive sector.

This Center collaborates closely with other research groups within the UNAB, namely: the Resource, Energy and Sustainability Research Group (GIRES), the Energy and Mechatronics Research Group (GICYM), the Biomaterials Laboratory of the Faculty of Health, the Information Technology Group (GTI), the Applied Sciences Research Group (GICAP), the Systemic Thinking Group, and the UNAB-Transformative initiative (UNAB Ambiental, 2021). Through these research and work groups, the UNAB Climate Action Plan (CPO) is designed and developed, which is aligned with the Sustainable Development Goals (SDGs) (UNAB Environmental, 2021).

In the field of research, the Center conducts projects mainly related to five areas, some of which have been strengthened in the last five years: a. Greenhouse gas emission inventories, b. Social movements, governance and climate change, c. Energy efficiency, d. Environmental education for climate change, and e. Renewable energy (Meneses, 2022; Diaz, 2022).

The Center has promoted various strategies around climate action, including:

- The integration of climate issues into academic courses or programmes by creating new content from learning units that include the Sustainable Development Goals (SDGs) and their intersection with climate action. They have also produced additional elective courses for sustainable development, the SDGs and/or climate change, and the launch of new workshops and seminars on climate change
- The Participation of the Center in massive open online courses (MOOCs) on sustainability and climate change, in collaboration with other HEIs in the

[9] Para información adicional véase: Díaz, C. and Meneses, A. in Berger, M. and Busch, U. (2022) *Encuesta para la Acción Climática en América Latina y el Caribe.*

ε-BiO - Centro de Investigación en Bioeconomía Circular, Universidad Autónoma de Bucaramanga (UNAB). Disponible en https://www.youtube.com/watch?v=meaPTFkdUrE

region, as well as in the Sustainable Development Solutions Network (SDSN)

- The offer of content on climate change in undergraduate and postgraduate programs such as life cycle analysis courses, and Water-Energy Nexus (in the master's degree in Engineering)
- The Center has designed and disseminated educational materials on environmental sustainability and climate change, through talks and conferences open to the public (Meneses, 2022)
- Community and student community awareness of climate change has been promoted in the areas of renewable energy technology, agricultural resilience/sustainability, circular or regenerative approaches, and carbon reduction.

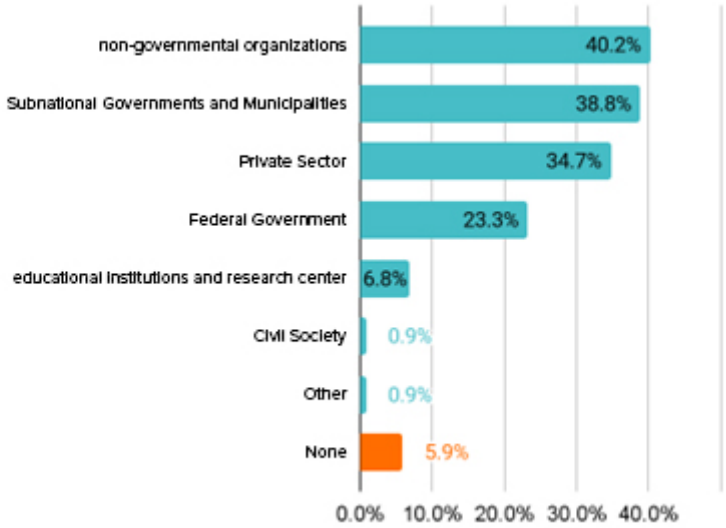
Currently, the Center collaborates closely with different actors to promote projects around climate action at the local, national, and international levels, including subnational governments, non-governmental organizations, agencies, and international organizations such as the United Nations, World Bank (WB) and Inter-American Development Bank (IDB), as well as representatives of various productive sectors.

Among the challenges faced by the institution to boost its participation in climate action are the lack of knowledge, capacities, resources, infrastructure, management, interest and time of staff in general (Díaz, 2022; Meneses, 2022). The articulation between institutions and initiatives coordinated by different actors is still incipient. The absence of a Climate Action Plan has hindered access to opportunities and financing mechanisms for climate action and therefore its creation and adoption is one of the current institutional priorities (Meneses, 2022).

Collaborative Research and Dissemination Networks for Climate Action.

Collaborations for climate action are very frequent between HEIs and governments, the private sector, and non-governmental organizations (around 40%) and relatively scarce through inter-institutional relations between HEIs and academic networks. Inter-institutional collaboration is a major opportunity from which cooperation between HEIs must be built according to criteria of competitive advantages. Building partnerships that generate knowledge exchanges for climate action are the first step in scaling collaborations and building learning communities.

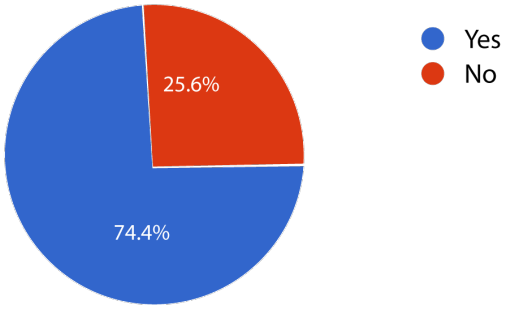
Figure 40. Collaboration for climate action. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Frequently, climate action and sustainable development are characterized by the construction of environmental governance, which has as two of its main properties the being multi-actor and multilevel (Aguilar Villanueva, 2019). That is why it is not atypical to form simultaneous alliances between more than two of the actors illustrated in the graph. Additionally, the desire for dissemination of project results related to climate action to external stakeholders is relatively high with nearly 75% of reported respondents considering their HEI to be committed to external projects.

Figure 41. Percentage of participants who consider their HEI to be committed to external climate/climate action initiatives or projects. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

CASE STUDY V. RESEARCH IN ACTION: *THE INTERDISCIPLINARY OBSERVATORY ON CLIMATE CHANGE, STATE UNIVERSITY OF THE RIO DE JAINERO*

The Interdisciplinary Observatory on Climate Change (OIMC) of the State University of Rio de Janeiro was created in 2020, with the support of the Institute of Climate and Society. The OIMC brings together a broad university community made up of professors, researchers, students, and graduates of political science, international relations, sociology, and oceanography. This OIMC focuses on the promotion and dissemination of research, the generation of knowledge relevant to the design of policies and practices on climate change, and its intersection with social development and transformation at the local, national, and international levels (OIMC, 2021).

The work of the OIMC in its three areas of action (research, capacity building and policy) is directed towards five purposes: 1) To raise awareness about climate change among the university community; 2) To develop research projects at local, national and international levels; 3) To promote the production of interdisciplinary knowledge on climate change; 4) To build capacities in the field of climate change and development; and 5) To offer of continuous and professionalizing education for different actors inside and outside the university. These purposes produce and disseminate didactic materials and tools with an interdisciplinary and intersectoral approach, relevant to the formulation of public policies on climate change and contribute to the discussion on environment and society that underlies these purposes (OIMC, 2021).

The research conducted by the OIMC integrates the collaborative work of local and international researchers on various topics, including: Analysis of the official discourse on climate change, European Green

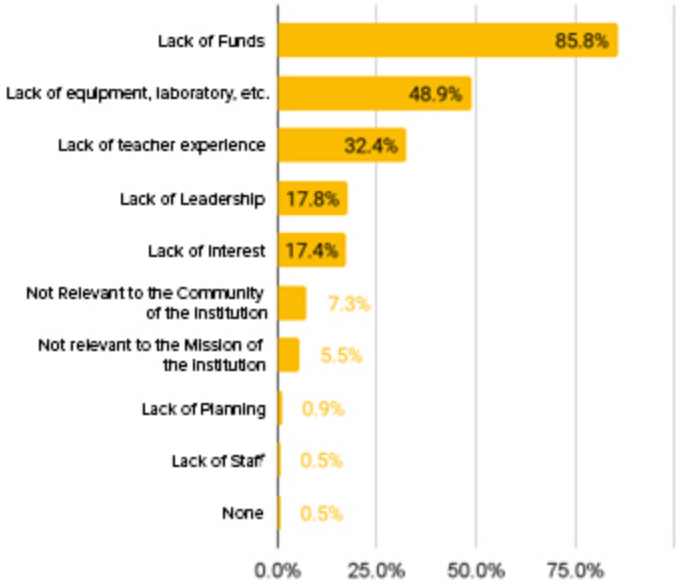
Agenda: institutions and society, social theory and climate change, socio-environmental impacts of Chinese investment in Brazil: the case of the Amazon and the social construction of the environment (OIMC, 2021).

In terms of capacity building, the course offerings are mainly aimed at undergraduate, graduate and undergraduate students and university graduates, and focuses on the environment agenda and its intersection with international relations, climate change, politics and society, and democratic crisis and international politics. The OIMC offers a space (interviews) to opinion leaders, expert voices, and representatives of different sectors to talk about the challenges of climate change and the initiatives that can respond to these challenges. Likewise, the OIMC has the publication “Cadernos do OIMC” where different issues of the local, national, and international climate change agenda are addressed, through the knowledge and expert opinion of researchers, professionals from the public and private sectors, civil society, activists, and journalists. Finally, the OIMC is part of important international networks of experts on the climate change agenda, namely Climate Alliance Brazil (ACA Brazil) and Climate Social Science Network at Brown University (United States of America).

Barriers and Challenges for Research and Climate Action

The main challenges and barriers preventing further investment in climate action-related research are the lack of funding, the lack of research teams and laboratories, and the limited experience and knowledge of faculty regarding climate change. The latter is an area of great opportunity for the coming years in terms of faculty training in climate action science and research, and the corresponding development of new programs related to climate change.

Figure 42. Main challenges for climate-related research. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

CASE STUDY VI. *INNOVATION, DESIGN THINKING AND CLIMATE CHANGE AT THE UNIVERSITY OF MANIZALES, COLOMBIA*

The University of Manizales is an institution that is distinguished by its active involvement in the global climate action agenda, through specific local strategies. Within the University, it is the Directorate of Institutional Planning that is responsible for promoting climate action policies. The University has launched workshops and seminars on climate change, and work has been promoted among teachers to produce educational materials on climate change. The University has organized climate courses in collaboration with other HEIs, MOOCs focused on climate action, and promoted the mobility of teachers and integration into the Sustainable Development Solutions Network (SDSN) (Restrepo, 2022; Vargas, 2022). Research activities, on the other hand, are focused on studying the human and social impacts of climate change, climate risk management, social movements, governance and climate change, and environmental education for climate change. Projects such as the ERASMUS + Climate Labs Project are signature initiatives for the University for the "strengthening of applied research and innovation capacities in Latin America through co-creation laboratories for mitigation and adaptation to climate change" (UdeA, 2021).

Within the framework of a European Union funded project, the University of Manizales set up in 2021 a Social Innovation Laboratory for Climate Change that promotes education and training for sustainable development, and research and innovation to respond to the local, national, and global challenges that climate change brings. This initiative is coordinated by the Center for Research in Environment and Development (CIMAD) of the Faculty of Sciences, Accountancy, Economics and Administrative. Other research conducted by CIMAD also includes the study for the University Network of the Americas and the Caribbean for Disaster Risk Reduction (REDULAC/RRD), on vulnerability and risk maps (Vargas, 2022).

Community participation is a critical component in the realization of these and other actions against climate change, which is why the University of Manizales promotes community involvement in sustainability initiatives on and off campus. This includes forums and workshops around the environmental justice agenda, agricultural resilience and sustainability, carbon reduction and water management. In addition to local communications, the university's collaborative ties with other actors such as subnational governments, the private sector, non-governmental

organizations, and international organizations are important to implement projects that contribute to climate action, such as the Climate Lab project.

The challenges faced by Higher Education Institutions (HEIs) in Latin America and the Caribbean when it comes to promoting actions against climate change are not alien to the University of Manizales. At the institutional level, the lack of resources (funds) or the low availability of these, and the lack of knowledge about the funds available, is one of the main obstacles to advancing this agenda. Additionally, the lack of knowledge of the faculty and administrative staff, the lack of interest and prioritization of the issue among the leadership of the institution, and the lack of knowledge about climate action models and better practices all limit program effectiveness. In teaching and research on climate change, the challenges are mainly associated with the lack of interest, knowledge, and experience of a large part of the teaching staff, the lack of interest and motivation of the student community, government policy, and the lack of infrastructure. At the regional level, the greatest challenges to accelerating climate action are associated with access and availability of technical, financial resources and the articulation of efforts and actors within and outside the university community, the generation of development and research projects, citizenship education and the promotion of community participation.

5. Education

"Education plays a key role in raising awareness and promoting the behavioral changes necessary for mitigation and adaptation to climate change. It increases the capacity to mitigate and adapt to climate change or by enabling individuals to make informed decisions" (Reid, 2019).

Towards Interdisciplinary Education for Climate Action.

One of the most common practices regarding formal education on climate change is the inclusion of the topic of climate change into different existing courses, curricula, and programs.

Figure 43. Integration of climate issues curricula of academic courses and/or programmes

Answers	Frequency	Percentage
There has been no integration of climate issues into the curricula of academic courses or programmes	25	11.4%
Some professors have integrated climate issues into the curricula of academic courses or programs	135	61.6%
Most teachers have integrated climate issues into academic course curricula.	16	7.3%
HEI has implemented a cross-cutting strategy to integrate climate issues into appropriate curricula	43	19.6%
Total	219	100%

Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

On the other hand, 19.6% of HEIs have initiated a cross-cutting strategy with academic programs interacting in an interdisciplinary way. This includes an internal dissemination component to popularize the climate issue, sometimes in combination with the Sustainable Development Goals. This finding suggests that there is a large area of opportunity to promote climate change programs throughout the institution.

Figure 44. Ways in which climate issues have been integrated into the curricula or academic programs of the n=194 courses.

Answers	Frequency	%
Creation of new content of learning units that include the SDGs and/or climate action.	100	51.5%
Introduction of specific courses related to climate change in various academic programs.	89	45.9%
Introduction of additional selective courses for sustainable development, the SDGs and/or climate change.	83	42.8%
Launch of new workshops/seminars on climate change.	88	45.4%
Development of new specific undergraduate and graduate programmes.	75	38.7%
I work among colleagues at the institution to produce educational materials on climate change.	61	31.4%
Curricula reformed to include the SDGs and climate change as a central cross-cutting element in programmes	36	18.6%
Total responses	194	100%

Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

While **there has been a perceived push to include climate change in the curriculum of HEIs, it is also evident that these initiatives are scarce, fragmented and mostly carried out under a disciplinary approach without a clear strategy to push it forward in other disciplinary programs.** International evidence indicates that a highly effective mechanism for nesting climate education in the university curriculum is through the common core or as a requirement of general studies (Hess & Maki, 2021). *Additionally, the North American evidence indicates that among the best practices for incorporating the subject of climate change in the curriculum, the following stand out: the inclusion of a basic course required for all students; a clearly designated group of courses related to climate change as part of the common core courses, and a transparent menu of courses that include climate science or climate change education across the institution (Hess & Collins, 2018).*

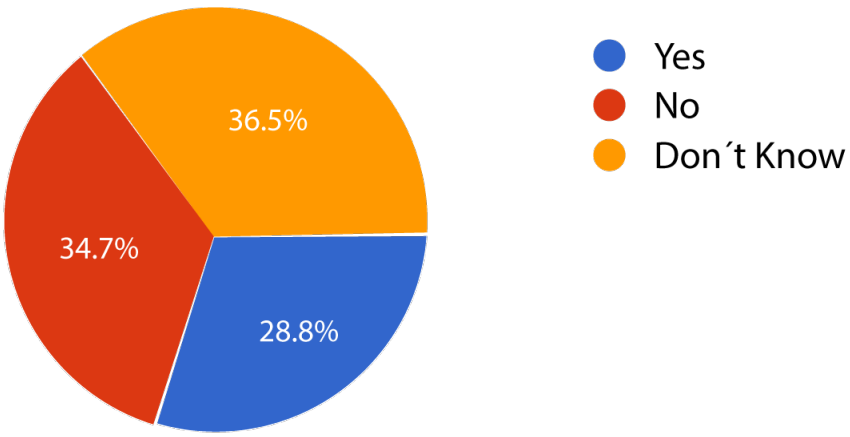
The responses also highlighted **how** to integrate climate issues into curricula under the inter, multi and trans-disciplinary approaches. 20% of the HEIs that answered the survey question are currently in the process of curricular reform (or have recently carried it out), where climate change is included as a central component as part of the process.

A curriculum reform is not always feasible or even convenient in the short term. Therefore, HEIs are pursuing other organizational strategies such as the development of new programs, the creation of new course content, elective courses, and interdisciplinary peer-to-peer learning opportunities.

HEIs seem to be finding their own ways to incorporate climate change into their core curricula, teaching strategies, and thematic content in a wide range of academic programs, but much remains to be done. It should also be noted that HEIs are making efforts to bridge the gap between theoretical and practical programs through workshops and interdisciplinary content review by academic peers. Although the specific content and themes of these initiatives are often very broad and contextualized to local conditions, open responses show that we can explore some specific experiences that may be replicable.

A crucial issue – which is currently a part of the international curricular discussion – is the introduction of climate change into the curriculum through the interdisciplinary integration of the so-called hard sciences with the social sciences, humanities, and other areas of knowledge.

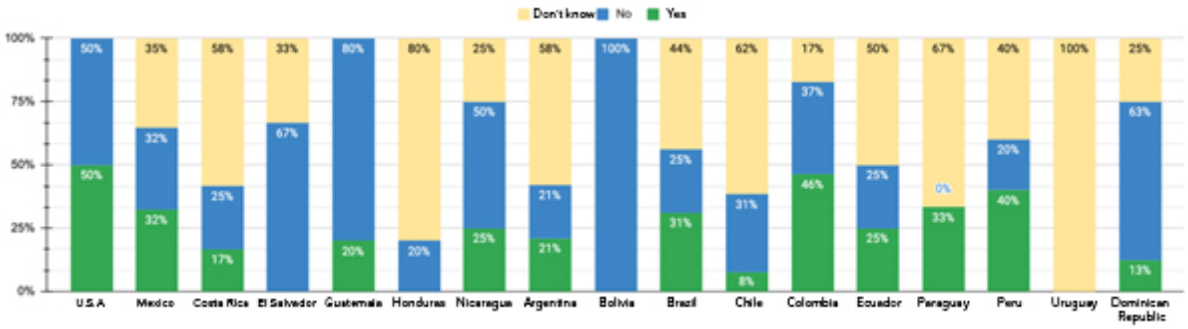
Figure 45. Interdisciplinary integration for climate action at the HEI. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Around 30% of HEIs have initiated interdisciplinary academic processes that integrate both epistemic perspectives into a joint curriculum with different degrees of realization. The other 70% of HEIs are either not working on this integration or it is still in process. These efforts vary greatly among the HEIs surveyed and the relative frequencies at the country level, as seen in Figure 46, are notable.

Figure 46. Percentage of HEIs per country according to response: *Has your institution made efforts to create an interdisciplinary integration of the "hard sciences" and the "social sciences and humanities"?*



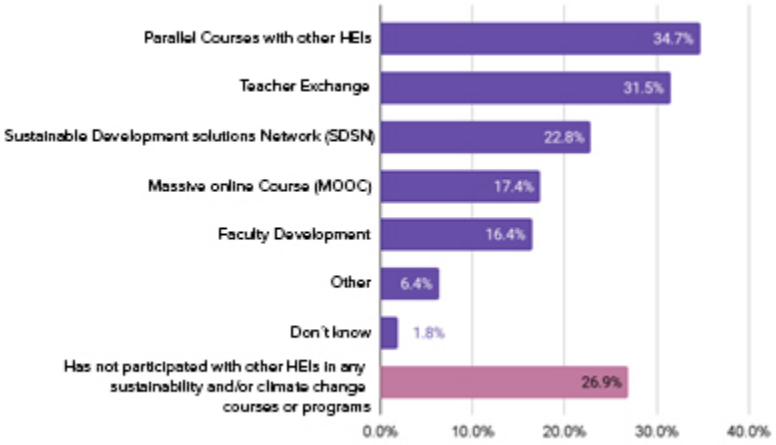
Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Academic Programs, Courses and Training Modalities for Climate Action

Innovative teaching modalities have been used at many of the HEIs. More than a third of the HEIs surveyed have developed parallel online courses, which consist of the same course being offered in two or more institutions simultaneously and collaboratively both in its design, implementation, and evaluation. Approximately 18% of HEIs have launched so-called MOOC (Massive Open Online Courses) with topics directly or indirectly related to climate change from different disciplinary perspectives.

In addition, exchange programs specific to climate action are also taking place. Approximately one third of HEIs have participated in teacher exchange programs on climate change issues. Exchanges offer spaces for educational innovation, co-creation and promote design thinking approaches to climate change.

Figure 47. Frequency of HEIs according to the type of link with other institutions in courses and / or programs of sustainability and / or climate change

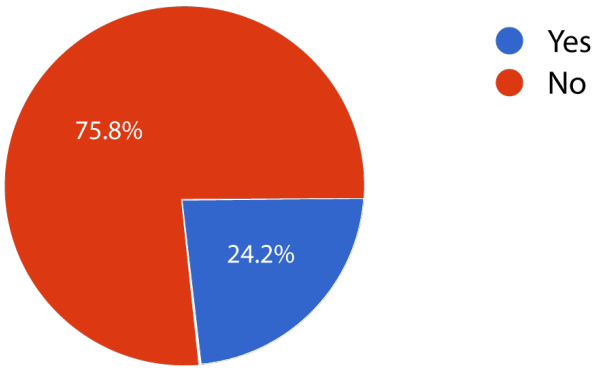


Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Teacher training and learning communities are two other strategies to amplify climate action: **17.4% of HEIs have invested in teacher development efforts in MOOC-type climate change courses and 23% participate in international sustainable development networks such as the Sustainable Development Solutions Network (SDSN).**

Many HEIs need to implement programs directly related to climate change, both at undergraduate and postgraduate levels, for educational goals to be met. **Only 24% of HEIs reported that they offer an undergraduate climate change program.**

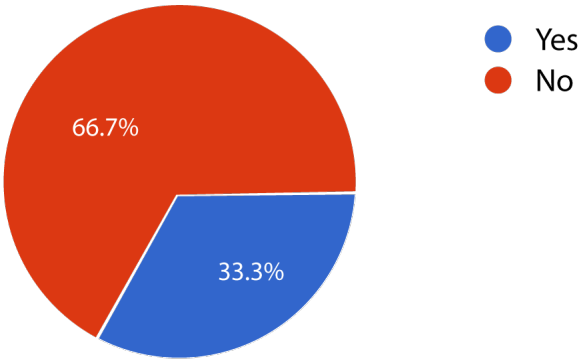
Figure 48. Percentages of HEIs offering a climate change program at the undergraduate level



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

A slightly higher percentage of institutions have climate change programs for graduate students with 33% of HEIs reporting an academic program at that level. This may be due to the greater flexibility, specificity, and relative adaptability of programs compared to those at the undergraduate level.

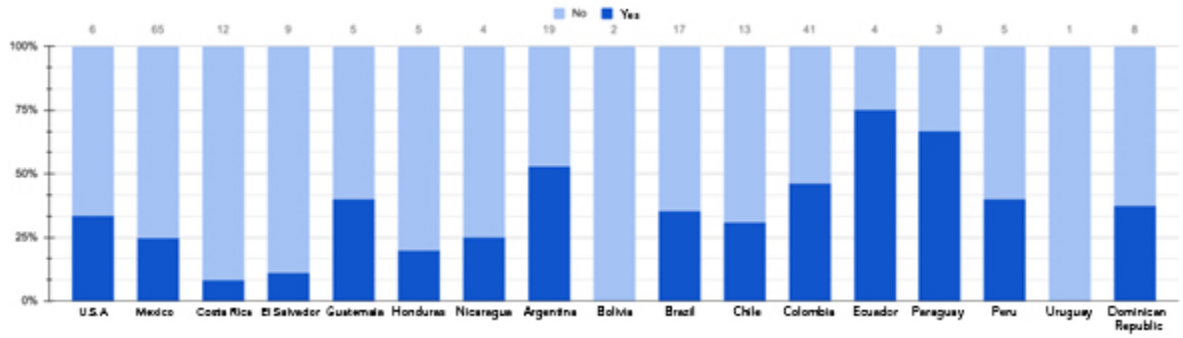
Figure 49. Percentages of HEIs offering a climate change program at the graduate level



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

The frequencies of climate change programs at the country level vary proportionally among the countries participating in the survey. Although in many cases the number of observations is low, some interesting data are observed, such as the case of Ecuador, where three of four HEIs that responded stating that they had a graduate climate change program.

Figure 50. Percentages of HEIs offering a climate change program at the graduate level per country.



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

A challenge for HEIs is the design of physical learning environments. Long-term learning (required for climate action) involves both active construction by the individual and input by the surrounding environment. The university campuses of many of the HEIs in Latin America and the Caribbean provide excellent learning environments for climate action that must be adapted for this purpose with existing physical attributes and, sometimes as a process in ongoing development (Budwig, 2015).

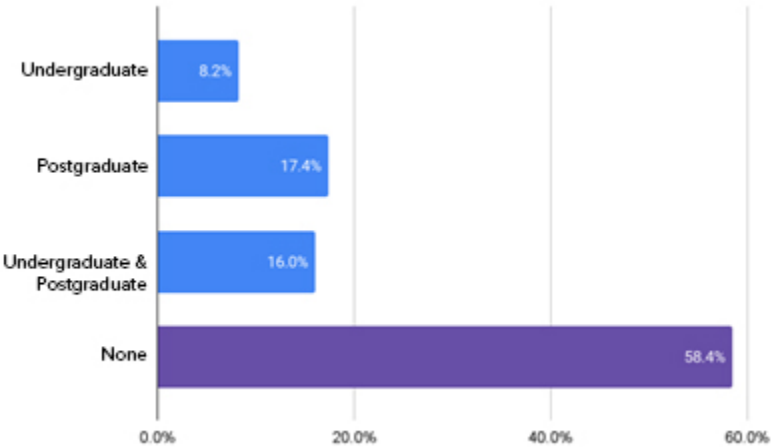
The evidence also shows that educational interventions are more successful when they focus on local, tangible, and actionable aspects of sustainable development, climate

change and environmental education, especially those that can be addressed through individual behavior. This can foster adaptive skills related to a changing topic in a larger context around 21st century lifestyles. These skills include critical thinking, problem solving, and interpersonal and multidisciplinary collaboration. (Anderson, 2016). It is through engaging in meaningful deliberations, interacting with scientists, challenging misconceptions, and implementing community projects that the complexity of climate action can best be addressed in educational curricula (Monroe et al, 2017).

The Challenge of Integrating Climate Change into the Curriculum.

Implementing climate change programs at the undergraduate level is not an easy task in part due to its interdisciplinary nature. This requires dialogue and consensus among various departments or academic units. Additionally, it requires vision, leadership, commitment among the disciplines, instructors, and directors of education. Sometimes there are some barriers to consolidate this type of effort: It could be that there are not enough instructors to offer specialized courses in climate change issues. It could also be that there are administrative, managerial, governance, or legal restrictions on implementing these programs in the short term. It is precisely because of this type of limitation that there is a need and desirability to simultaneously promote more flexible and innovative curricular initiatives such as MOOCs, teacher exchanges and mirror courses between regional HEIs.

Figure 51. Percentages of HEIs that offer a climate change program at the undergraduate and/or graduate level.

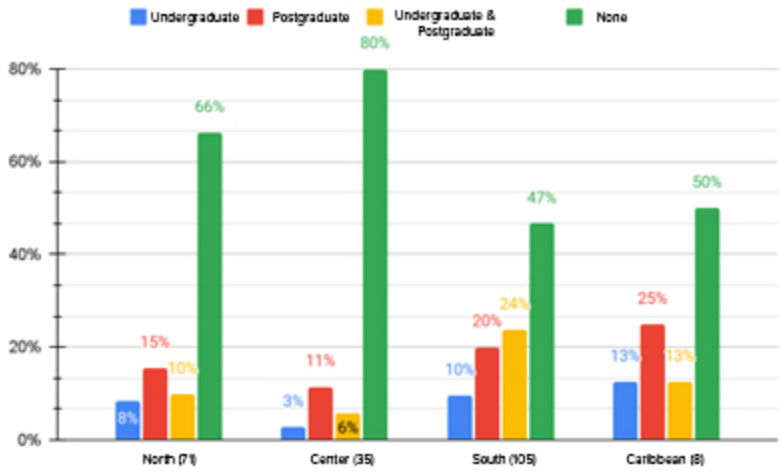


Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

At a qualitative level, some HEIs recognize the existence of isolated activities through a single faculty or department that takes the initiative, but this does not impact at institutional levels as there is no "culture of climate change". **Breaking this inertia**

of fragmentation represents a key question for climate action within HEIs in LAC and represents a challenge in the field of international higher education (see, Leal Fihlo et al, 2018. *op. cit.*).

Figure 52. Percentages of HEIs offering a climate change program at undergraduate and/or graduate level by region.



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

CASE STUDY VII. *THE APPROACH TO CLIMATE CHANGE FROM AGRICULTURAL SCIENCES: THE PAN-AMERICAN AGRICULTURAL SCHOOL, ZAMORANO (EAP ZAMORANO)*[10]

The Pan-American Agricultural School, Zamorano (EAP) in Honduras was established in 1942 with the mission of promoting professionals in the conservation of natural resources, rural transformation, and the development of agricultural and agro-industrial industries (Zamorano, 2021). EAP developed a theoretical-practical approach that allows its students to "learn while doing" and develop skills and abilities necessary for their labor insertion in the fields of education, research, or industry.

The most important measures promoted by the EAP to address the climate change agenda consists of water resource management strategies, projects to mainstream the issue of climate change in the curriculum, and community planning and innovation in the development of improved drought-

[10] Para mayor información véase:: Tenorio, E. in Berger, M. and Busch, U. (2022) *Survey on Climate Action in Higher Education in Latin America and the Caribbean.*

Escuela Agrícola Panamericana, Zamorano (EAP Zamorano). Disponible en: https://www.zamorano.edu/

resistant seeds. Part of these actions have been carried out with the collaboration of international actors such as Swiss government, which is very active in the Central American region. At EAP, this cooperation has been channeled towards curricular mainstreaming processes in the last decade and has had an important impact on seventeen other HEIs in Honduras.

Likewise, the substantive extension service functions of the EAP are done through knowledge dissemination and continuing education that the institution directs to neighboring rural communities. The EAP, like other HEIs in the region, also faces various challenges in addressing the climate change agenda. These challenges are mainly associated with two areas of action, namely: the lack of time availability, and lack of interest of teaching and administrative staff to accelerate the participation of the EAP in climate action. Limitations also include the lack of access to opportunities and financing mechanisms for the promotion of climate actions. This lack of engagement may also be due to ignorance about the existence of learning opportunities, and the basic lack of expertise and experience in the field of climate change by teachers (Tenorio, 2022).

CASE STUDY VIII. *CLIMATE CHANGE TRAINING FROM THE PERSPECTIVE OF SOCIAL SCIENCES: THE LATIN AMERICAN FACULTY OF SOCIAL SCIENCES (FLACSO)*[11]

The Latin American Faculty of Social Sciences (FLACSO) is an institution dedicated to the "generation of knowledge, teaching and dissemination of knowledge of the social sciences" with a presence in thirteen Latin American countries (FLACSO, 2022). FLACSO's academic offerings are made up of specializations, master's degrees, and doctorate degrees, as well as specific courses. In the field of climate change, the Specialization in Law and Economics of Climate Change and the master's degree in Law and Economics of Climate Change offered at the headquarters in Argentina are particularly notable, as well as the Specialization in Leadership, Climate Change and Cities in Ecuador. FLACSO Brazil offers a Training Course on Environment and Society, while FLACSO Chile includes among its offerings the course "Public Policies for

[11] Para mayor información, véase: Facultad Latinoamericana de Ciencias Sociales FLACSO. Disponible en https://www.flacso.org/

Plataforma de Aprendizaje en Inversión Pública y Adaptación ante el Cambio Climático (IPACC). Disponible en https://www.plataformaipacc.org/

Climate Change", and "Higher Diploma Climate Change: ethical challenges for public policies". FLACSO Uruguay is also part of this educational offering with "Specialization in Gender, Climate Change and Disasters", and the "Seminar on Climate Change and Gender".

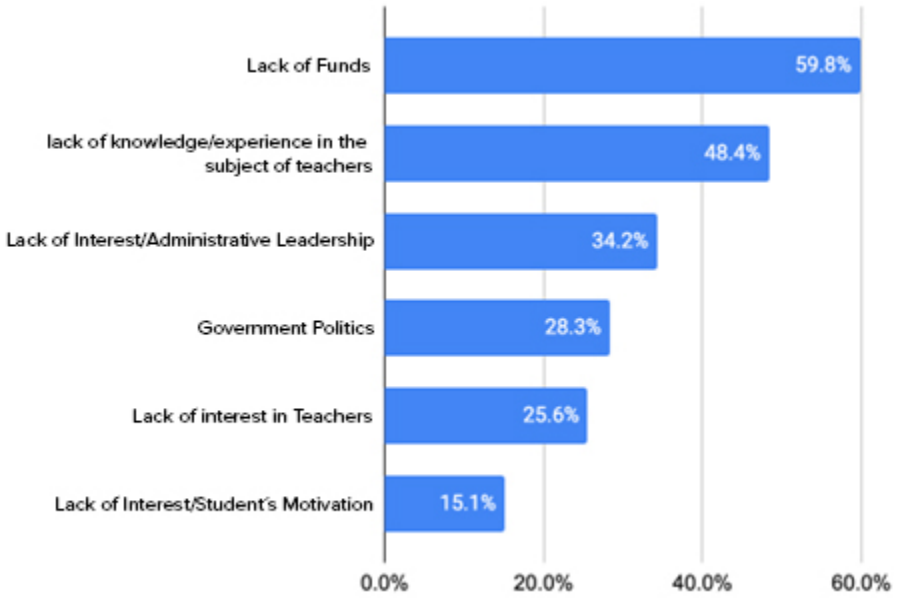
FLACSO Argentina, through its virtual FLACSO platform, has a wide range of online courses on climate change, in collaboration with climate policy makers at the national and international levels. The range of topics addressed covers the intersections of climate change and cities, climate change and international law, climate change, mitigation and development, climate change and politics, as well as climate change economics. Additionally, one of FLACSO's flagship projects is the Learning Platform on Public Investment and Adaptation to Climate Change (IPACC), coordinated by its General Secretariat, within the framework of the Study Program on Tailor Risk and Climate Change, and with the collaboration of the German Agency for Development Cooperation (GIZ).

This virtual platform has been conceived as a space for capacity building aimed mainly at decision makers and technical professionals, around disaster risk management and adaptation to climate change, within a framework of "sectoral public investment projects" in Brazil, Colombia, Costa Rica, Peru, Dominican Republic, and Uruguay (FLACSO, 2022). This platform also houses a virtual library with audiovisual resources on the intersection of climate change and public investment. FLACSO, together with other HEIs and research centers, are part of the Regional Network on Climate Change and Decision-Making – UNITWIN Program of United Nations Educational, Scientific and Cultural Organization (UNESCO) and Fundación AVINA, which focuses on strengthening the "public and private decision-making frictions" related to climate change in Latin America (Unitwin Network on Climate Change and Decision Making, 2021). Finally, FLACSO's research lines include Territorial Development and Environment, which covers climate change as one of its main themes.

Barriers and Challenges for Research and Climate Action

The most important challenges that prevent the integration of climate issues into an institution's curricula and/or academic programs are represented in Figure 53.

Figure 53. Challenges for a climate curriculum in HEIs



Fuente: Survey on climate action in higher education in Latin America and the Caribbean, 2021

Institutions face restrictions relative to curriculum reform that are both internal and external. **Internally, decisions on curricular reforms must go through multi-level collegiate bodies which examine the relevance of new content in the curricula, creating barriers to the incorporation of climate themes into curricula.** In the presence of an institutional or organizational culture focused on sustainability issues, particularly climate change, these deliberative processes help ensure strong buy-in and input from across campus. However, sometimes, this context can create processes that are long and rigid. Given the complex and interdisciplinary nature of climate action, the ability to prioritize the change and see the process through to completion becomes problematic.

Externally, some HEIs expressed that the restrictions placed by accreditation systems at the state and national level are limiting, as they serve as regulatory bodies and quality certifiers of the courses and curricula of the various universities at the state level. It is thought that the issue of climate change may "compete" with the number of subjects included in the curricula. **The most frequent reported challenge to curricular and educational programs and climate change comes from external funding, lack of leadership, and the non-existent or incipient experience of teachers and the related learning curve that this effort requires.** This latest finding has important implications for institutional climate action planning to recruit, build capacity, build networked partnerships, and incorporate training courses to strengthen teachers' capacities.

CASE STUDY IX. *UNIVERSITY OF ANTIOQUIA (UDEA)*

The University of Antioquia (UdeA) promotes various climate action strategies through different spaces and in collaboration with different local, national, and international actors. In its Institutional Action Plan 2021-2024 (Plan), the UdeA has designated the Administrative Vice-Rector's Office as the coordinating entity of its university strategy for the "promotion of an environmentally sustainable culture, biodiversity and the health of the university community in and from the territories" (PAI, 2021). Within the framework of this strategy, various actions and projects are promoted around sustainability and climate education, environmental management, waste management, photovoltaic solar energy on campus, as well as diagnostics and climate data inventories. This Plan is also aligned with the Sustainable Development Goals (SDGs). It should be noted that in the process of building this Plan, the academic, student and administrative community of the UdeA was actively involved.

UdeA created an entity called Corporación Académica Ambiental (CAA), in collaboration with public and private organizations, environmental entities, and research groups attached to the university. CAA offers a wide range of training options on the environmental agenda, as well as courses, seminars, conferences, and other spaces for dialogue and professional exchange in this field (UdeA, 2022). Among its offer are the Diploma in Environmental Sustainability and Corporate Responsibility, and the Diploma in Climate Change. The latter integrates an inter and transdisciplinary approach, and consists of seven courses, namely: Introduction to the Science of Climate Change, Elements of Risk Management associated with Environmental Change, Impacts of Environmental Change on Ecosystems and their Services, Impacts of Climate Change on Coastal Regions, Impacts of Environmental Change on Public Health, and Policy Instruments for Climate Change Management and Climate Change Communication (Restrepo, 2022; UdeA, 2022). The staff that teach in support of this diploma is composed of scientists who have participated in the reports of the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Platform on Biodiversity and Technical Ecosystem Services (IPBES) (Restrepo, 2022).

The UdeA has promoted the international mobility of teachers to participate in sustainability and climate change programs in other HEIs. Some teachers have integrated SDGs and climate action into their curricula, courses, seminars, and workshops. UdeA has produced research, with a few projects on mitigation against climate change, some of them with the

participation of foreign HEIs, other Colombian universities and public entities in the country. The areas of knowledge of these research projects have been mainly human and social impacts of climate change, climate modeling and forecasting, land use planning for climate adaptation, climate risk management, ecosystem-based adaptation, energy efficiency and renewable energy.

It should be noted that the UdeA had significant participation in the publication of the report "Climate Change 2021: the basis of physical science", of the Intergovernmental Panel on Climate Change (IPCC), with the contribution of Dr. Paola Andrea Arias Gómez, professor and head of the Environmental School of the Faculty of Engineering. It has also participated in the latest reports of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). For its part, community participation in the actions undertaken by the UdeA on climate change has been notable, particularly around environmental technology, renewable energy technology, and climate resilience, mitigation, and adaptation, through sustainability initiatives on and off campus, and local and global sustainability issues. In addition, the active participation of local communities includes collaboration networks with other local and subnational governments, and multilateral cooperation spaces such as COP26, the IPCC and IPBES (Restrepo, 2022).

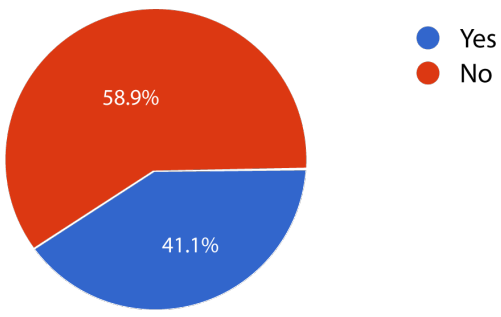
The main challenges facing the UdeA in its climate action efforts are the lack of funding at the local, state, national and Latin American levels that could accelerate policies, plans, programs, and projects in this area, as well as knowledge about where and how these resources can be managed. There is the lack of disciplinary articulation, faculty, staff capacity and time, as well as knowledge about climate action models, and best practices. Finally, with respect to the teaching and administrative community, the UdeA faces the lack of interest of a large part of the teaching staff for the integration of the climate change agenda in the programs and curricula, as well as the lack of interest and administrative leadership.

Training Strategies for Climate Action in the Human Resources of Administrative and Teaching Staff

Another important part of education within LAC HEIs is climate change training for administrative and managerial staff: **It is through the implementation of norms, rules, administrative and budgetary decisions that the implementation of climate action becomes a reality at the campus level.** The involvement of key actors, including the personnel directly responsible for the implementation of the measures of change for climate action within the campus, represents a crucial aspect of the development strategy towards the acceleration of climate action (Atherton & Giurco, 2011). Therefore, climate change awareness courses for workers and administrative staff can make a difference in improving the institutional performance on climate issues across campus. This includes many different interconnected areas that shape staff routines such as internal waste management, energy and water efficiency, green purchasing, energy management systems, landscape conservation, sustainable building projects, and campus transportation systems.

The survey reflects that 41% of HEIs in Latin America and the Caribbean have implemented climate change action/awareness programs for teaching and/or administrative staff. The contents of these training courses or short programs are very diverse. They range from urban gardens, awareness campaigns, reforestation campaigns, environmental management manuals and certifications for university workers or training for student ambassadors of climate action programs and SDGs.

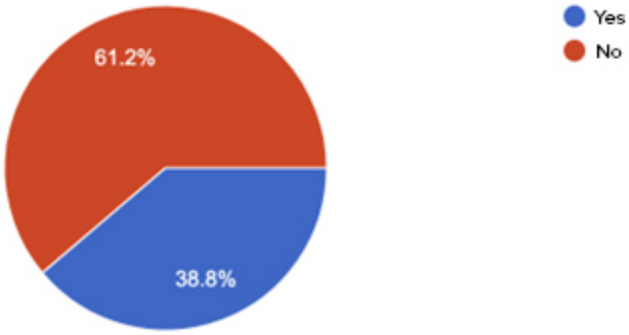
Figure 54. Percentage of HEIs that have implemented action programs with the institution's staff.



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

A similar trend occurs with the dissemination of opportunities for continuing education to local communities by HEIs. This is an important and relevant aspect of scaling climate change beyond campus. There are still significant growth opportunities in this area, since more than 60% of HEIs still do not have this type of initiative.

Figure 55. Percentage of HEIs with continuing education for climate



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

6. Promotion, Dissemination, and Participation

Local Outreach

Although on-campus climate action initiatives are crucial, and in some cases mandatory, the opportunities and challenges for climate action go far beyond campus, especially considering the role of HEIs as catalysts and enablers. In this sense, engagement, inclusion and co-participation with local communities and stakeholders in climate action initiatives, derived from or followed by HEIs in their own context – with a problem-solving approach – result in interactions that are crucial for mutual learning, outreach, participation and promotion of policy design and implementation.

Campus, curriculum, and community form a triangle that must be balanced to aspire to effective climate action by and within HEIs. Openness, participation, cooperation, and dialogue are important prerequisites for achieving effective climate action within HEIs, which forces us to think broadly, that is, beyond the physical limits of the campus to provide transferable models for adjacent communities (Müller-Christ et al, 2014).

This type of approach also allows HEIs to democratize research projects and translate them into local and context-based climate action projects, thus generating positive feedback loops between HEIs and local stakeholders that could strengthen and build trust over time. For example, experiences in the field of public health are informative for climate action. Efforts to change patterns of behavior, social norms, and the consideration of attributes at the level of local communities has required trust-building techniques and long-term outreach in communities. Effective climate action will require many of the same approaches. (Maibach et al, 2008). *In this sense, HEIs must implement communication strategies balanced between the aspects of mitigation and adaptation. They must also be able to generate credible long-term commitments with deep involvement because there is still much to investigate regarding the determinants of involvement in long-term climate action (Moser, 2010).*

Fortunately, the trend is clear and positive: a strong and growing 39% of HEIs responded that they have designed extension and/or continuing education opportunities for local communities directly related to climate change. Again, the set of experiences covers a wide range, from community plans for rural development and climate adaptation to the development of deliberative citizen science platforms or municipal climate action observatories.

CASE STUDY X. *THE AUTONOMOUS UNIVERSITY OF BAJA CALIFORNIA SUR (UABCS) MEXICO AND THE ACCOMPANIMENT OF LOCAL GOVERNMENTS*

In recent years, the Autonomous University of Baja California Sur (UABCS) has promoted projects related mainly to the human and social impacts of climate change, climate modeling and forecasting, climate risk management, greenhouse gas emission inventories, energy efficiency, environmental education for climate change, renewable energy, social sciences and humanities, and economic sciences. The UABCS developed the Program of Action against Climate Change in Baja California Sur, which includes the analysis of this issue from perspectives of the social sciences, engineering, and natural sciences, as well as actions to adapt to climate change in protected natural areas (Gámez, 2022). As a result, the number of theses related to climate change has increased significantly in recent years. It should be noted that the participation of students has been encouraged by crediting their authorship in the publications and providing remuneration with the support of international financing.

The UABCS has also assumed a very active role in cooperation at the local, national, and international levels. In the implementation of the various projects it promotes in the field of climate change, it collaborates closely with municipal governments, the National Commission of Protected Natural Areas (CONANP), the Ministry of Environment and Natural Resources (SEMARNAT), the National Institute of Ecology and Climate Change (INECC), as well as local civil society organizations, the United Nations Development Program (UNDP), the German Agency for Development Cooperation (GIZ), the Inter-American Development Bank (IDB) and the Intergovernmental Panel on Climate Change (IPCC). It should be noted that the collaboration of the UABCS with Civil Society Organizations (CSOs) for climate action has been key to achieving the rapprochement of agencies and international financing organizations such as IDB and GIZ.

On the other hand, at the state level, the UABCS coordinates the implementation of the Baja California Sur Regional Water Plan, a strategic instrument on the effects and future scenarios of climate change. This same work of coordination of planning instruments for state development was carried out in 2012, with the State Plan of Action against Climate Change for Baja California Sur (PEACC-BCS), with the participation of the Sustainable Development Commission of Baja California Sur. Also at the local level, the

university contributed to the elaboration of a Climate Action Plan for La Paz in 2017, under the auspices of the IDB Emerging and Sustainable Cities of Latin America, the International Community Foundation (ICF), and the Municipal Planning Institute (IMPLAN) La Paz. UABCS also contributed to the 2017 Climate Change Adaptation Plan for the Biscayne Biosphere Reserve, with the support of UNDP. Finally, the university collaborates with the Citizen Observatory ¿Cómo Vamos La Paz?, a multi-sectoral and multidisciplinary civil society organization that monitors public action in different areas, including resilience and climate change, and its impact on the sustainable development and quality of life of the population, with the support of the IDB's Sustainable Cities initiative.

This is an example of an HEI that has been able to build up solid collaborative relationships with their local key stakeholders for climate action throughout the years by connecting the international methodological and research world with the need and development of planning and policy instruments for climate action.

The Participation of University Communities in Climate Action

Historically, and especially after the Paris Accords, international grassroots movements have driven many climate initiatives around the world. The recent Conference of Parties in Glasgow devoted a special debate to youth groups, gender equality and climate change.

The participation of students and faculty through advocacy groups, arenas and participatory platforms and grassroots movements, non-governmental and governmental organizations at different scales, is a key component to the ignition of climate action at the campus level. Some advocacy processes are born within the HEIs themselves while others are derived from external climate action movements that already exist at local, regional, national, and international levels. Still others are nested in some HEIs, reflecting an external and internal combination of multi-stakeholder and multi-level domains of cooperation.

The level of student community engagement and participation is a complex variable to measure, which sometimes needs to be addressed subjectively.

Therefore, we asked HEIs in Latin America and the Caribbean how active they consider their own community participation in terms of climate action: On a scale of 1 to 5, the perception of commitment follows a normal distribution, with an average of 3 This finding can have several interpretations: In the first instance, the finding is somewhat surprising considering that some of the most influential recent climate action movements, generally and internationally speaking, have come from the young population, which would have led us to expect a higher level of active engagement among the student community. However, this may be because many of those international grassroots movements have originated in more economically developed countries, so it may be that levels of youth activity in climate action are related to a country's level of economic development and/or to the country's historical levels of carbon emissions.

Figure 56. Perception of student and teacher commitment to climate action in the institution.

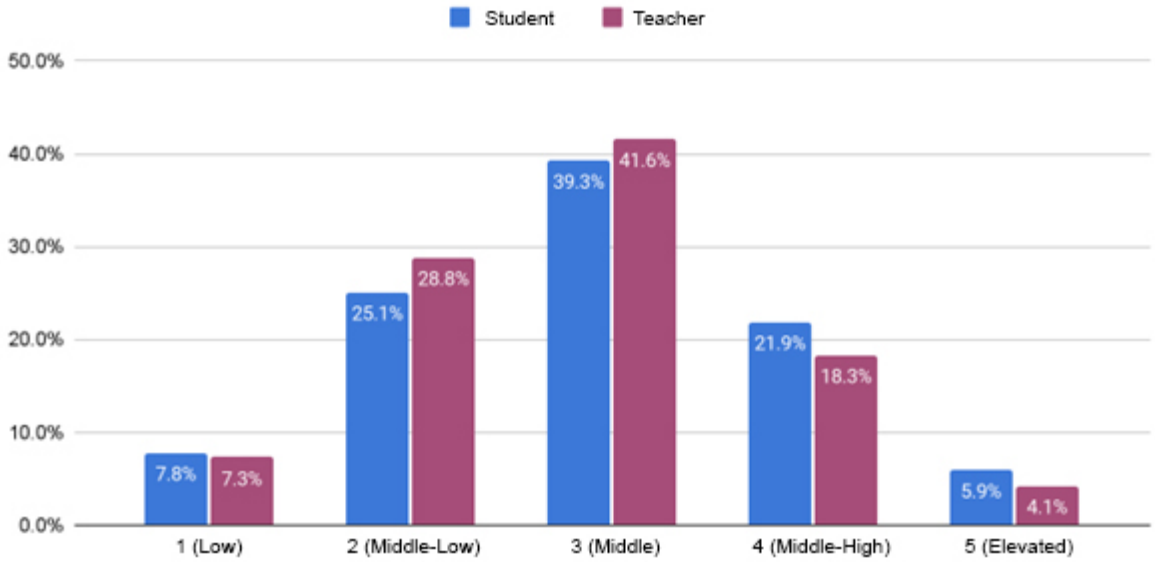


Figure 57. Average value of participation perception

	N	Average value of participation	Standard deviation
Student	219	2.93	1.009
Teacher	219	2.83	0.95

Figure 58. Average value of participation perception by region

	N	Student	Teacher
North	71	3.01	2.94
Central	35	2.69	2.66
South	105	2.95	2.82
Caribbean	8	3	2.75

Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

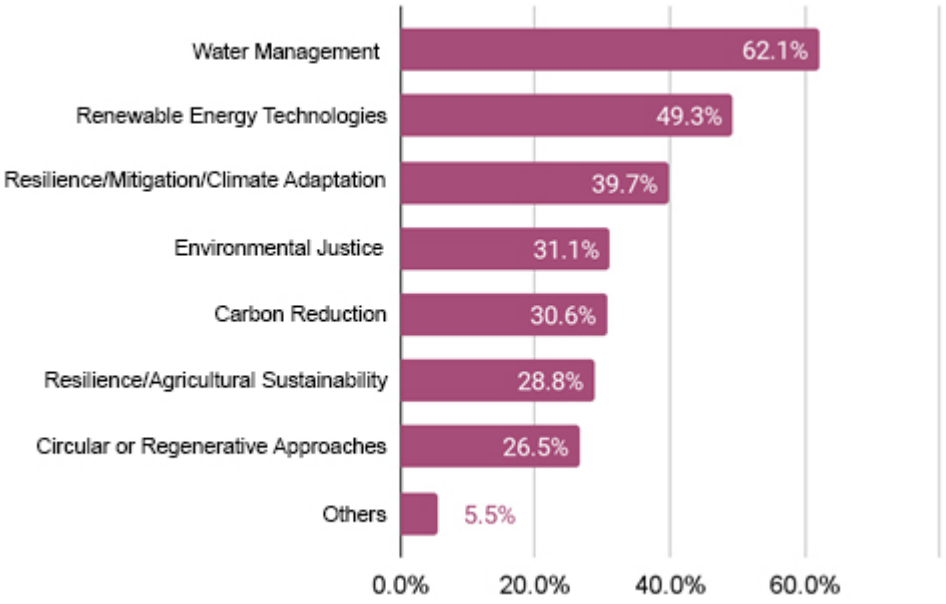
The implication of this result is that there is an area of enormous opportunity for expanded student participation in initiatives related to climate change. Sometimes a guideline or an initial top-down path is required to stimulate student participation. At other times, the commitment comes from indirect

environmental and sustainability initiatives, i.e., waste management and separation and, finally, becomes a comprehensive initiative of climatic action. No significant differences were found in perceptions regarding teacher community participation and engagement in higher education communities in Latin America. **The average is slightly lower for teachers than for students.** It is reasonable to assume that the average commitment to participation is sometimes a student-teacher relationship that is directly correlated and reinforced. In any case, HEIs must implement balanced communication strategies between the aspects of mitigation and adaptation, they must also be able to generate credible long-term commitments with a deeper involvement in the matter. There is still much research to be done regarding the determinants of involvement in long-term climate action (Moser, 2009).

Sometimes the student community does not react in the same way as the teacher community and vice versa. Climate action cuts across the boundaries of the faculty, student community, and administrative staff, on and off campus, and it is therefore crucial to develop effective communication strategies pathways through which students can engage.

Faculty and student participation in climate action initiatives is concentrated on six main themes/issues that dominate the climate action agenda in HEIs in Latin America. The first is water management (62%). There is a close relationship between water management and climate change, in terms of wastewater treatment, for example. There are also significant mitigation opportunities through the installation and management of treatment plants. Sound water management policies, especially those that integrate nature-based solutions, also provide opportunities for adaptation to climate change and offer a huge environmental education opportunity (Inter-American Development Bank, 2018).

Figure 59. Main areas of focus for student or local community involvement.



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

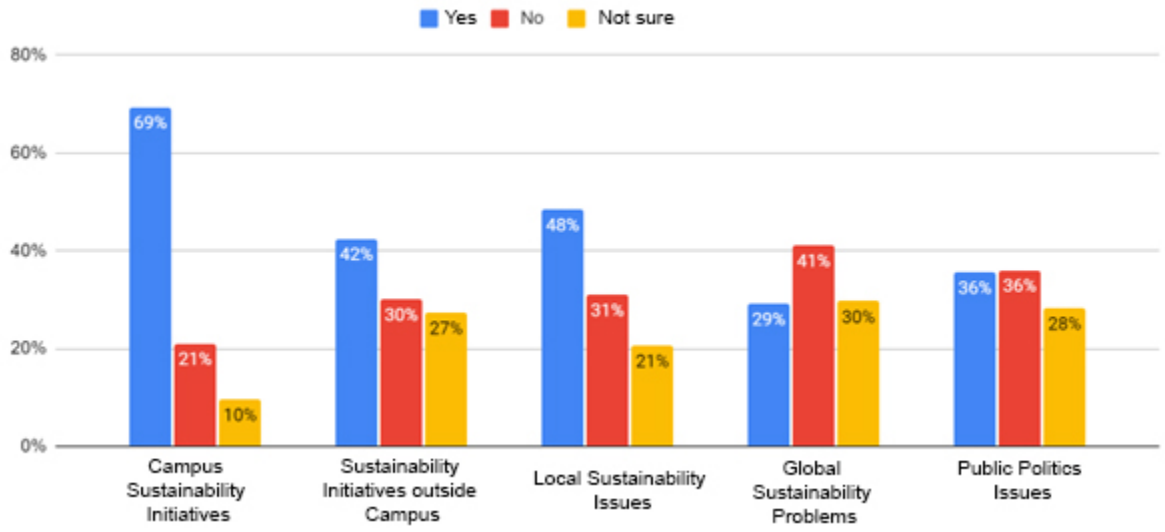
Renewable energy technologies also offer an important set of solutions for climate change mitigation, especially in cases where the technology is developed or has added value or adaptation process that comes from the HEI's own research units. Resilience and adaptation projects also have a significant impact on a fair share of Latin American HEIs. The resilience and adaptation agenda is in line with many campus facility projects, especially those located in coastal ecosystems.

Perhaps one of the most visible issues related to participatory climate action processes has to do with **environmental justice**, which offers a good example of participatory processes for engagement. **Approximately one-third of HEIs in Latin America and the Caribbean have mentioned that their communities are currently active in environmental justice initiatives.** This is especially important for the Latin American context. While it is obviously important that HEIs commit to taking climate action, it is also critical that they consider the impacts of their actions on vulnerable communities.

The majority of HEIs (69%) in Latin America reported that they have carried out campus sustainability initiatives to varying degrees. This finding is not surprising considering the evidence from the literature on green campuses, living laboratories and smart campus initiatives that have prevailed in recent years internationally. **In short, the university campus offers an unparalleled opportunity to develop climate action skills for undergraduate and graduate students, along with faculty and administrative staff, through demonstrative, experimental or potentially replicable projects and grassroots movements at the campus level.**

But on-campus engagement is only the first step toward promoting external multi-stakeholder climate action. In this vein, it is important to note that the survey results indicate that a growing 42% of HEIs are developing *off-campus* climate initiatives.

Figure 60. Percentage of HEIs according to its sustainability initiatives. n=219



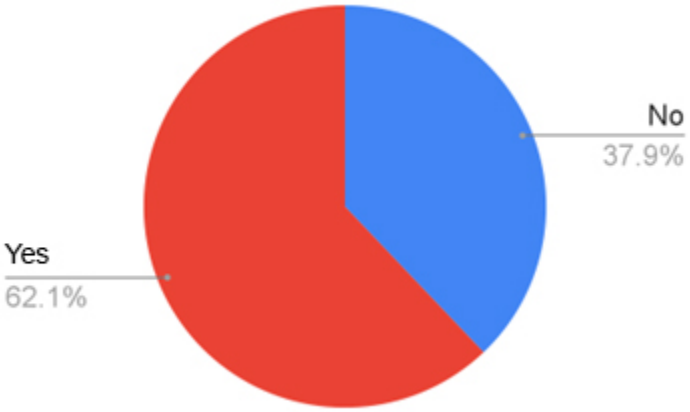
Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

On the other hand, **48% of HEIs are currently addressing local sustainability issues directly or indirectly. Perhaps this is the most promising area of influence for the promotion and commitment to climate action, considering the geographical, population, social and environmental factors of most HEIs in Latin America at the contextual level.** At the same time, 28% of HEIs said they were contributing to global sustainability and environmental policy issues (36%). These trends reflect that the focus for HEI advocacy, participation and engagement for climate action is concentrated at the local level. This approach opens opportunities for the three main areas of climate action: mitigation, adaptation and resilience, as well as the connection with other sustainability issues.

Climate Action Partnerships with HEIs in Latin America

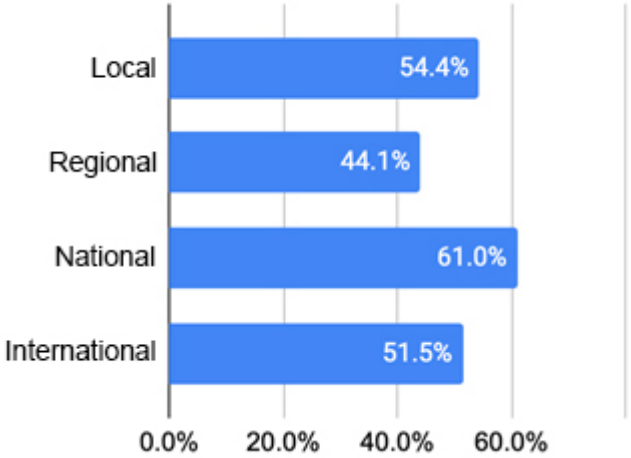
Partnerships for advocacy and participation are crucial to scaling climate action on and off campus. These partnerships can be nurtured at different levels and scales. **According to the results of the survey, 62% of HEIs in Latin America work together with non-governmental organizations on climate action projects.** This indicator is consistent with previous responses showing medium to high levels of student and teacher participation. In general, this result could be interpreted as relatively high, but still with important opportunities for improvement, especially among HEIs that do not yet have partnerships of this type with other sectors.

Figure 61. Percentage of HEIs associated or not with non-governmental organizations related to climate action. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Figure 62. Percentage of HEIs according to the levels at which they are associated with non-governmental organizations for climate action. n=136



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

On the other hand, it is interesting to note that the scale (local, regional, national, international) of the non-governmental organization related to climate action projects is quite homogeneous, but still with some interesting nuances. First, the results of the survey indicate that HEIs more frequently work together for climate action with organizations located at the national level, followed by organizations at the local level.

This trend has at least two possible explanations: One may be the relatively low capacity of local development institutions on climate action issues or the existence of several dominant organizations with national headquarters and presence in different geographical and territorial areas. One interpretation of this action-oriented trend is that there is a convergence in proposing a collaborative agenda for climate action from HEIs in collaboration with non-governmental institutions at different levels.

International non-governmental organizations also play an important role in terms of collaborative efforts with HEIs in Latin America and the Caribbean, which is confirmed by the results of the survey, where approximately one third of the HEIs responded that they have worked or have a project in progress on this scale. The greatest potential for expansion and cross-interconnections between HEIs appears to be at the regional level. Less than 44.1% of respondents are collaborating at that level. However, the line between local and regional collaboration is sometimes difficult to define and therefore the scales may overlap.

CASE STUDY XIII. *A NETWORK FOR CLIMATE ADAPTATION: THE REGIONAL NETWORK ON CLIMATE CHANGE AND DECISION-MAKING- UNESCOS´s UNITWIN PROGRAMME*

The Regional Network on Climate Change and Decision-Making, the UNITWIN Programme, is an initiative coordinated by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the AVINA Foundation, where HEIs and research and training centers in Latin America collaborate. Collaborators include the Latin American Institute of Social Sciences (FLACSO), the Catholic University of Argentina, Getulio Vargas Foundation and University of São Paulo, Brazil, the Pontifical Catholic University of Chile, the Moisés Bertoni Foundation and Universidad Católica Nuestra Señora de la Asunción, Paraguay, the University of the Republic, SARAS Institute and ORT University of Uruguay, and the Inter-American Institute for Global Change Research (UNESCO, 2022).

This network focuses on strengthening "public and private decision-making processes" related to climate change in Latin America (UNITWIN Network on Climate Change and Decision Making, 2021), in the following areas of action:

1. Dialogue and analysis between the disciplines of science, politics, society and economics, and evidence-based decision-making
2. Training of different actors in the political, economic, and social ecosystems, with a focus on innovation, leadership, interdisciplinarity and multi-sectorality in the solution of common challenges
3. Platform for regional action and networks of exchange and collaboration between HEIs and research centers in the field of training and research. (UNITWIN Climate Change and Decision-Making Network, 2021)

The most important actions promoted by the Network highlight the project “Strengthening links between science and governments for the development of climate policies in Latin America” (Latino Adapta), whose purpose is to investigate the knowledge gaps in adaptation to climate change that affect the development and implementation of public policies and strategies in Argentina, Brazil, Chile, Costa Rica, Paraguay and Uruguay, particularly in terms of governance, financing, medicine, and climate, as critical variables for evidence-based decision-making.

The network develops scientific products such as the National Diagnostics on Knowledge Gaps in Adaptation to Climate Change to identify

knowledge gaps in "the implementation of plans and/or actions for adaptation to climate change within the framework of the Nationally Determined Contributions (NDCs) in Argentina, Brazil, Chile, Costa Rica, Paraguay and Uruguay" (UNITWIN Network on Climate Change and Decision Making Network, 2021), as well as the organization of events where expert opinions and key actors of the educational and scientific ecosystem meet, such as the Symposium on Climate Change and Decision Making. This project is coordinated by the Avina Foundation, with the collaboration of UNESCO, and with funding from the International Development Research Centre (IDRC) of Canada.

CASE STUDY XIV. *AN EXAMPLE OF APPROPRIATION, PARTICIPATION AND EXTENSION: THE MEETING OF ENVIRONMENTAL RESPONSABILITIES OF PROVINCES, STATES AND REGIONS IN LATIN AMERICA AND THE CARIBBEAN*

The Forum of Environmental Managers of Provinces, States and Regions of Latin America and the Caribbean is a meeting place between experts and peers that promotes dialogue and the exchange of experiences, effective practices, and the implementation of policies to face the challenges of climate change, particularly through adaptation and mitigation actions in the region (Biosphere, 2022).

From 2014 to date, eight meetings have been held, six face-to-face and two virtual, and 69 initiatives have been presented, where experts from different international organizations, and representatives and those responsible for climate change programs, projects and actions from Latin American and Caribbean provinces, states and regions, have had the opportunity to discuss access to economic and technical cooperation offered by multilateral organizations and organizations around climate change in the region (Biosphere, 2022). This Forum also seeks to promote the exchange of experiences and effective practices, through the socialization of programs, projects and actions against climate change, and their results, from the perspective of those who implement them, to promote peer learning, replicate success stories, create synergies, and strengthen climate action.

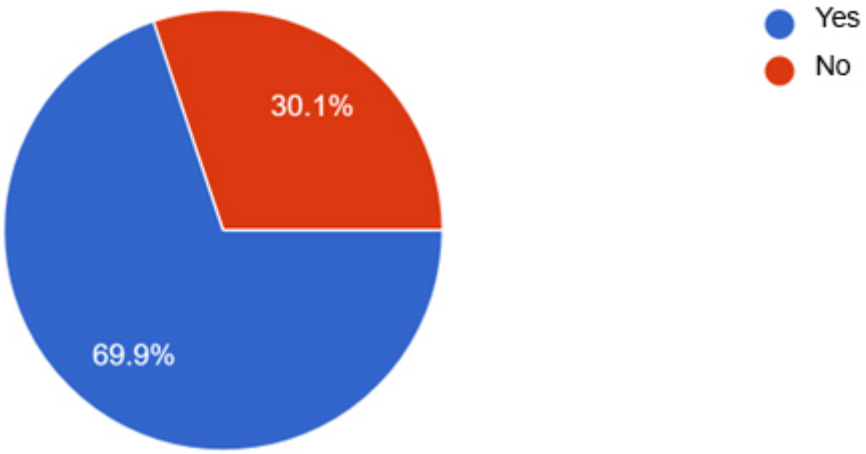
The agenda of topics addressed through the Forum covers, among other topics, corporate environmental management for climate change mitigation; Climate change, sustainable development and food security: action research for climate-resilient, healthy and inclusive food systems; Climate governance challenges; Climate change and health: systemic approaches

and research for development; Climate finance; and Climate Change Education (Biosphere, 2022). Finally, the Forum annually convenes different international actors, namely international cooperation agencies such as the French Development Agency (AFD), development banks such as the Development Bank of Latin America (CAF) and the Inter-American Development Bank (IDB), international economic organizations, the Economic Commission for Latin America and the Caribbean (ECLAC), organizations and programs of the United Nations System such as the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Development Program (UNDP), intergovernmental organizations such as the Intergovernmental Panel on Climate Change (IPCC), foreign missions such as the British Embassy in Argentina and Paraguay, and the Embassy of Canada in Argentina, and international partnerships such as the Global Environment Facility (GEF).

7. International Cooperation and Financing

Governments carry out policy instruments for climate action that involve multi-stakeholder governance processes. On many occasions, HEIs are involved in cooperation with governments and organizations specialized in the design and evaluation of policy instruments such as carbon budgets, greenhouse gas inventories, monitoring, reporting and verification platforms and climate action strategies.

Figure 63. Percentage of HEIs involved with local, regional and/or national governments for climate change action. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Within this context, 70% of higher education institutions have stated through the survey that they have been involved in government initiatives for climate action. This indicator covers a wide spectrum of types of cooperation, ranging from voice and seats on participatory platforms for climate action instruments, to technical assistance and capacity building for climate acceleration instruments.

For many Latin American countries, most climate change policy instruments are directed from the national levels in terms of contributions, laws, enactments, climate actions, determined national programs and plans. **During the processes of building such instruments, HEIs play an important role in data collection, methodological modelling, and causal explanations of climate change problems in specific territorial contexts.**

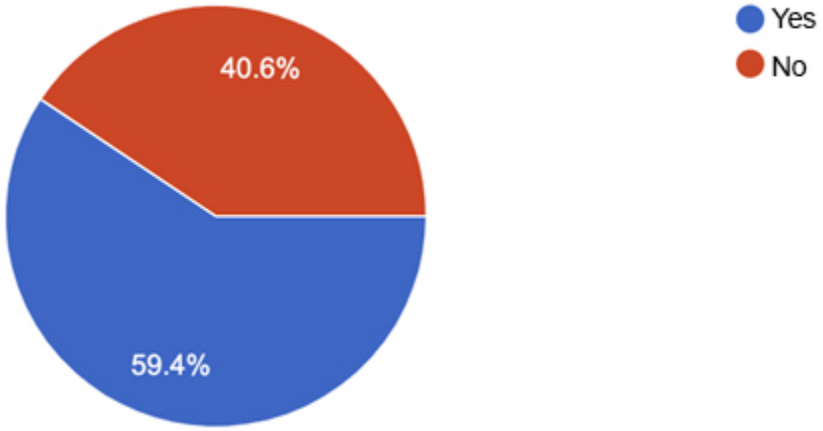
However, HEIs must rapidly accelerate the climate action cooperation processes with state and local governments in the coming years, at least to keep pace and align and increase climate ambition with paces at the national level. Another explanation for the relatively low cooperation at the local level is that there is a capacity building gap between the local and national scales regarding climate change issues in Latin America. But this is an opportunity to create innovative multi-level cooperative schemes (local, regional, national) for cooperation on climate action.

International and regional cooperation is relatively high compared to the national and local levels – especially considering the complexities and challenges, but at the same time the great opportunities involved. Finally, cooperation with states in foreign countries is also a necessary reality in the context of climate action. In fact, **45 of the 219 institutions (20.5%) responded that they have put in place climate action cooperation schemes with neighboring countries**, either as part of an international network or through specific bilateral or project-based initiatives. Cooperation between HEIs and governments is expected to grow in the coming years, as it involves a growing two-way approach with positive feedback to catalyze climate action with long-term scenarios.

Cooperation Between Higher Education Institutions

A second important place for climate action cooperation is between HEIs themselves. Universities and colleges have different academic programs, teaching profiles and specific knowledge that can lead to different degrees of specialization and diversity of cooperation processes for climate action. Therefore, complementary exchange processes emerge that catalyze cooperation for climate action.

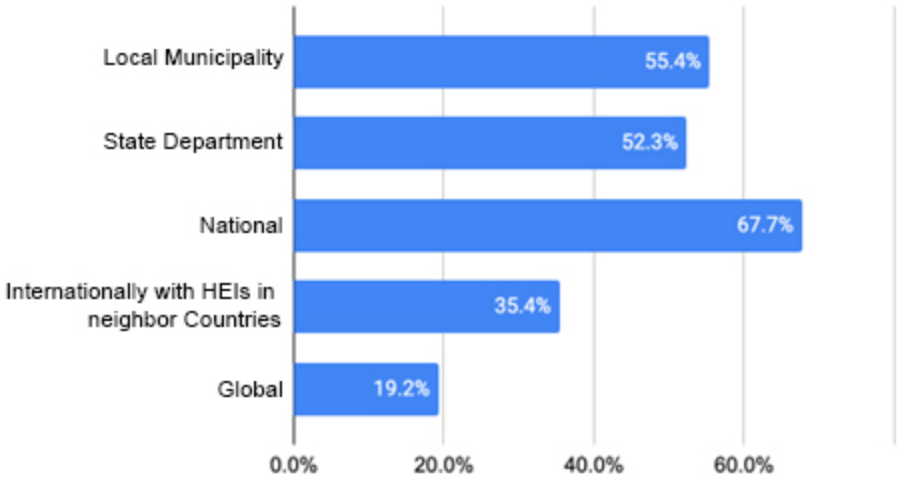
Figure 64. Percentage of HEIs that collaborate with other HEIs to accelerate climate action. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

According to the survey responses, **just under 60% of HEIs have established cooperation processes between peer institutions for climate action.** This trend is lower than that of cooperation with governments (local and national), but greater than that of cooperation with non-governmental organizations.

Figure 65. Percentage of HEIs according to the level of collaboration with other HEIs to accelerate climate action. n=130



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

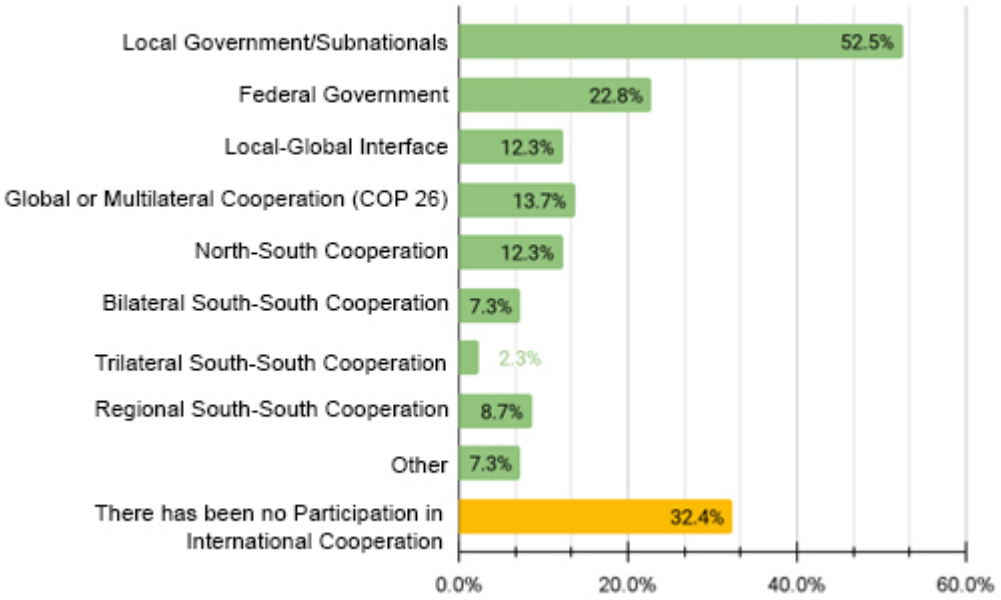
Within this set, the level that shows the greatest cooperation between HEIs for climate action is at the national level. **Nearly two-thirds of HEIs established cooperation schemes or some other type of cooperative work with another national institution.** In the second instance, cooperation between local and state higher education institutions shows cooperation rates of 55% and 52%, respectively. That is, despite being the closest scales for interaction and climate action cooperation between HEIs, they do not represent the most frequent scale of cooperation for climate action.

Cooperation between HEIs in Latin America and the Caribbean is crucial for the acceleration and consolidation of climate action. Flexibility for teacher-student exchange programs, project-based climate-related scenarios and co-creation processes could be potential pathways for accelerating cooperation for climate action.

On the other hand, cooperation between HEIs can take place at various levels, including at the local, regional, and international levels. Obviously, one of the most effective ways to promote cooperation between HEIs in Latin America and the Caribbean is through climate action networks at different scales. As reflected in the dynamics of cooperation in climate action with governments, different types of cooperation in climate action must be defined, examined, and tested to achieve effective and comprehensive cooperation in climate action throughout the Latin American Region.

The survey also asked respondents to indicate which types of international partnerships and/or networks are most commonly used by their HEI for climate action.

Figure 66. Percentages of HEIs according to the international associations or networks they collaborate with for climate action



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

The majority of HEIs in Latin America (52%) have carried out international cooperation processes through local and subnational governments either through multi-stakeholder alliances or local cooperation or through involvement and participation in specific projects. One of the most interesting aspects of cooperation is that South-South cooperation presents different interesting variants: regional, bilateral, and trilateral. Thus, almost 20% of HEIs in Latin America have gone through a kind of south-south cooperation scheme - regional 8.7%, bilateral 7.3% or trilateral 2.3% -. **According to the literature on South-South international cooperation, this is one of the most promising ways to promote and scale up sustainability initiatives, including climate action.**

In general, 32.4% of HEIs have not carried out international cooperation processes for climate action. For these institutions, clearly this might not be the only way to seek cooperation for various structural reasons such as scale, needs and profile, but, more importantly, because their climate action needs could be met by local cooperation or by a specific type of South-South cooperation scheme.

Within the context of international cooperation, the United Nations Development Programme (UNDP) leads the pack of international organizations with the largest penetration among HEIs in Latin America and the Caribbean. The UNDP is a robust and diverse international initiative with a long tradition of engaging in sustainable development issues in Latin America. International agencies and embassies of

countries also play an important role in building alliances with HEIs for climate action: 55% of HEIs have had a cooperation experience - at the project or initiative level - with these entities, including USAID (8.2%) GIZ (14.6%) and the Inter-American Development Bank (IDB) (11.4%).

Figure 67. Percentages of HEIs that have collaborated with international agencies for climate action projects.

Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Some other networks and institutions at the international level in which some of the Latin American HEIs have collaborated are, the UN green push program, the Laudato Sí Movement, and the UN Conference of Parties (COP). With respect to collaboration with these international agencies, the knowledge base provided by HEIs as scientific institutions is crucial not only to address current issues of sustainability and climate action, but also to evaluate which future trends in climate action issues are and will be most crucial to address.

CASTE STUDY. *INSTITUTIONAL PROFILES FOR CLIMATE ACTION: COOPERATION AND LINKAGE FOR CLIMATE ACTION: SCIENTIFIC UNIVERSITY OF THE SOUTH*

The Universidad Científica del Sur is an educational institution established almost 25 years ago in the vicinity of the wildlife refuge known as Los Pantanos de Villa, in Lima, Peru. Since its creation, the vocation of the Scientific University of the South has been to train professionals in different disciplines, with a focus on social, economic, and environmental development (Universidad Científica del Sur, 2022). Due to its geographical location, the university and its community have become guardians of that RAMSAR ecosystem, promoting sustainability as one of its main values. Within the university, the office that is responsible for promoting climate action policies is the Environmental Sustainability Unit, and an Environmental Committee has been formed that has overseen integrating an interdisciplinary vision to the mitigation actions against climate change within the institution. Climate action work, on the other hand, has focused particularly on issues of "energy, bird inventory, plant species, carbon footprint and water footprint" (Flores Roca, 2022).

As part of the postgraduate educational offer, the university offers a master's degree in Climate Change, the only one of its kind in Peru, aimed at professionals from different sectors (public, private, social) and disciplines (anthropology, law, economics, accounting, etc.). As well as the specialization programs in Climate Risk, Mitigation and Adaptation for Sustainable Development, and Environmental Impact Study in Investment Projects (Scientific University of the South, 2022).

In collaboration with the Instituto Tecnológico de Estudios Superiores de Monterrey (Tec de Monterrey), a private Mexican HEI, The Universidad Científica del Sur offers the Master of Business Administration (MBA) which integrates a sustainability approach into its curriculum, with subjects such as triple impact marketing, economics in the era of sustainability, management of sustainable global operations, corporate socio-environmental responsibility, innovation and sustainable entrepreneurship, strategic management of sustainable businesses, and sustainable business planning (Universidad Científica del Sur, 2022).

The research produced at the university is focused on a wide range of topics on the climate agenda, namely: social and human impacts of climate change, climate policy, climate risk management, ecosystem-based

adaptation, greenhouse gas emission inventories, energy efficiency, environmental education for climate change, and renewable energy, chiefly. (Flores Roca, 2022).

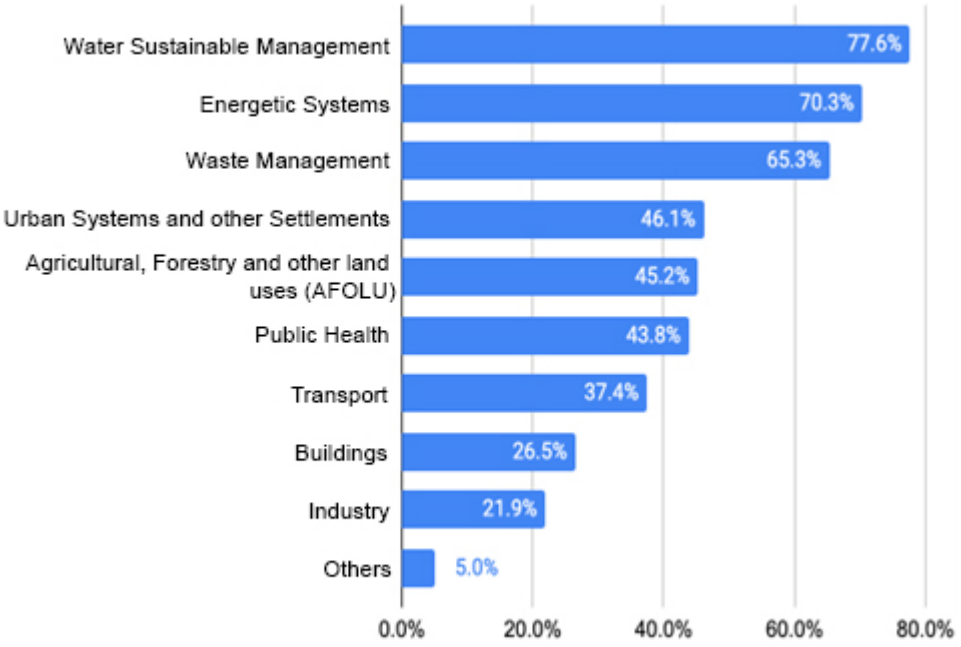
In collaboration with Peru's National Center for Disaster Risk Prevention, the university is developing a climate change risk management program and the university currently works together with public and private sector entities in the elaboration of the first national circular economy standard (Flores Roca, 2022).

The university collaborates with different local, national, and international actors from the public, private, academic, and civil society sectors, including subnational governments, companies, and non-governmental organizations. Examples of this link are the collaborations with the transnational energy company Enel. In addition, the university is part of national and international collaboration networks related to the environmental agenda such as the Interuniversity Environmental Network (RAI) of the Ministry of Environment of Peru, the Association for the Study of Higher Education (ASHE), and The Circular Lab, a laboratory of innovation in circular economy in Spain.

The main challenges facing the university in terms of climate action are related to the lack of interest on the part of the authorities regarding this agenda, the lack of a government policy to promote climate action and, therefore, the lack of university planning and funds to respond to these challenges.

The trends on the topics addressed by HEIs in terms of climate action are very clear: Water management seems to be the first issue at stake, given that almost 80% (77.6%) of HEIs believe that this is the issue where institutions will converge in the coming years for cooperation in the context of climate change. Energy systems (70.3%) and sustainable waste management (65.3%) also play a key role in the issues related to international cooperation undertaken by HEIs, followed by agriculture (45%), public health (44%), urban systems (43%) and transport (37%), respectively.

Figure 68. The thematic areas that present the greatest opportunities for collaboration, according to survey respondents. n=219

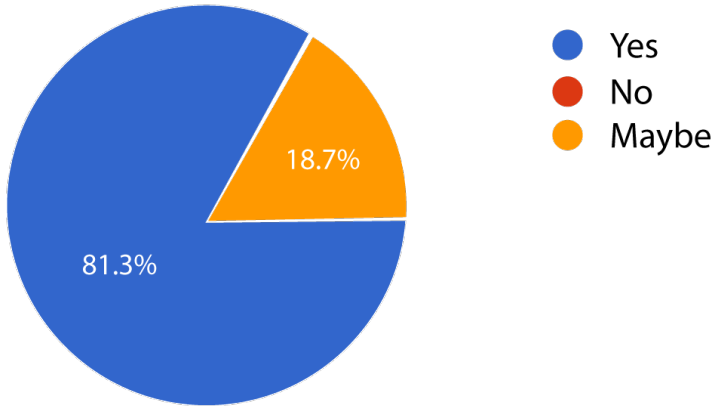


Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

An interesting part of these aspects of cooperation is the intersectionality of some topics that become or derive from frames of reference currently in vogue at the academic and international public policy level. These also arise as very important issues for climate change and are considered pillars of the future according to the perception of the HEIs. Undoubtedly, this set of topics are compatible with the transdisciplinary and cross-cutting research approaches that are currently fashionable on the international sustainable development research agenda, such as ONE Health and Food, Energy and Water (FEW), to mention just a couple.

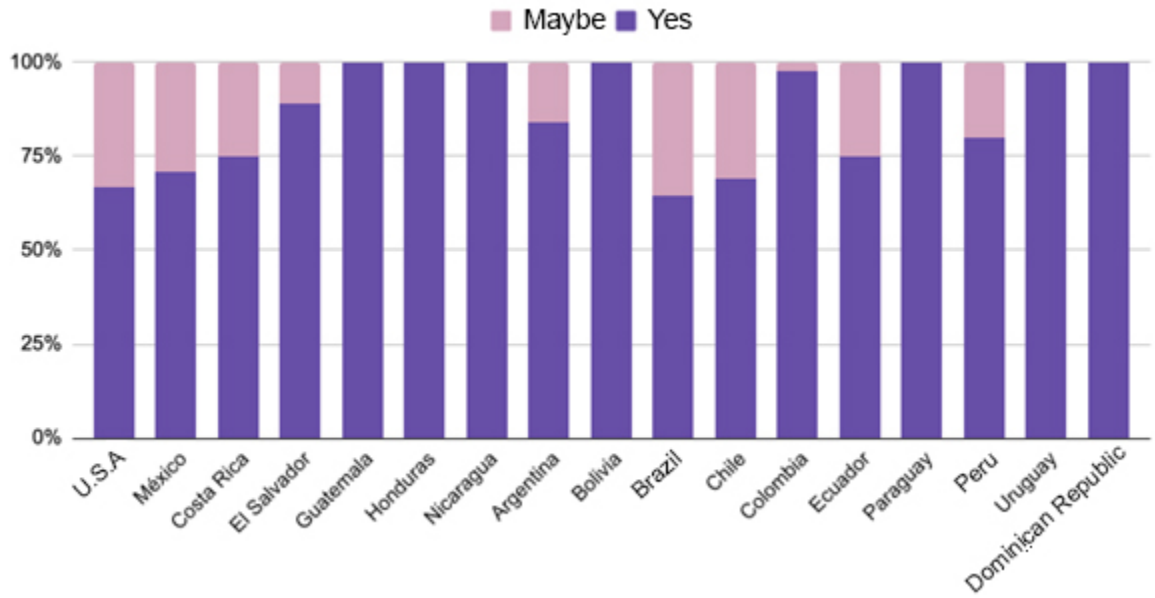
Importantly, **more than 80% of HEIs in Latin America and the Caribbean said they were very interested in joining a network dedicated to implementing climate action programs at the national, regional, and hemispheric levels.**

Figure 69. Percentage of participants who believe their HEI would be interested in joining an institutional network for climate action. n=219



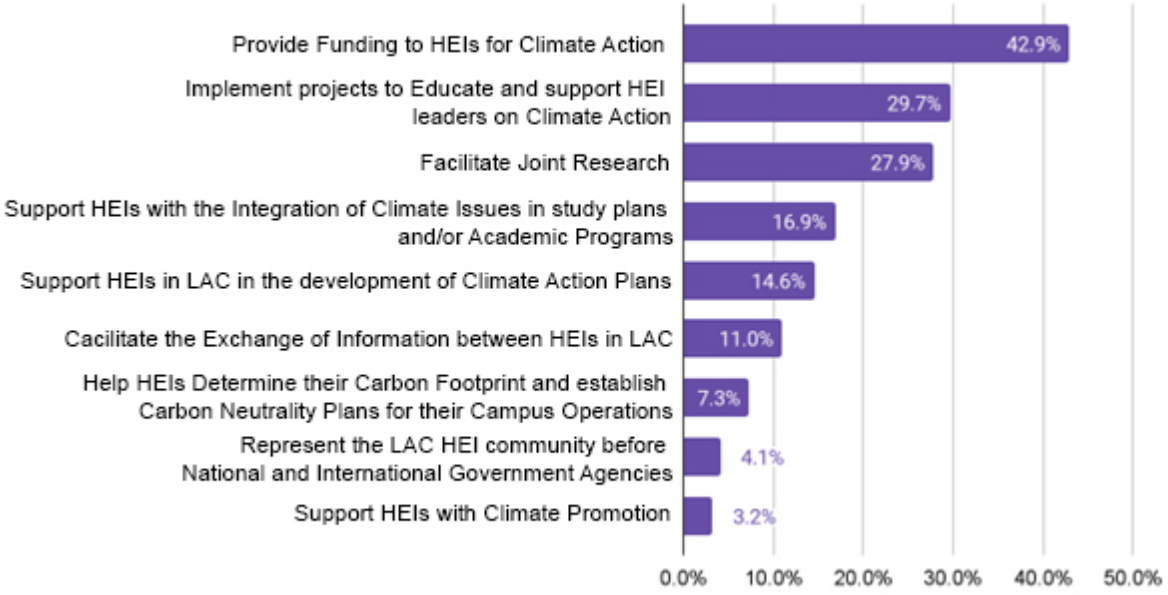
Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Figure 70. Percentage of participants per country who believe their HEI would be interested in joining an institutional network for climate action. n=219



Furthermore, survey results indicate that the most impactful way for a network of LAC HEIs to catalyze climate action at the national, regional, and hemispheric levels is, first and foremost, to offer and develop financing schemes for HEI climate action. This is followed by a) implementing projects to educate and support HEI leaders on climate action and b) facilitating joint research related to climate change issues.

Figure 71. Percentage of HEIs that indicated the most important actions that an HEI network could take to be a catalyst for climate action. n=219



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

CASE STUDY. *INSTITUTIONAL PROFILE FOR CLIMATE ACTION: COOPERATION FOR CLIMATE ADAPTATION AND RESILIENCE AT THE NATIONAL COASTAL UNIVERSITY, ARGENTINA*

The National University of the Litoral integrates in the objectives and strategic lines of its Strategic Institutional Plan, published in 2020, transversality, sustainability and the environmental dimension, and its alignment with the Sustainable Development Goals (SDGs). According to Sánchez and Schneider (2021), members of the Secretariat of Institutional Development and Internationalization of the university, the geographical context of the institution located between important rivers and an urban reserve that crosses the region, place it in a position that favors fieldwork and linkage with local communities. For this reason, about a hundred undergraduate, graduate, doctoral and postdoctoral scientific works are directly related to the reserve. Likewise, the university, in collaboration with an environmental organization, is responsible for the management and conservation of this reserve. In particular, the agenda of research topics in terms of climate action focuses primarily on human and social impacts of climate change, climate policy, climate risk management, ecosystem-based adaptation, social movements, governance and climate change, climate

change education, and energy efficiency, among others. (Sanchez, 2021)

As Highlighted by Sánchez and Schneider (2021), the emphasis on climate action of the university has also been placed on extension projects and linkages with the public and private sector, local governments, and communities for the strengthening of technical capacities, particularly with attention to water problems in the city of Santa Fe, Argentina. Precisely, this context has favored that the Faculty of Engineering and Water Sciences, and the Faculty of Architecture and Urban Planning, have an outstanding role in the proposal of solutions to these problems through adaptation proposals based on nature. When it comes to the participation of local communities in climate action initiatives, these are primarily related to risk management and resilience. An example of this is the construction of a risk map and resilience schemes for the region. Internationally, the city of Santa Fe has been recognized for its resilience schemes, and the university has made important contributions in this regard. (Sánchez and Schneider, 2021; Santa Fe City/100 Resilient Cities, 2017)

Additionally, the UNL promotes different adaptation actions in the face of climate change that include a diagnostic study of energy consumption, and the preparation in process of a responsible energy management plan. These and other actions are mainly concentrated in four areas: energy efficiency, renewable energy, sustainable mobility and sustainable architecture and buildings (Sánchez, 2021).

In 2021, according to the international ranking UI GreenMetric World University Ranking (Green Metric) on green campus policies and sustainability in Higher Education Institutions (HEIs), the Universidad del Littoral ranked first in Argentina and 89th in Latin America (Universities Today, 2021).

CASE STUDY XVII. *COOPERATION AND LINKAGE FOR CLIMATE ACTION: THE CASE OF THE SUSTAINABILITY RESEARCH CENTER, BARNA MANAGEMENT SCHOOL, DOMINICAN REPUBLIC*

The Sustainability Research Center of Barna Management School in the Dominican Republic was born as a support space for the teaching community but evolved into a space offering executive training aimed mainly at current and future, high-level. public and private sector decision makers in the world, with the goal of promoting more inclusive and sustainable organizational and business models and promoting the creation of

collaboration networks between different actors within the country and in the region. This is how this Center "promotes the development of leaders who are able to generate value in a sustainable way in their jobs." (Martí, 2021).

According to Dr. Guillem Martí, Director of the Center, this institution promotes lines or axes of action around sustainability at the level of teaching, research, and community management, particularly within the adoption of sustainable initiatives in the operation of Barna Management School. Mitigation actions against climate change, focused on energy efficiency and sustainable mobility, are promoted through the Center and it inaugurated the first electric vehicle charging point in Santo Domingo. As for the webinars, one was organized on the future of sustainability and climate change in companies, with emphasis on clean mobility, green finance, and green bond issuance, with experts from Colombia, Spain, and the United States (Martí, 2021). According to Martí, the visit to the companies has also been an important source of knowledge, since this allows the identification of common challenges of local business related to sustainability and climate change in the identification of possible solutions to unsolved problems. It should be noted that, both in the case studies and in the visits, the students are asked to imagine different solution scenarios, and participate in a training experience that mimics decision situations that the managers in their organizations would face.

The case study of the sustainable tourism company Grupo Punta Cana, which has been promoted by the Research Center, is a paradigmatic case since its main commitment is to environmental and social sustainability. It also emphasizes an extended link to the local communities, with whom the company worked extensively at its inception, building homes for the towns in the region. The type of construction developed by Grupo Punta Cana incorporate elements of green architecture, innovation, and sustainability. On the other hand, in addition to the method of case studies related to the local and international context, the Center also promotes the development of a risk atlas based on the economic concept of the tragedy of common goods by Garret Hardin, applied to the reality of the Caribbean. This project is led by Dr. Martí, director of the Center. One of the topics included in his work is the regeneration of coral reefs for the protection of species, and its intersectionality with the prevention of natural disasters such as storms, sustainable employability in the region, the involvement of different actors such as universities, and the use of technologies, among others.

Barna Management School belongs to a network of business and senior management schools, with the educational model of IESE Business

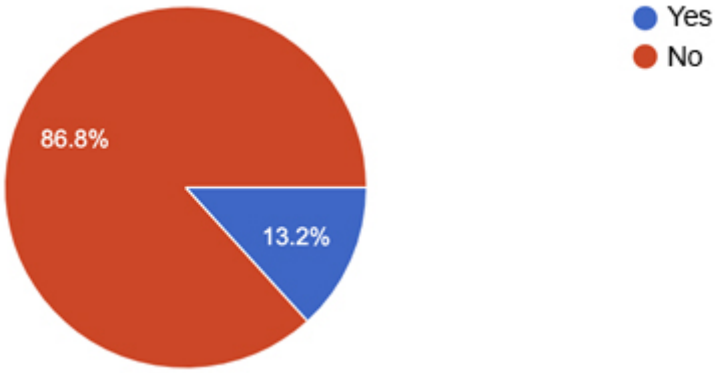
School Barcelona, Spain, both in Central and South America, and in the United States, through which it promotes international teacher mobility in the visiting faculty scheme (Martí, 2021). Likewise, partnerships are promoted with the public and private sectors, and with non-governmental organizations, both local and international, such as the World Bank (WB) and the Inter-American Development Bank (IDB). The climate action strategies promoted by the Center are financed mainly through the institutional budget, and from partnerships and donations from the private sector, therefore, the greatest challenges facing the institution are related to access to other sources of financing, with the direct impact of the work done by the Center on companies, and the lack of visibility of the actions promoted by the institution.

In 2022, the Sustainability Research Center of Barna Management School plans to promote a sustainability survey in companies in the Dominican Republic, with the potential to be replicated in other countries in the region. The objective will be to measure the relevance of company managers to the sustainability agenda. Based on the findings, it is intended to design strategies to make visible those issues with the greatest lag and strengthen those that are driving transformations in companies (Martí, 2021).

International Financing

Only a few higher education institutions in LAC (13%) have received funding from international organizations to support their climate action projects in the last 5 years. Faced with this lack of international resources, HEIs have devised their own ways to advance climate action projects and initiatives using their institutional budget (55%), and resources from local, state, and national governments (32%).

Figure 72. Percentages of HEIs that have received funding for sustainability/climate action projects from international organizations.



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

Figure 73. Frequency of HEIs per country that have received funding for sustainability/climate action projects from international organizations.

	Yes	No	Total
United States	1	5	6
Mexico	6	58	64
North	7 10%	63 90%	70 100%
Costa Rica	1	11	12
El Salvador	1	8	9
Guatemala	2	3	5
Honduras	0	5	5
Nicaragua	0	4	4
Central	4 11%	31 89%	35 100%

Argentina	3	16	19
Bolivia	0	2	2
Brazil	2	15	17
Chile	0	13	13
Colombia	11	30	41
Ecuador	1	3	4
Paraguay	0	3	3
Peru	1	4	5
Uruguay	0	1	1
	18	87	105
South	17%	83%	100%
Dominican Republic		8	8
		8	8
Caribbean	0	100%	100%

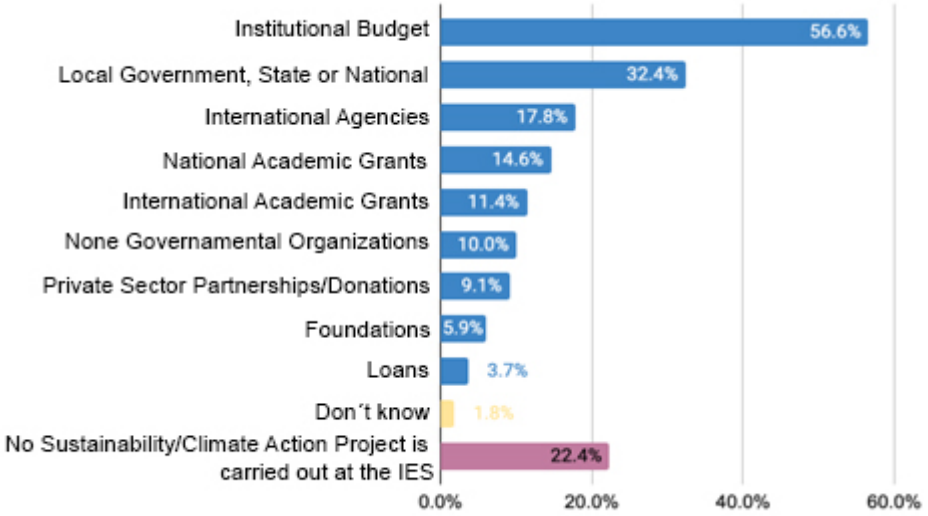
Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

The financial schemes of non-governmental organizations and the private sector are the two areas of opportunity for financing climate action in LAC. According to the survey results, less than 10% of HEIs have collaborated with a non-governmental organization or private sector company in the development of a project related to climate action. Clearly, government agencies – whether as agencies or governments at different scales – have taken the lead in climate action-related projects with HEIs in LAC.

Some HEIs (9%) have begun to attract donations from the private sector or from local, national, and international foundations, but they are still scarce. National and international scholarships (14.6% and 11.4%, respectively) to improve the capacities of students and teachers through programs to invest in climate action projects are still incipient and therefore represent an area of great opportunity to increase investments and budgetary allocations in the years to come.

Bank loans for climate action projects are increasingly used by governments to expand their climate action. Universities can incorporate these financial schemes to decarbonize their campuses in a cost-effective way. At present, however, this instrument is used by a vanishingly small number of HEIs (3.7%). Overall, it seems reasonable to suggest that HEIs in LAC should diversify their climate action portfolio by complementing traditional climate action instruments with other alternatives (loans, grants, bankable projects, grants) to improve the scale and effectiveness of climate action at the campus level.

Figure 74. Frequency of HEIs by sources of financing for sustainability / climate action projects



Source: Survey on Climate Action in Higher Education in Latin America and the Caribbean, 2021

There are several difficulties and challenges in accessing and managing climate action finance. According to the survey respondents, among the most important challenges are financial risk, the lack of professional development for climate action, and a shortage of international calls for financing or grants for climate action, which require a lot of procedural preparation in terms of documents. In the absence of a specific office for these matters, it is difficult for faculty to meet all requirements given time or experience constraints. Lack of experience among staff and faculty hampers the potential to capitalize on climate action financing opportunities.

Gaps for Further Research

While there are undoubtedly many avenues for further research on this topic, we suggest a few specific areas for consideration. First, it would strengthen the results if more institutions, representing a greater level of geographic diversity, were to respond to the survey. Although the group of HEIs in Latin America and the Caribbean that participated was quite large, and certainly was sufficient to carry out descriptive statistical analysis, future exercises would benefit from the inclusion of a greater number of HEIs in countries that participated to a lesser extent in the survey, such as Bolivia, some areas of Brazil, Uruguay, Guatemala, and the Caribbean.

Second, we didn't collect significant amounts of data at the level of GyCEI emissions generated and abated that would allow comparisons to be made at a technical level, in part because many of the HEIs are still undertaking that process. The diversity of methodologies that are being used also presents a challenge in comparing apples to apples. Future research should include collection of emissions data and comparing these metrics at different regional scales.

Third, it would be informative to compare institutional climate action plans to identify trends and effective practices. For example, a comparative study of the diversity of strategies that HEIs are following in their decarbonization routes, and where HEIs are identifying sources of financing, could yield illuminating results that may help other institutions apply effective practices and avoid costly mistakes.

Finally, it is also important to delve more deeply into case studies that address adaptation and climate resilience, as well as explore how intersectionality with other related issues (e.g., human rights, gender equality, poverty, etc) could support the mission of the HEIs while also addressing key climate questions. It is necessary to learn from the practices of indigenous communities and native peoples to strengthen climate action and in the translational research processes that support local knowledge.

8. Conclusion

HEIs can play a unique and significant role in advancing ambitious climate action. As trusted brokers at the nexus of civil society, government, and the private sector, they are well-positioned to serve the interests of all. Perhaps most importantly, HEIs have a **unique role and responsibility** in preparing today's emerging leaders with the knowledge and skills they will need to tackle the climate crisis, whether through science, business, public service, or any other professional path.

Many of the universities and technical/vocational institutions in Latin America and the Caribbean have embraced this challenge head-on and are spearheading ambitious efforts to improve and broaden climate education, strengthen relevant research and innovation, develop solutions in their communities and regions, and inform policy development at all levels.

However, the number of HEIs in the region that have acted boldly to address climate change remains concerningly small and they are faced with significant barriers, both administrative and financial. These obstacles stymie needed reforms and investments, while the few institutions taking aggressive climate action are too often operating in stifling isolation, unable to effectively share their most effective practices with either national or international peers.

It is necessary to develop both incremental and transformational strategies for climate action. Collaboration within and between networks of HEIs in Latin America is very important to leverage knowledge and resources to expand and improve climate action. In this sense, it is very important that higher education networks in Latin America and the Caribbean coordinate and work on shared metrics and strategies for mitigation, adaptation, and resilience for climate action. This can happen through the reduction of GHG emissions under scenarios aiming for net zero emissions by 2030 or 2050, such as the Race to Zero for Universities and Colleges program.

This report and survey results are designed as a first step in deepening our understanding of how HEIs can lead climate action in the LAC region. As we documented, much work is already underway, and much work needs to continue. Our hope is that with increased support and engagement, HEIs and HEI networks within the region can use these findings to inform and accelerate their future climate activity.

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