Critical Vulnerabilities of AI in Latin America

by

Claudia Dobles Camargo

Submitted to the Department of Urban Studies and Planning
in partial fulfillment of the requirements for the degree of
Master of Science in Urban Studies and Planning
at the

Massachusetts Institute of Technology

May 2025

Authored by: Claudia Dobles Camargo
Department of Urban Studies and Planning
May 2nd, 2025

Certified by: Sarah Williams
Associate Professor of Technology and Urban Planning,
Department of Urban Studies and Planning, Thesis supervisor

Accepted by: J. Phillip Thompson
Professor of Political Science and Urban Planning
Department of Urban Studies and Planning, MCP Committee Chair

Critical Vulnerabilities of AI in Latin America

By

Claudia Dobles Camargo

Submitted to the Department of Urban Studies and Planning on May 2nd 2025,
in Partial Fulfillment of the Requirements for the Degree of Master of Science in Urban Studies and Planning

ABSTRACT

Artificial Intelligence (AI) is rapidly reshaping societies, economies, and governance systems worldwide. While it offers tools for addressing critical challenges—such as climate change, health care, and educational inequity—it also risks deepening historical inequalities, undermining democratic institutions, and exacerbating global technological dependencies if not ethically governed. Latin America faces unique vulnerabilities for the development and use of AI, currently underexplored in existing scholarship—such as informal data work or the territorial principle and its implications on AI law enforcement—this study investigates AI's critical vulnerabilities within the Latin American context in order to determine and provide regional and national policies to advance on an inclusive, strategic, and ethical approach for developing and deploying AI systems in Latin America. The study seeks to answer the question through a cross-analysis and comparative case study of six countries (Brazil, Chile, México Costa Rica, El Salvador and Honduras) drawing on existing and recent global and regional benchmarks, including the Stanford HAI AI Index (2024), UNESCO's Recommendation on the Ethics of AI (2021), and the Latin American AI Index (ILIA 2024). The countries were selected based on a broad range of AI readiness levels, focusing on mapping institutional, regulatory, and socio-political contexts as well as metrics and input from relevant sources. The analysis shows structural inequality as the core vulnerability shaping AI's impact in Latin America, alongside governance gaps, limited regional cooperation, and minimal public participation. The analysis identifies ten critical vulnerabilities—including the use of AI in surveillance, increase in inequality, increase in disinformation, AI-use in organized crime, and environmental exploitation—that, if unaddressed, may accelerate democratic erosion and technological dependency. Ethical principles are shown to be deeply interconnected and grounded in human rights, yet their implementation remains aspirational. This research underscores a call for action toward regional coordination, inclusive education strategies prioritizing gender policies and rural areas, and aligned industrial policies in the countries of the region. A Latin American context-specific, collective approach ensures that AI serves the public interest, strengthens sovereignty, and supports equitable development in Latin America.

Keywords: AI governance, Latin America, ethical AI, structural inequality, digital sovereignty, regional cooperation, technological dependency.

Thesis supervisor: Sarah Williams
Title: Associate Professor of Technology and Urban Planning

Acknowledgements

I would like to express my deepest gratitude to those who supported and guided me throughout the development of this thesis.

First and foremost, I am profoundly thankful to my advisor, Sarah Williams, for her guidance, critical insights, and generous mentorship. Her intellectual rigor and encouragement were essential to the completion of this work.

I also extend my sincere thanks to the Economic Commission for Latin America and the Caribbean (ECLAC) for their valuable information, thoughtful feedback, and ongoing support, and to the Organization of American States (OAS) for their institutional collaboration.

This work benefited greatly from the support of the Leventhal Center for Advanced Urbanism, where I found a stimulating environment and access to critical resources.

To my mother, Claudia, who has always been there when needed—thank you. To my husband, Carlos, thank you for your unwavering patience, emotional support, and constant belief in me.

Finally, to my son, Gabriel, who inspires me every single day—I dedicate this work to you, in the hope of helping build a better world for your future.

Biographical note

Claudia Dobles Camargo is an architect (University of Costa Rica) Harvard Loeb Fellow, and former presidential advisor in Costa Rica. She served as the First Lady of Costa Rica from 2018 to 2022, where she co-led the Costa Rican National Decarbonization Plan with the President.

Table of contents

List of tables

List of figures

INTRODUCTION

The present study investigates AI's critical vulnerabilities within the Latin American context. Its objective is to identify and recommend regional and national policies that promote an inclusive, strategic, and ethical approach to the development and deployment of AI systems in Latin America.

To achieve this objective, the study conducts a comparative case analysis of six countries—Brazil, Chile, Mexico, Costa Rica, El Salvador, and Honduras—drawing on recent global and regional benchmarks. These include the Stanford HAI AI Index (2024), UNESCO's *Recommendation on the Ethics of AI* (2021), the Latin American AI Index (ILIA 2024), and other complementary sources. The structure of the study is as follows:

Chapter 1 presents the literature review on the topic. It reveals a landscape in which despite the proliferation of AI ethics frameworks, the vast majority are based on the conditions and contexts of dominant actors in the AI race, with limited participation of women in their development. Regions from the Global South, such as Latin America and Africa, are significantly underrepresented in shaping these frameworks and addressing the realities of developing countries.

There is a marked dominance by economically developed countries—particularly the United States and Europe—while regions like Latin America are notably absent (Jobin, Ienca, & Vayena, 2019). Furthermore, the limited enforcement capacity of these frameworks has been criticized for reducing them to abstract principles without practical implementation or accountability mechanisms, thus enabling "ethics washing" (Hickok, 2020).

Significant gaps include the lack of representation, the absence of context-sensitive frameworks tailored to the realities of regions like Latin America, and the scarcity of mechanisms to translate ethical commitments into real assessments of regional conditions.

Chapter 2 presents and explores the Latin American context in the face of the AI revolution as it plays a marginal role in the global AI ecosystem, with limited research output, minimal patent generation, and scarce representation in leading AI developments. Structural challenges such as low investment in infrastructure, talent migration, technological dependency, and fragmented governance frameworks constrain the region's participation.

Latin America's primary integration into the AI value chain occurs at the pre-development stage through the supply of critical minerals and data labor, positioning it in low-value, extractive roles. While AI deployment across finance, agriculture, and healthcare industries is growing, significant barriers—such as weak digital infrastructure, limited high-performance computing, and systemic inequalities—persist.

The region's emerging native AI initiatives like Latam-GPT signal a nascent shift toward greater autonomy but face the "Valley of Death" financing gap. A systemic, lifecycle-based approach to AI governance rooted in ethical principles and regional collaboration is necessary to move beyond dependency, ensure inclusion, and promote sustainable and rights-centered AI development in Latin America.

The methodology used for the study is presented in **Chapter 3.** This study uses a comprehensive cross-analysis methodology to identify critical vulnerabilities in the AI landscape of Latin America. It combines two methods: Cross-Tabulation and Cross-Impact Analysis (CIA), ensuring a thorough examination, plus Case Studies to provide real-life support for the thesis.

Cross-tabulation was used to systematically assess the relationship between ethical principles formally adopted by selected countries and the enabling conditions necessary for their implementation, using categorical variables and metrics sourced from regulatory frameworks and regional AI indexes.

Cross-Impact Analysis complemented this by examining how breaches or weaknesses in one ethical principle affect others, highlighting the systemic and cascading nature of ethical risks in AI governance.

Grounded in the theoretical basis of cross-analysis from social sciences (J.Corvalán. 2024) the study embraces a systemic perspective rather than isolated, checklist-based reasoning. To further substantiate the analysis, illustrative case studies were incorporated, offering real-world examples of vulnerabilities across Latin America's AI lifecycle.

The methodological process, which was structured in six phases, ensures a thorough examination of the topic: 1.country selection, 2.identification of ethical frameworks, 3.determination of shared principles, 4.regulatory analysis, 5.cross-tabulation and 6.cross-impact assessment, and 7. the integration of case studies. This integrated approach enables a more nuanced and context-sensitive understanding of the ethical, structural, and regulatory challenges faced by Latin America and the governance of AI technologies.

The selection of countries, identified in methodology, is based on the AI readiness classification established by the ILIA 2024 Index, which categorizes Latin American and Caribbean nations into three groups: "Pioneers," "Adopters," and "Explorers," according to their levels of AI development and preparedness. This classification is built from a composite analysis of enabling conditions (infrastructure, data, talent), research and technology adoption, and governance capacities.

Six countries were chosen to ensure a representative cross-section: two with the highest readiness scores to identify best practices (Chile and Brazil), two with mid-range performance to reflect regional standards (Mexico and Costa Rica), and two with the lowest scores to highlight pressing challenges (El Salvador and Honduras). This selection framework enables a balanced and comparative analysis of AI vulnerabilities, strengths, and governance gaps across different levels of regional development.

It also identifies and defines the ethical principles for this study, was based on a systematic review of the international and regional AI governance frameworks formally endorsed by the six selected Latin American countries: Brazil, Chile, Costa Rica, Mexico, El Salvador, and Honduras. Each country has ratified and committed to major frameworks, including UNESCO's Recommendation on the Ethics of AI, the Santiago Declaration, and the Inter-American Framework on Data Governance and AI (MIGDIA).

These agreements converge around a shared vision prioritizing transparency, inclusion, human rights, and responsible AI development. By cross-referencing the principles articulated in these three frameworks, a standardized set of fifteen core ethical principles was established. This set not only serves as a basis for the cross-analysis but also ensures a common understanding among stakeholders, encompassing proportionality, security, fairness, non-discrimination, gender equality, accessibility, sustainability, privacy, data protection, transparency, human rights, accountability, inclusiveness, environmental impact, and multi-stakeholder collaboration.

This common ethical foundation ensures that the evaluation is grounded in the actual normative commitments made by the region's leading AI actors.

Chapter 4 analyses the regulatory frameworks. It reveals that Latin America is advancing unevenly in developing AI governance frameworks. While countries like Brazil, Chile, and Costa Rica are leading with rights-centered and hybrid models that incorporate human rights protections and risk-based oversight, others like Mexico and El Salvador show slower or innovation-driven regulatory engagement, and Honduras currently lacks a national AI framework. The selected countries demonstrate varying depths of ethical commitments and enforcement mechanisms, influenced by global frameworks such as the UNESCO's Recommendation and the EU AI Act. A shift toward hybrid governance approaches is emerging, blending human rights protections with risk classification models. However, regulatory fragmentation, limited territorial enforcement, and dependence on imported AI systems weaken the region's ability to safeguard ethical principles throughout the AI lifecycle fully. Increase regional cooperation, public investment, and strategies to overcome territoriality constraints are essential to ensure inclusive, accountable, and sustainable AI development across Latin America.

In **chapter 5** develops the cross-analysis undertaken to examine the relationship between ethical principles, enabling conditions, and the regional and national contexts of the selected countries. Specifically, a cross-tabulation methodology was employed to systematically contrast the 15 shared ethical principles (Table 10) with the enabling conditions necessary for their effective implementation, drawing on a variety of metrics, policies, and data sources. This approach seeks to determine whether, beyond formal commitments, countries are actively generating the conditions, instruments, and mechanisms required to operationalize and guarantee these ethical principles for their populations.

Furthermore, **chapter 6** presents a cross-impact analysis was conducted to conceptualize AI ethics as a systemic dynamic, emphasizing the interdependence and mutual influence among ethical principles. Five case studies were developed to complement the analysis, provide empirical illustrations of the vulnerabilities observed, and contextualize the region's evolving relationship with AI.

To establish a dialogue between the concepts of the frameworks and the reality in the region, **chapter 7** presents a series of case studies to illustrate how the reality of the deployment of AI in Latin America is impacting the ethical principles and presenting concrete evidence of risks coming to existence.

For example, the unauthorized collection of biometric data, the precarious labor conditions of data workers and micro workers in Latin America who supply essential inputs to AI systems, and the region's exposure to geopolitical tensions between dominant AI powers (notably the United States and China), with particular emphasis on the potential implications for 5G infrastructure deployment.

Chapter 8 synthetizes the conclusion of the cross analyses executed in the previous chapters. It shows that deep-rooted inequality remains the central obstacle to ethical AI governance in Latin America, undermining efforts across education, labor, and rights. Despite formal commitments, vulnerable groups continue to be excluded, and weak institutional capacity hinders the enforcement of ethical principles. Regional collaboration, although crucial, remains mostly rhetorical, and meaningful stakeholder participation is largely absent. Fragmented initiatives highlight the need for systemic, coordinated responses. Disinformation and digital illiteracy further erode trust in AI and democracy. The region's AI landscape is shaped more by structural absences than by active strategies, with ethical principles proving deeply interdependent and anchored in human rights. Sustainability, while referenced, remains a marginal concern compared to other governance priorities.

Based on the conclusions and analysis developed in the previous sections, **chapter 9** identifies ten critical regional vulnerabilities—these range from surveillance mechanisms to the limitations of extraterritorial law enforcement within a context of cross-border digitalization.

Chapter 10 presents a series of recommendations and outlines key policy actions for Latin America to address the challenges and opportunities of AI. Expressing the urgent need for regional cooperation to strengthen negotiating power, harmonize regulations, and tackle cross-border issues like organized crime. An institutional transformation is essential to face current challenges and ensure ethical AI governance to maintain public trust. Education reform must prioritize digital and AI literacy, with targeted efforts in rural areas, gender equality, and teacher training. Industrial policy should align AI development with broader economic resilience and climate action goals.

The chapter calls for increased investment in connectivity, data infrastructure, and inclusive funding mechanisms to build a robust and equitable AI ecosystem. Finally, future research will be necessary. This paper is an initial contribution, not an exhaustive analysis, aiming to spark broader engagement and deeper research in the region.

CHAPTER I

1. LITERATURE REVIEW

Understanding the ethical vulnerabilities Latin America faces in deploying artificial intelligence (AI) requires examining the dominant ethical frameworks guiding global AI governance. Recent literature underscores the growing importance of such frameworks in shaping responsible AI.

Jobin, Ienca, and Vayena (2019) identify over 80 sets of AI ethics guidelines worldwide, noting a broad consensus around principles such as transparency and justice. They highlight that 67% of these guidelines originate from actors based in the United States and Europe, raising concerns about global representativeness (***Jobin, A., Ienca, M., & Vayena, E. (2019).***

On the other hand, Hickok (2020) reinforces these findings but critiques the lack of enforceable mechanisms in most ethical frameworks. She argues that adherence to principles alone is insufficient without corresponding governance and accountability structures (***Hickok, M. (2020).***

Similarly, Mittelstadt (2019) cautions that without binding regulatory instruments, ethical principles risk becoming symbolic or performative, rather than effecting meaningful change

While there is consensus on foundational values, the literature reveals a critical gap in implementation and enforcement strategies—particularly in regions like Latin America. This gap underscores the urgency for contextualized governance models that move beyond declarations of intent to operational frameworks, regulatory mapping, and institutional mechanisms—a need this study seeks to address.

Together, these works highlight the urgent need for ethical frameworks that are globally inclusive, context-sensitive, and enforceable. Ethical commitments must be translated into concrete actions and institutional mechanisms attentive to cultural and regional differences to avoid the imposition of one-size-fits-all models.

This critical reflection on global AI ethics frameworks lays the foundation for an analysis of regional ethical readiness, and in the case of the present research, for the Latin American region.

To bridge the global-local gap, three benchmarks are employed: the ***AI Index 2024*** by Stanford HAI (a global benchmark), the ***ILIA 2024*** (Latin American AI Index, a regional benchmark), and the ***UNESCO Recommendation on the Ethics of AI*** (2021, an international normative benchmark). These sources enable a contextualized analysis of Latin America's positioning within global AI governance and inform the identification of region-specific ethical vulnerabilities.

The ***Artificial Intelligence Index Report 2024***, produced by Stanford University's Institute for Human-Centered Artificial Intelligence (HAI), offers a comprehensive overview of global AI development trends. It synthesizes quantitative and qualitative data to assess technical advancements, public perceptions, investment flows, governance models, and the cross-sectoral impacts of AI in domains such as science, medicine, education, economics, and politics.

Notably, it identifies the rapid expansion of multimodal AI models (e.g., GPT-4, Gemini), a surge in investment in generative AI, and accelerated regulatory efforts in the United States and Europe. At the same time, it highlights growing risks, such as the absence of standardized accountability frameworks, the proliferation of political deepfakes, low developer transparency, and an increase in AI-related incidents.

Latin America remains marginal across key global AI indicators, consistently underrepresented in innovation, governance capacity, and risk management. This peripheral role limits the region's ability to autonomously shape policy and weakens its equitable integration into the digital economy.

By contrast, the ***Índice Latinoamericano de Inteligencia Artificial 2024 (ILIA)***, developed by the Centro Nacional de Inteligencia Artificial (CENIA) in collaboration with the Economic Commission for Latin America and the Caribbean (ECLAC), offers a regional benchmark. It classifies 19 countries into "Pioneers," "Adopters," and "Explorers" based on AI development levels. Although ILIA provides key insights into institutional readiness and policy infrastructure, it does not assess how ethical commitments are operationalized or enforced. This reinforces the gap between normative aspirations and policy implementation across the region.

Addressing this gap requires enforceable frameworks safeguarding human rights and ensuring equitable AI development. These must be tailored to Latin America's diverse infrastructural, institutional, and governance capacities.

The ***UNESCO Recommendation on the Ethics of Artificial Intelligence***—adopted unanimously by all 193 Member States in 2021—provides the most widely endorsed global AI ethics framework. It is grounded in human rights, sustainability, inclusiveness, and international cooperation. It defines foundational values and 11 policy action areas, offering guidelines for monitoring and implementation. While Latin America is not explicitly mentioned, the Recommendation emphasizes the inclusion of low- and middle-income countries (LMICs), least-developed countries (LDCs), landlocked developing countries (LLDCs), and small island developing states (SIDS), which are classifications that include many Latin American countries.

By drawing on global and regional benchmarks, this study offers a grounded perspective on the ethical vulnerabilities Latin America faces in the AI landscape. It aims to identify actionable policy measures and governance strategies that can shift the region from ethical aspiration to institutional implementation, from principle to protection.

For the methodology implemented throughout the study, the pivotal work of Corvalán (2024) on the theoretical basis of cross-analysis from social sciences, provides the study with the systemic perspective and checklist-based reasoning that the research implements while analyzing the three described frameworks, the selected countries and the ethical principles identified. Corvalán, J. (2011). El esquema cruzado como forma de análisis cualitativo en ciencias sociales. ***Cinta de Moebio***, (42), 243–260.

CHAPTER II

2. AI IN THE LATIN AMERICAN CONTEXT

Latin America, one of the world's most culturally and biologically diverse regions, can significantly benefit from artificial intelligence (AI) to support biodiversity protection, monitoring, and management. AI also offers powerful tools to transform and improve the efficiency of the public sector by enhancing decision-making, streamlining administrative processes, strengthening oversight, and combating corruption—structural issues that have long undermined public trust and democratic quality in the region.

There are numerous promises of AI for Latin America. However, realizing its potential depends on the region's readiness to adopt these technologies strategically and equitably. According to the 2024 edition of the Latin American Artificial Intelligence Index (ILIA), levels of preparedness vary widely across countries. While nations like Brazil and Chile have better conditions to capitalize on AI and mitigate its risks, others such as El Salvador and Honduras face serious gaps in infrastructure, talent development, and regulatory frameworks—putting them at risk of falling behind in the global knowledge economy.

This context calls for a thorough and coordinated approach to digital transformation that ensures the region can leverage AI to generate well-being, equity, and meaningful opportunities for its people.

TABLE 1. ILIA (2024) COUNTRY CLASSIFICATION

Country	Score	Category
Chile	73.07	Pioneer
Brazil	69.3	Pioneer
Uruguay	64.98	Pioneer
Argentina	55.77	Adopter
Colombia	52.64	Adopter
México	51.4	Adopter
República Dominicana	46.85	Adopter
Perú	45.52	Adopter
Costa Rica	43.63	Adopter
Panamá	37.48	Explorer
Ecuador	34.59	Explorer
Jamaica	32.38	Explorer
Venezuela	31.52	Explorer
Paraguay	31.05	Explorer
Cuba	27.96	Explorer
Bolivia	26.0	Explorer
Guatemala	25.9	Explorer
El Salvador	25.74	Explorer
Honduras	23.73	Explorer

Source ILIA (2024)

The Latin American Artificial Intelligence Index (ILIA), developed by the Center for Artificial Intelligence (CENIA, Chile) in collaboration with the Economic Commission for Latin America & The Caribbean (ECLAC), is the primary reference for understanding AI vulnerabilities in Latin America. Published in 2023 and updated in 2024. The 2024 edition reveals deep structural gaps: Latin America remains largely absent from global AI research, with only 0.23% of publications in top conferences coming from the region. A severe talent shortage persists, worsened by ongoing brain drain, except in Costa Rica and Uruguay.

Digital literacy levels are low, and public policies are insufficient to close skill gaps. Economically, few countries can scale AI adoption, with startup ecosystems and sovereign AI development virtually absent. There is also a marked gender gap in the AI workforce and a lack of urgent national strategies. Infrastructure challenges are significant, and many countries still lag in 3G, with minimal 5G deployment, which undermines access to emerging technologies. Collaboration patterns are shifting, with growing links to China and India, while links with the U.S. and Europe decline. Despite these challenges, AI is seen as a potential driver of productivity and GDP growth if addressed through targeted investment, policy reform, and educational transformation.

ILIA provides detailed data on AI development across 19 countries, classifying them as "Pioneers," "Adopters," or "Explorers" based on their AI maturity.

Latin America currently plays a marginal role in the global AI ecosystem. Mentions of the region in global reports are limited, as exposed in the latest *Stanford HAI AI Index Report* in its 2024 edition. Research is limited (Latin American Artificial I Index, 2024) , and where data is available, it reveals significant gaps in participation and capacity. Between 2010 and 2022, Latin America and the Caribbean accounted for only 0.21% of all granted AI patents, highlighting the region's minimal contribution to innovation. No Latin American country is listed among the leading developers of major AI models, a space dominated by the United States, China, and Europe.

The report also lacks regional data on critical dimensions such as education, diversity, and governance, further underscoring Latin America's peripheral role. The talent migration chart (p. 234) is one of the few instances where the region is represented: Brazil and Chile show low negative migration rates, Uruguay is also losing talent, and Costa Rica is the only country with a slightly positive net migration. Argentina and Colombia are mentioned in the table of contents but without substantial data or analysis.

These findings are consistent with the region's structural challenges—low investment in infrastructure, dependence on foreign technologies, and limited engagement in global AI research and policy. The ILIA 2024 report gets to similar conclusions, reinforcing that Latin America remains on the margins of AI development and governance. This situation reflects a broader pattern of digital inequality and restricted agency in shaping the future of emerging technologies.

Latin America's integration into the AI value chain is primarily concentrated in the pre-development phases—through data-related tasks such as data collection and annotation (often in the form of microwork), or more broadly, through extracting and supplying critical raw materials.

This insertion is primarily characterized by the provision of low-value inputs or by invisible, informal, and underpaid labor that sustains global AI systems. Much like in other historical moments, Latin America remains positioned in the low-value segments of the global value chain. The region is not integrated in a way that leverages its strengths and resources to generate added value or capitalize on its human talent.

2.1 Pre-Deployment: Critical Minerals & Data

At the Pre-Development stage, Latin America is a key provider of critical minerals and a significant source of training data, both of which are fundamental to the global AI ecosystem. The region holds some of the world's largest reserves of lithium, copper, nickel, cobalt, and rare earth elements, essential for manufacturing semiconductors, batteries, and AI computing hardware. Additionally, Additionally, The ILIA 2024 report includes multiple insights into Latin America's role in data generation for AI expressing how Latin America produces vast amounts of digital, biometric, and environmental data, which fuel AI models, particularly in areas like natural language processing (NLP), facial recognition, and climate prediction.

However, the extraction and utilization of these resources have historically raised several challenges, including concerns over digital sovereignty, environmental sustainability, and data governance, which must be addressed to ensure that AI development is at the service of public interest and within ethical principles.

Critical Minerals

As stated in the article "Lithium: Here is Why Latin America is Key to the Global Energy Transition" (Stefan Ellerbeck, World Economic Forum, January 10, 2023), Latin America plays an strategic role in supplying critical minerals, being Lithium one of the most important, though, not the only one. The development of AI depends on advanced infrastructure, which requires critical minerals for semiconductors, batteries, and computational hardware. Latin America is a key supplier of these resources, including:

- Lithium (Argentina, Bolivia, Chile) – Essential for high-performance batteries in data centers and AI-driven devices.
- Copper (Chile, Peru) – Key for circuit production and wiring in AI servers and chips.
- Nickel and Cobalt (Brazil, Cuba) – Important for battery manufacturing and energy storage.
- Rare Earth Elements (Brazil) – Used in magnets and components essential for advanced computing hardware.

However, this strategic position also raises concerns about historical patterns of extractivism in the region, which have historically resulted in deep inequalities, social unrest, and environmental damage. Those dynamics remain the same today; most lithium-related profits stem from battery manufacturing, which Asia dominates. Latin America risks remaining at the low-value end of the supply chain unless it localizes more of the value chain.

Training Data

Latin America is also a significant source of data for training AI models, particularly in sectors such as:

- Data Work (Microwork): Data annotation, tagging, or content moderation. Earnings are low and irregular.
- Social Media & Digital Platforms: User data in Spanish and Portuguese contributes to training Natural Language Processing (NLP) models.
- Public Records & Census Data: Open government data informs AI applications in urban planning, healthcare, and economic forecasting.
- Surveillance & Facial Recognition: In some countries, biometric data has been extensively collected, as expressed in this paper in the Case Study Argentina, which details the challenges and controversies surrounding biometric data collection in the region, raising privacy concerns. Also, Facial Recognition Technologies are becoming widespread in the region without much regulation (refer to Surveillance & Control) Satellite & Environmental Data: Latin America plays a key role in AI-driven climate monitoring, biodiversity analysis, and precision agriculture.

As mentioned before, the access and exploitation of these resources raise challenges in technological sovereignty, data regulation, and digital extractivism. Paola Ricaurte (*Data Epistemologies, The Coloniality of Power, and Resistance, 2019*) has theorized about "Digital extractivism" in Latin America. Ricaurte connects it to data colonialism and argues that digital technologies enable new exploitation and value accumulation, especially affecting the Global South. Data extraction and commodification dynamics, which refers to the extraction of wealth through data, labor, and infrastructure control without equitable return, is a significant concern in Latin America's AI ecosystem.

Neema Iyer, founder of Policy and fellow at Stanford PACS, in an interview (*Iyer, Neema. Digital Extractivism in Africa Mirrors Colonial Practices. Interview published on August 15 August 15, 2022. Stanford Center on Philanthropy and Civil Society (PACS*) indicates it is a modern form of colonialism enabled by digitization and global capitalism, where wealth is extracted through data, labor, and infrastructure control without equitable return; in her article, Iyer was referring to digital extractivism in Africa, but the commonalities with Latin America are based on both region's colonial legacies. This sparks debates on how these resources should be controlled and used in the global AI ecosystem and throughout the whole AI lifecycle.

2.2 Deployment: Industry leading the way

The growing use of AI in Latin America is characterized by its expanding presence across multiple sectors, supported by rising public and private investment. Governments in the region are trying to leverage AI to address challenges, which will pressure how to strengthen digital infrastructure. Notably, the data center market is set to double by 2029 based on the Latin American News and Analysis (Latinvex) as of 2025, underscoring AI's importance in driving technological capacity and the potential for significant growth in the region.

This investment should be in infrastructure, research and development, talent acquisition, and regulatory frameworks. The potential economic benefits of AI deployment in Latin America are significant, with the region poised to experience substantial growth and development as a result of its increasing integration into the global AI value chain.

- Brazil and Chile Lead Regional AI Deployment: As indicated in Table 1. based on ILIA, these countries appear consistently across multiple sectors (financial services, agriculture, manufacturing, healthcare), signaling they possess the infrastructure, investment capacity, and regulatory frameworks necessary to support and lead in broader AI adoption.
- AI Adoption Is Sector-Specific: Financial Services is the most advanced in AI integration with the widespread use of machine learning for fraud detection, credit scoring, and customer service; the financial sector demonstrates the most mature and diversified AI applications. Fintech ecosystems and digital banking penetration drive this. Moreover, agriculture shows the highest levels of integration, while sectors such as energy remain in the early stages of deployment. Also, Agriculture or AgTech is a strong area for AI in countries like Brazil and Argentina, where productivity and climate resilience are key drivers. AI tools like drones and predictive analytics support high-impact use cases in crop yield, pest control, and resource optimization.
- The Healthcare Sector Shows Moderate but Strategic Growth: Spurred by pandemic-driven digitization and the growth of health tech startups, countries like Mexico, Brazil, and Chile are applying AI in diagnostics, epidemiological forecasting, and digital health triage systems. This strategic growth in the healthcare sector signals a promising future for AI adoption in Latin America, offering hope for improved healthcare services and outcomes.
- Energy and Smart City Initiatives Are in Early Phases: While promising applications exist (e.g., renewable energy forecasting, smart grids, urban mobility planning), these remain in pilot or emerging stages and are limited to countries with targeted innovation initiatives like Chile, Uruguay, and Colombia.

- Retail and Manufacturing Use AI for Efficiency Gains: The NVIDIA State of AI report 2025[1] identified these sectors in Latin America to show medium levels of adoption, focusing on automation, process optimization, and consumer behavior insights. However, their growth depends on platform expansion and digital maturity.
- Public and private sector synergies are key to AI scaling: AI adoption is closely related to enabling conditions such as government policy, regulatory support, and public-private collaborations. These collaborations, which often involve joint research projects, shared data resources, and co-funded initiatives, highlight the need for the existing national AI strategies and the ones to come to incorporate industry and productive sector and invest in enabling infrastructure.

TABLE 2. INDUSTRY-BASED ASSESSMENT OF AI ADOPTION IN LATIN AMERICA

Sector	Adoption Level	Leading Countries	Key Drivers	Key Uses
Financial Services	Very High	Brazil, Mexico, Colombia	Fintech & regulatory support High mobile and digital banking penetration Sustained resources for transition.	• Fraud detection and risk assessment using machine learning • AI-powered customer service (chatbots, virtual assistants) • Credit scoring for underbanked populations • Personalized financial products
Agriculture/ AgTech	High	Brazil, Argentina	Productivity gains, Climate risk	• Precision agriculture (drones, remote sensing, AI-driven analytics) • Yield prediction and soil health analysis • Pest and weather monitoring via AI models
Healthcare	Medium–High	Mexico, Brazil, Chile	Pandemic digitization, Startups	• Medical imaging diagnostics with AI (radiology, dermatology) • Predictive analytics for epidemiology and hospital demand • Virtual health assistants and triage systems
Retail & eCommerce	Medium	Regional	Consumer data, Platform expansion	• Consumer behavior analytics • Automated customer support • Personalized recommendations • Inventory and supply chain optimization
Manufacturing	Medium	Brazil, Mexico	Automation demand, Industrial base	• Predictive maintenance • Quality control via computer vision

[1] https://www.nvidia.com/en-us/lp/industries/state-of-ai-in-retail-and-cpg/

				• Process automation
Energy	Emerging	Mexico, Uruguay, Chile	Renewable transition, Forecasting needs	• AI-based forecasting for renewable energy (wind, solar) • Smart grid optimization • Demand prediction
Smart Cities	Emerging	Chile, Colombia, Brazil	Urban innovation pilots, Data initiatives	• Mobility pattern recognition and transport optimization • Urban planning with satellite and sensor data • Public service demand prediction

Source: ILIA 2024/ NVIDIA State of AI report 2025

2.3 Post-Deployment: Global AI Impacts with Regional Challenges

At the Deployment and Post-Deployment stages, the impact of AI in Latin America will be shaped by its unique socio-economic, political, and technological conditions. Institutional fragility, labor market dynamics, high informality, digital infrastructure gaps, and regulatory asymmetries could make AI deployment risks more pronounced or distinct than other regions.

For instance, automated decision-making systems in public services may reinforce existing inequalities, especially in the welfare state. At the same time, displacement of jobs via automation could exacerbate socio-economic disparities if mitigation strategies are not implemented. Similarly, using AI-driven surveillance technologies in the context of weak data protection frameworks may lead to human rights violations.

TABLE 3. LATIN AMERICA PARTICIPATION IN AI LIFECYCLE

Lifecycle Phase	Latin America's Position	What Latin America Provides or Generates
Problem Definition / Design	Limited involvement	Rarely leads in AI problem framing or design of foundation models. Most AI solutions are imported or adapted, not locally initiated.
Data Collection / Acquisition	Significant role	Large volumes of digital behavioral data from users. Human labor for data annotation, classification, moderation, often via platforms (Appen, Scale AI, etc.).
Model Building / Development	Minimal presence	Virtually no development of frontier models. Some applied research in NLP, ethics, or public-sector AI projects, mostly in Brazil, Chile, Mexico.
Training	Peripheral	Region does not host major compute infrastructure. No hyperscale facilities or model training hubs. Some fine-tuning of models for local applications.
Testing / Evaluation	Moderate participation	Region serves as testbed for AI deployments (e.g., edtech, surveillance, health). Evaluation often occurs without strong regulatory oversight.
Deployment / Implementation	Strong role	Widespread adoption in public services, education, security, finance, often through imported tools. AI deployed without robust safeguards or inclusive governance.
Monitoring / Feedback / Governance	Emerging, fragmented efforts	Some regulatory and ethical initiatives in Brazil, Chile. Weak enforcement mechanisms; little influence on global governance.

Source: OECD AI Policy Observatory

2.4 AI Development in Latin America: Barriers to Advancing

Latin America faces several challenges that make developing strong and independent artificial intelligence (AI) systems hard. Although interest in AI is growing, and there are some positive initiatives, many barriers still prevent the region from building models that can compete on a global scale. A significant issue is the lack of computing power.

The lack of access to high-performance computing or cloud infrastructure is a critical issue that hampers AI development in Latin America. With only Brazil having supercomputers, primarily for industrial use, and Chile's plan to introduce a new supercomputer for academic research, the region is far from meeting the computational demands of cutting-edge AI development. This reliance on international cloud services can be very costly, limiting local experimentation and innovation and underscoring the urgent need for improved computing infrastructure.

AI infrastructure is a crucial component of national development agendas, and its absence can hinder the region's progress in the AI field.

More initiatives like LatamGPT and ILIA are necessary to articulate efforts and to address data scarcity and foster collaboration in the region's AI community.

The shortage of skilled AI professionals in Latin America is a significant challenge that needs to be addressed. The region's struggle to retain its best talent, who often leave for better opportunities in North America or Europe, weakens its AI sector. To foster growth and innovation, the generation of an ecosystem is of the utmost importance. It is also crucial to invest in the development and retention of local AI talent.

TABLE 4. COMPARATIVE OF NUMBER OF HPC LATIN AMERICA AND LEADING COUNTRIES.

UNITED STATES	CHINA	LATIN AMERICA
173	63	7

Based on the latest information available on the TOP500 [2] (November 2024) list of Supercomputers, here is a comparison of HPC Infrastructure between the 2 leading Countries and the Latin American Region.

[2] op500: https://top500.org/lists/top500/2024/11/

TABLE 5. HPC LATIN AMERICA
BASED ON TOP5003 RANKING : 1.8 PFLOP/S—FOR INCLUSION

HPC	Country	Location	Capacity	TOP500 (NOV 2024)
Clementina XXI	Argentina	National Computing Center. National Meteorological Service (SMN) in Buenos Aires	15.7 petaFLOPS of performance. It's designed with Intel Xeon CPU Max Series processors and Intel Data Center GPU Max Series accelerators.	199th
Santos Dumont	Brazil	National Laboratory of Scientific Computation (LNCC) Petrópolis, Rio de Janeiro.	5.1 petaFLOPS. It's utilized for various research projects, including studies related to COVID-19	**89th**
Petrobras 4 HPC Ecosystem	Brazil	Petrobras	4 High performing computers: • Pegasus (2022) • Dragon (2021) • Felix • Atlas • Gaia 678 terabytes of RAM memory and a 400 Gbps network	Pegasus: 70th Dragon: 134th Gaia: 163th Atlas: 226th Fenix: 315th
ABACUS	Mexico	Center for Research and Advanced Studies (CINVESTAV)	~0.5 petaFLOPS of performance	Not within the TOP500. Latest record was 255th in July 2015.
Future HPC in the Region				
2025: National Supercomputing Laboratory5	Chile	National Laboratory for High Performance Computing (NLHPC)	Thirty-nine universities, four research centers and the National University Network (REUNA) signed the agreement in 2023 for the creation of the National Supercomputing Laboratory.	To be expected in 2025

Source: Top500 2024

[3] Top500: https://top500.org/lists/top500/2024/11/
[4] Petrobras News_0ct 2023: https://www.youtube.com/watch?v=tl3z8pN55tA
[5] Centro Nacional de Inteligencia Artificial: https://www.uta.cl/index.php/2022/07/12/mas-de-cuarenta-instituciones-cientificas-y-academicas-se-unen-para-crear-el-laboratorio-nacional-de-supercomputacion/

Valley of Death

The term "Valley of Death" is widely recognized in innovation studies, entrepreneurship, technology transfer, and public policy to describe the critical phase where new technologies or startups face major obstacles transitioning from research and development (R&D) to successful commercial deployment. Although Donald Stokes did not explicitly use this term in *Pasteur's Quadrant* (1997), he addressed the gap between research and application, a concept closely aligned with the idea. The U.S. National Research Council (NRC) frequently employs the term to describe the critical funding and development gap that many startups encounter. William Bonvillian defines it as "the gap between the research phase and successful development and deployment, where promising technologies often die due to lack of investment and institutional support" (*Pioneering Progress: American Science, Technology, and Innovation Policy*, p. 81), emphasizing that while the challenge is universal, it is even more pronounced in the Global South, where financing mechanisms for innovation are severely limited.

In Latin America, funding for AI research remains critically low. Innovation levels across the region are weak, with over 60% of firms exhibiting very limited or no innovation activity. R&D spending relative to GDP in Latin America stands at 0.70%, substantially lower than the United States (2.7%) and the OECD average (2.31%) (Fernandez, Viviana. *The finance of innovation in Latin America*. *International Review of Financial Analysis*, Vol. 53, 2017: 37–47). Financing innovation is primarily a self-driven process, heavily dependent on internal funding due to the absence of robust venture capital markets and limited public support. Structural barriers such as underdeveloped capital markets, restricted technological absorption, and a shortage of qualified human capital further inhibit innovation growth.

Both government and private investments are limited, and the few existing resources are typically concentrated in major cities or elite universities, many of which suffer from infrastructure deficiencies. Consequently, large sectors and institutions are excluded from active participation in AI development efforts.

Although several promising AI initiatives, including a few locally developed models, have emerged in the region, moving beyond pilot projects to full-scale or commercial deployment remains an ongoing challenge. This persistent gap—commonly referred to as the "Valley of Death"—highlights the absence of sustained funding required to support AI projects across all stages of their development.

Unless there is a substantial transformation in R&D investment patterns and human capital development, Latin America will continue to lag behind in global innovation competitiveness.

Native Models in Latin America

The challenge of securing financing and overcoming the "Valley of Death"—as explained—continues to be a significant obstacle to developing locally built artificial intelligence models in Latin America. This barrier limits the region's ability to strengthen its technological sovereignty.

Nevertheless, Latin America has begun to produce native AI models, with *Latam-GPT,* led by Chile and *TeenyTinyLlama* standing out as notable collaborative efforts. These models, along with other initiatives led by the academic sector, are actively working to implement the ethical principles the region has committed to, emphasizing inclusion, non-discrimination, accessibility, and responsiveness to the cultural and social particularities of the Latin American context. As one of the Native Models states in its mission:

> *"It is important for the region to develop the capabilities needed to achieve independence and make informed decisions about how this technology impacts society. So far, we do not have a regional language model, and this task cannot be undertaken by a single group or country alone: it is a challenge that requires the collective effort of the entire region."* (Latam-GPT.org)

TABLE 6. EXAMPLES OF NATIVE MODELS CHARACTERISTICS

Latam-GPT[6]	TeenyTinyLlama
Open-Source Development: designed as an open-source project, allowing developers and researchers across Latin America to access it , study, and adapt the model to regional needs. This openness fosters transparency by enabling scrutiny and collaborative improvement of the AI system. **Collaborative and Inclusive Approach:** The project involves over 30 institutions and more than 60 experts from various Latin American and Caribbean countries. This broad collaboration ensures diverse perspectives are considered, promoting transparency in decision-making processes. **Culturally Relevant Training Data:** LatamGPT is being trained on extensive datasets that include regional dialects, idioms, and cultural references. By incorporating local linguistic and cultural nuances, the model aims to provide more accurate and contextually appropriate responses, enhancing transparency in its outputs. **Ethical Frameworks & Data Governance:** The initiative emphasizes strict ethical standards and data governance practices. It relies on publicly available data, respects copyright laws, and implements data anonymization techniques to protect individual privacy, thereby ensuring transparency in data usage. LatamGPT demonstrates a commitment to Ethical AI principles by promoting openness in development, inclusivity in collaboration, cultural relevance in training data, and ethical responsibility in data governance.	**Open-Source Accessibility**: TeenyTinyLlama is released under the permissive Apache 2.0 license, with its code and models publicly available on platforms like GitHub[7] and Hugging Face[8]. This openness allows researchers and developers to access, inspect, and build upon the work, fostering a collaborative environment. **Detailed Documentation**: The project provides comprehensive documentation, including training procedures, model architecture, and evaluation metrics. This level of detail ensures that users can understand the model's development process and limitations. **Transparency:** The developers explicitly state the model's constraints, such as its primary design for Brazilian-Portuguese and its unsuitability for deployment in real-world applications without further fine-tuning. They also caution about potential biases and inaccuracies, urging users to conduct their own assessments. **Community Engagement**: TeenyTinyLlama invites external contributions, promoting transparency through shared responsibility and collective improvement. TeenyTinyLlama exemplifies transparency & Inclusion in AI development, particularly in the context of low-resource language models.

[6] https://www.latamgpt.org/
[7] https://github.com/
[8] https://huggingface.co/

Reliance on Foreign Technology

While it is true that most AI tools and models used in the region are designed and developed in the U.S., Europe, or China, there's a significant opportunity for Latin America to adapt these tools to local needs. The region can gain more control over how these tools work and potentially promote adaptation of unique applications and solutions that cater to the specific challenges and opportunities in Latin America.

Policy and regulation are limited or lacking. Few countries have strong and transversal national strategies for AI, and laws about how data should be used, how it opens new forms of labor, or how AI should be developed are often unclear or outdated. To address this, potential areas for improvement could include more straightforward guidelines on data privacy and security, creating or updating regulations on AI development and deployment, and the establishment of national AI strategies and sectors that will suffer bigger impacts. These changes could provide a more precise roadmap for promoting regional developers and investors, fostering confidence and progress in the field.

Fragmented Region

The lack of collaboration across countries and institutions is a critical issue that needs to be addressed. The current situation, with too little coordination and duplicated efforts, is slowing down progress and leading to wasted resources. Urgent action is needed to foster a more collaborative environment and seize the opportunities for regional growth.

The inclusion and oversight of local languages and cultures in AI development is a significant issue that needs to be addressed. By training AI systems in Spanish, Portuguese, and Indigenous languages and incorporating cultural references, we can make these systems more valuable and fairer for people in the region. This is a crucial step towards a more inclusive AI.

Finally, small markets and limited demand for AI make it harder to justify significant investments. Many industries in Latin America are slow to adopt AI, so developers have fewer chances to test and improve their models in real-world settings.

All of these challenges add up to a significant obstacle. Without more investment, better policies, and stronger collaboration, Latin America will continue to depend on outside technologies—and have little say in how AI shapes its future.

A Systemic and All-lifecycle Approach to AI is Needed

Unlike many frameworks that focus narrowly on the design or development phases, this approach considers the entire AI lifecycle—from conception and design to deployment, monitoring, and impact evaluation. It emphasizes that ethical AI cannot be achieved through isolated or one-off interventions but requires sustained, systemic attention across all stages.

This framework understands AI as a system: a dynamic, integrated arrangement of technical, institutional, and social components that interact and reinforce one another. AI is not a static tool or standalone application—it is embedded in broader ecosystems. Viewing AI systemically enables a deeper understanding of accountability, transparency, and regulation by highlighting the interdependencies between data, infrastructure, legal frameworks, institutions, and users.

Understanding AI across its lifecycle is essential to evaluate how it is conceived, implemented, and operated and how it affects individuals and societies. A lifecycle approach strengthens social legitimacy by addressing transparency and accountability in each phase, reducing mistrust and resistance to AI adoption. Ethical, social, and technical risks are not confined to a single moment of use—they can emerge during data collection, model training, procurement, or deployment. For instance, an AI system cannot be considered ethical if the data used to train it was labeled under exploitative labor conditions or if its hardware relies on minerals extracted amid social conflict.

Respect for fundamental rights such as privacy, equality, and non-discrimination depends on decisions made across the lifecycle—including sourcing raw materials, many of which come from regions like South America. Limiting responsibility to end users overlooks the roles and decisions of designers, developers, vendors, and procurers, whose actions may disproportionately impact vulnerable communities.

A lifecycle perspective also allows for evaluating whether a technology truly meets social needs, is sustainable, adaptable to local contexts, and distributes its benefits equitably. It shifts the focus from individual actions to a systemic accountability approach.

AI systems evolve, they learn, update, and adapt to new contexts, so evaluation and governance must be continuous. Ongoing mechanisms for monitoring, auditing, and correction are essential, and must be inclusive of perspectives from all regions where AI systems are deployed. Ensuring meaningful participation across these phases is critical.

By viewing AI as a complete system, this approach promotes a more equitable distribution of responsibility across developers, providers, users, regulators, and other stakeholders. It counters the common tendency to blame end users solely and instead fosters clearer, shared accountability—an underdeveloped area in many existing frameworks.

TABLE 7. COMPARATIVE ANALYSIS: RISK-BASED VS. RIGHTS-BASED AI GOVERNANCE

<table>
<tr><td colspan="3">Risk-Based models prioritize the severity and likelihood of harms and has a sectorial focus, Rights-Based models prioritize the intrinsic value of rights and apply proportionality to any interference, regardless of risk level or sector.</td></tr>
<tr><th>Aspect</th><th>Risk-Based</th><th>Rights-Based</th></tr>
<tr><td>Coceptual Basis</td><td>Focuses on managing and mitigating harms based on likelihood and severity of risk.</td><td>Based on international human rights law, emphasizing the protection and promotion of fundamental rights</td></tr>
<tr><td>Main Objective</td><td>Minimize risks to safety, health, and public interest while enabling innovation.</td><td>Ensure that AI does not infringe on individual and collective rights and that governance fosters equity and justice.</td></tr>
<tr><td>Regulatory Approach</td><td>Rationale: Classify AI systems by level of risk (e.g., high, low, unacceptable) and impose proportionate obligations.

Focus: System-focused: classification and regulation vary by use-case.

Tools: Risk assessments, technical standards, transparency, conformity checks.

Application of Regulation: Sectoral.
Tailored to specific contexts (e.g., healthcare, law enforcement).

Institutional Implications:
Expert-driven
Risk mitigation plans, audits, compliance checklists.
Often include obligations for justification, documentation, and redress mechanisms when rights may be affected</td><td>Rationale: Apply a universal standard of rights protection to all AI systems, regardless of risk classification.

Focus: People-focused: universal safeguards regardless of sector or use-case.

Tools: Human Rights Impact Assessments (HRIAs) or Algorithmic Impact Assessments (AIAs) to identify and weigh potential rights harms.

Application of Regulation:
Cross-sectoral.
emphasis on structural inequalities

Institutional Implications:
Multi-stakeholder, public feedback.
Grievance mechanisms, legal redress, participatory oversight.</td></tr>
<tr><td>Obligations</td><td>Varying requirements depending on risk level.</td><td>Consistent obligations aligned with rights protection.</td></tr>
</table>

Strengths & Weaknesses of each Approach		
	Risk-Based	Rights-Based
Strengths	- Flexible, adaptable to technological evolution. - Allows proportional regulation.	- Strong normative foundation. - Prioritizes equity and dignity.
Weaknesses	- May overlook systemic rights violations in "low-risk" systems. - Lacks consistent methodology.	- Can be seen less flexible. - Implementation may face political resistance or legal complexity.

CHAPTER III

3. METHODOLOGY

To identify critical vulnerabilities, two cross-analysis methods were employed. Cross-tabulation: a method used to examine the relationship between two or more categorical variables by displaying the data in a matrix format (a table). Cross-impact analysis (CIA) a method used to examine how different events, risks, or variables influence each other, especially in complex or uncertain environments.

Additionally, to delve deeper into certain vulnerabilities within real-world scenarios in Latin America and to support the arguments presented in the cross-analysis, case studies were used as illustrative examples and complementary evidence.

3.1 CROSS-ANALYSIS METHODS

Drawing from Javier Corvalán's article "*The Crossed Diagram as a Form of Qualitative Analysis in Social Sciences*" (2011), the crossed diagram, from which the cross-analysis is derived, has its origins in the Cartesian coordinate system, specifically within analytic geometry, emphasizing the use of oppositions, spatial representation, and conceptual generation. In the social sciences, it was later adopted through the influence of structural linguistics and structural anthropology to formalize qualitative analysis using binary oppositions and systemic thinking. Its core analytical elements include the logic of opposites, spatialization—where the position within a conceptual field matters—and conceptual fecundity, where crossing opposites generates new concepts or fields.

Cross-analysis methods, more broadly, refer to techniques that compare, contrast, and integrate information across multiple sources, datasets, or frameworks to reveal main insights. They aim to uncover patterns, inconsistencies, overlaps, synergies, or hidden vulnerabilities by systematically examining how different elements interact across cases or domains. These methods are particularly valuable in exploring relational and systemic dimensions that may not be visible through isolated analysis.

The MIT AI Policy Brief (2023) by Huttenlocher, D., Ozdaglar, A., & Goldston, D. "*A Framework for U.S. AI Governance: Creating a Safe and Thriving AI Sector*" reflects the necessity of such approach by emphasizing the need to assess AI systems holistically, noting that AI components interact in unexpected ways, making integrated auditing essential to identifying vulnerabilities and performance gaps, even though the brief does not explicitly label this approach as "cross-analysis."

Cross-analysis supports diverse fields by offering a structured pathway to manage complexity. Scholars such as Alain Touraine, George Ritzer, José Joaquín Brunner, François Dubet, and Pierre Bourdieu have applied the method differently, some focusing solely on oppositions, others incorporating spatial analysis or conceptual generativity. Structural analysis, particularly the work of Lévi-Strauss, Barthes, and Greimas, heavily influenced its contemporary sociological applications. Methodologically, the cross-analysis promotes formalization and standardization.

In qualitative research, it formalizes data by structuring oppositions, relationships, and emergent patterns, particularly benefiting disciplines like sociology, anthropology, education studies, and political science. It plays a critical role in identifying vulnerabilities and risks, especially in AI deployment, cybersecurity, and public health infrastructures, by systematically comparing technical, social, and ethical layers. In the governance of emerging technologies, cross-analysis aids in navigating ethical trade-offs and regulatory gaps across stakeholders, sectors, and contexts.

It helps systemic analysis by deepening the understanding of social fields and cultural structures, supporting research into inequality and power dynamics. In policymaking, it enables cross-referencing diverse policies and outcomes, detecting contradictions and improving coherence and effectiveness. It also contributes to the development of comparative frameworks and standards in AI, climate, education, and labor regulation by clarifying overlaps and divergences between governance levels. In organizational studies, cross-analysis reveals alignments and fractures within internal processes and cultural dynamics, informing better strategic decision-making. Also, for scenario and adaptive planning, it facilitates mapping possible futures by comparing trends and variables across disciplines, enhancing resilience strategies. In empirical research, it strengthens data triangulation and validation by integrating qualitative and quantitative findings into a more coherent understanding.

The method has been applied in social research to study factors influencing public opinion or behavior adoption, in health research to explore relationships between risk factors and diseases, and in education to analyze the impact of teaching strategies on academic performance. Its use requires careful case selection, a clear definition of conditions and outcomes, and critical interpretation to account for biases and study limitations.

For this paper, cross-analysis proves particularly useful in uncovering intersectional trends, such as how gender and income interact in access to AI, or analyzing policy trade-offs within complex, interdependent systems. Since AI operates within systemic contexts, ethical impacts must be assessed in a systemic way: ethical principles do not function independently, and a breach in one area often cascades into others. The ethical principles analyzed—drawn from the region's main frameworks—overlap and influence each other, creating an interconnected network rather than isolated checklists.

The analysis conducted follows a systemic approach, aligned with the ethical principles adopted by the countries in the sample. Although metrics and indicators were evaluated individually, conclusions were drawn from a network perspective to avoid fragmented or checklist-based reasoning.

The cross-analysis was performed in two phases:

1. **The Cross-Tabulation phase:** the study analyzed each ethical principle against enabling conditions using categorical variables and metrics from existing regulatory frameworks; for instance, gender equality was compared with access to digital education to uncover structural disparities.
2. **The Cross-Impact Analysis (CIA) phase:** the study assessed how ethical principles influence one another through a matrix approach, identifying interdependencies and tensions. For example, a violation of data protection cannot be isolated from breaches in privacy and security, highlighting the cascading nature of ethical risks. Together, these methods support more informed, adaptive, and context-sensitive policymaking capable of addressing the complexities of ethical AI governance.

3.2 Cross-Analysis: Methodological Steps

Given the absence of existing frameworks or risk assessments that focus specifically on the AI lifecycle in Latin America, this framework aims to fill that gap by providing a detailed analysis of the Latin American context and nuances. Its primary objective is to identify critical vulnerabilities and structural risks from a lifecycle perspective, thereby complementing the extensive body of literature that has predominantly focused on the development phase of AI systems.

To identify potential vulnerabilities in the region, the framework adopts a cross-analysis methodology that contrasts the ethical principles the selected countries have committed to with the actual enabling conditions required to uphold those commitments. This approach allows one to assess whether ethical AI principles are being translated into practice or remain aspirational.

The methodological steps are as follows:

1. **Country Selection**: A representative sample of six Latin American countries, carefully chosen for their diversity and relevance to the AI landscape, will be defined for the analysis. **Identification of Ethical Frameworks**: The ethical AI frameworks formally adopted or endorsed by the selected countries will be identified, emphasizing shared commitments that can serve as a standard analytical base.
2. **Determination of Shared Ethical Principles**: A set of shared ethical principles will guide the analysis based on the common frameworks—particularly the UNESCO Recommendation on the Ethics of AI. These principles were selected based on their prominence in the identified ethical frameworks and their relevance to the AI context in Latin America.
3. **Analysis of the regulatory frameworks** of each selected country will provide the legal foundation for assessing specific metrics and safeguards necessary to ensure an ethical AI lifecycle. This review will also consider the countries' capacity to enforce these legal frameworks effectively.
4. **Cross-tabulation analysis of Principles and Enabling Conditions**: Each ethical principle, including the enabling conditions required for its implementation, will be assessed. This analysis will be supported by metrics and indicators from various sources, including the 2024 edition of the Latin American Artificial Intelligence Index (ILIA).
5. **Cross-Impact Analysis (CIA)** This framework seeks to offer a more grounded and context-sensitive understanding of AI vulnerabilities in Latin America by grounding the analysis in ethical commitments made by the six (6) selected countries and the implementation conditions, thereby providing practical insights for policymakers, researchers, and stakeholders in the region.
6. **Case Studies:** To delve deeper into certain vulnerabilities within real-world scenarios in Latin America and to support the arguments presented in the cross-analysis, case studies were used as illustrative examples and complementary evidence.

3.3 Country Selection

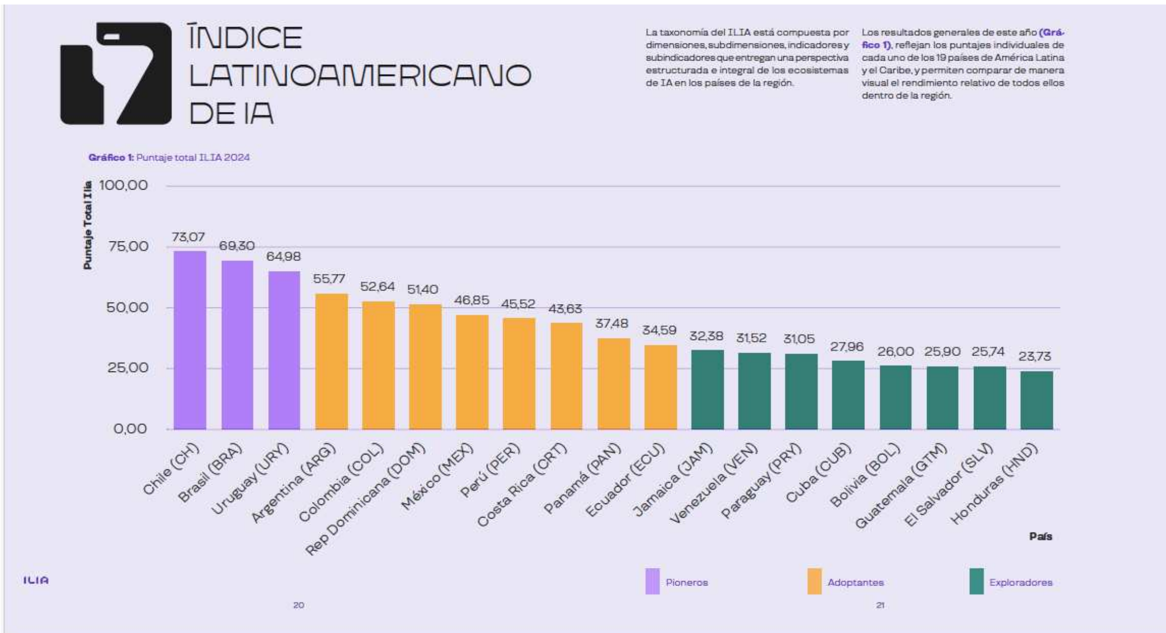
The country selection for this framework is of utmost importance, as it is based on the classification of AI readiness established by ILIA 2024. ILIA categorize countries into three groups—*"Pioneers," "Adopters," and "Explorers"*—according to their level of development and preparedness regarding artificial intelligence. This classification serves as the foundation for identifying the six reference countries included in this paper, and it is an important step in our collective understanding of AI readiness.

The grouping is determined through a composite analysis of multiple indicators, organized into three main dimensions:

1. **Enabling Conditions:** Infrastructure, data availability, and human talent.
2. **R&D and Technology Adoption:** AI research, innovation, and adoption by both public and private sectors.
3. **Governance:** National vision, institutional capacity, international cooperation, and public engagement.

Based on these metrics, ILIA assesses 19 countries across Latin America and the Caribbean.

FIGURE 1. TOTAL SCORE ILIA (2024) INDEX



Source: ILIA 2024-ECLAC

For this study, six countries were selected to reflect a representative cross-section of the region:

- **Two countries with the highest readiness levels** to identify best practices, lessons learned, and potential synergies.
- **Two countries with mid-range performance** represent the regional standard.
- **Two countries with the lowest readiness levels** highlight the most pressing challenges and gaps.

TABLE 8. COUNTRY SELECTION

Pioneers	Adopters	Explorers
Chile	Mexico	El Salvador
Brazil	Costa Rica	Honduras

Based on the information from ILIA 2024 and the previously mentioned selection criteria, the two countries with the best indices, two intermediate countries representing the regional standard, and the two countries with the lowest indices and most significant challenges were chosen. This selection process is a key part of our study, and we look forward to sharing the results with you.

3.4 Reference Ethical AI Governance Frameworks

Ethics in AI has been a long-going concern. International organizations, multilateral institutions, and governments have developed ethical AI frameworks. These frameworks and agreements take different approaches, broadly categorized into three main areas: Human Rights-Centered, Risk

Mangement-Centered, Government-Centered and Hybrid. Some of the most importnat frameworks could be classified as:

Human Rights-Centered Frameworks

Emphasize fundamental rights, fairness, non-discrimination, and human well-being in AI development and deployment. Some examples of this approach are:

- **UNESCO Recommendation on the Ethics of AI (2021):** – Prioritizes human rights, cultural diversity, sustainability, and ethical AI governance.
- **The Santiago Declaration (2023**): is rights-focused and calls for public oversight, transparency, inclusion, and prevention of AI-enabled rights violations.
- **MIGDIA: Inter-American Model Law (2022)**: Strong rights-oriented framing on data protection and transparency; includes AI implications tied to data handling and algorithmic fairness.
- **OECD AI Principles (2019):** This principle combines human-centric values with innovation and economic growth and encourages risk management and accountability mechanisms.
- References to both risk management and human rights.
- **Montreal Declaration for Responsible AI (2018)**: Focuses on AI development that respects democracy, fundamental rights, and environmental concerns.
- **White House AI Bill of Rights (2022)**: Advocates for protection against algorithmic discrimination, privacy violations, and lack of transparency.
- **Asilomar AI Principles (2017)**: Encourages ethical considerations in AI research to ensure long-term human well-being.

Risk Management-Centered Frameworks

These frameworks prioritize identifying, assessing, and mitigating risks associated with AI systems, including robustness, security, and bias detection. Some examples of this approach are:

- **United States_NIST AI Risk Management Framework (2023)**: Provides actionable guidelines for organizations to evaluate and mitigate AI risks.
- **IEEE Ethically Aligned Design (EAD) (2016, updated 2019)** – Focuses on AI safety, human well-being, and harm prevention through responsible design.
- **OECD AI Principles (2019)**. – Calls for robust, transparent, and accountable AI systems while ensuring responsible innovation.

Governance-Centered Frameworks

These focus on policy coordination, regulatory oversight, and international cooperation in AI governance. Some examples of this approach are:

- **EU Ethics Guidelines for Trustworthy AI (2019)**: Advocates for strong AI governance through human oversight, accountability, and legal compliance.
- **GPAI (Global Partnership on AI) (2020)**: Promotes international collaboration on AI policy, research, and governance mechanisms.
- **Beijing AI Principles (2019)**: Aims to guide AI governance in China, emphasizing responsible and controllable innovation.

Hybrid & Other Frameworks

- **OECD AI Principles (2019):** Combines human-centric values with innovation and economic growth; encourages risk management and accountability mechanisms—references both risk management and human rights.
- **El Salvador Promotion Framework (2025):** It aims to incentivize AI adoption and position the country as an innovation hub, but there is limited discussion of ethical or human rights safeguards.

One common theme across the frameworks is the general concern regarding bias and discrimination. They all also advocate for transparency and accountability, even though more and more scholarly work suggests AI systems are getting more complex. Another common pitfall of most Ethical Frameworks is the lack of focus on enforcement mechanisms. Enforcement is one weakness of most public policies since it is difficult and requires resources that are sometimes lacking in most Latin American countries.

For Latin America, most AI-Governance are whether rights-centered or risk-centered.

3.5 Identification of Ethical Frameworks

Latin American countries are committed to ethical AI. Proof of this is the number of initiatives and ethical frameworks that have been signed and adopted by Latin American Countries, with Brazil, Chile, Costa Rica, Mexico, El Salvador, and Honduras endorsing international agreements like the UNESCO Recommendation and the Santiago Declaration. Brazil and Chile stand out for their active roles in global initiatives, participating in alliances and partnerships beyond the region.

There is growing cooperation across the region through frameworks like the one led by the Organization of American States, which helps countries align on data and AI policies. Costa Rica also plays a more visible role in international digital governance as it prepares to lead the OECD Ministerial Council. Most agreements emphasize transparency, inclusion, and cooperation, showing that countries share a common vision for responsible AI.

However, not all countries are equally involved; while some participate in a wide range of initiatives (Brazil, Chile), others have more limited engagement (Honduras). Signing agreements is an important first step, but the real challenge is ensuring these commitments lead to real policies and action. Latin America is navigating global AI governance tilted towards a Rights-center or Risk-centerd apporach as discussed earlier and by building ties both with traditional international organizations and with emerging alliances, reflecting a flexible and strategic approach.

TABLE 9. AI INITIATIVES, AGREEMENTS AND FRAMEWORKS ADOPTED BY THE SELECTED COUNTRIES

Country	Participation
Brazil	Global Partnership on Artificial Intelligence (GPAI): Brazil is a member of GPAI, an international initiative launched in June 2020 to guide the responsible development and use of AI, ensuring it aligns with human rights and democratic values. AI Action Summit Declaration: In February 2025, Brazil signed the "Statement on Inclusive and Sustainable Artificial Intelligence for People and the Planet" during the AI Action Summit. This declaration emphasizes principles such as accessibility, transparency, and international cooperation in AI development. BRICS AI Alliance: In December 2024, Brazil joined an AI alliance with BRICS countries (Brazil, Russia, India, China, and South Africa) and other interested states. This collaboration aims to challenge the dominance of the United States in AI technology by facilitating joint research, AI regulation, and market opportunities for AI products among member countries. UNESCO's Recommendation on the Ethics of Artificial Intelligence Inter-American Framework on Data Governance and Artificial Intelligence (MIGDIA): An initiative by the Organization of American States (OAS) to guide member states in developing data governance for AI. Brazil participated in its development. Santiago Declaration to Promote Ethical AI
Chile	Global Partnership on Artificial Intelligence (GPAI): Chile has been invited to join GPAI, an international initiative established to guide the responsible development and use of AI in a manner that respects human rights and democratic values. Digital Economy Partnership Agreement (DEPA): Chile is a founding member of DEPA, a trade agreement with New Zealand and Singapore that facilitates digital trade and establishes a framework for the digital economy, including aspects related to AI. Franco-Chilean Binational Center for Artificial Intelligence: In November 2024, Chile and France signed an agreement to create this center, aiming to strengthen cooperation in AI research, innovation, and policy development. AI Action Summit Declaration: In February 2025, Chile signed the "Statement on Inclusive and Sustainable Artificial Intelligence for People and the Planet" during the AI Action Summit, emphasizing principles such as accessibility, transparency, and international cooperation in AI development. UNESCO's Recommendation on the Ethics of Artificial Intelligence - Inter-American Framework on Data Governance and Artificial Intelligence (MIGDIA): Chile participated in the development of this OAS initiative. - Santiago Declaration to Promote Ethical AI: Chile led the initiative and hosted the signing of this declaration to promote ethical AI in Latin America and the Caribbean
Costa Rica	Council of Europe Framework Convention on Artificial Intelligence: Costa Rica participated in drafting this international treaty, which aims to ensure AI systems uphold human rights, democracy, and the rule of law. OECD Ministerial Council Presidency 2025: As the upcoming president of the OECD Ministerial Council in 2025, Costa Rica will lead discussions on global economic policies, including those related

	to AI, under the theme "Leading the way towards resilient, inclusive, and sustainable prosperity through trade, investment, and innovation." UNESCO's Recommendation on the Ethics of Artificial Intelligence - Inter-American Framework on Data Governance and Artificial Intelligence (MIGDIA): Costa Rica participated in the development of this OAS initiative. - Santiago Declaration to Promote Ethical AI
El Salvador	UNESCO's Recommendation on the Ethics of Artificial Intelligence - Inter-American Framework on Data Governance and Artificial Intelligence (MIGDIA) - Santiago Declaration to Promote Ethical AI
Mexico	Global Partnership on Artificial Intelligence (GPAI): Mexico is a founding member of GPAI, an international initiative established to guide the responsible development and use of AI in a manner that respects human rights and democratic values. AI Action Summit Declaration: In February 2025, Mexico signed the "Statement on Inclusive and Sustainable Artificial Intelligence for People and the Planet" during the AI Action Summit, emphasizing principles such as accessibility, transparency, and international cooperation in AI development. UNESCO's Recommendation on the Ethics of Artificial Intelligence - Inter-American Framework on Data Governance and Artificial Intelligence (MIGDIA) - Santiago Declaration to Promote Ethical AI
Honduras	UNESCO's Recommendation on the Ethics of Artificial Intelligence - Inter-American Framework on Data Governance and Artificial Intelligence (MIGDIA) - Santiago Declaration to Promote Ethical AI

As a conclusion of this analysis, the six selected countries share three common frameworks:

- **UNESCO's Recommendation on the Ethics of Artificial Intelligence,**
- **the Inter-American Framework on Data Governance and Artificial Intelligence (MIGDIA), and the**
- **Santiago Declaration to promote ethical AI in Latin America and the Caribbean.**

DETERMINATION OF SHARED ETHICAL PRINCIPLES

Based on the shared frameworks—particularly the UNESCO Recommendation on the Ethics of AI—a standard set of ethical principles will be defined to guide this analysis. The Santiago Declaration and the Inter-American Framework on Data Governance and AI (MIGDIA) draw from UNESCO's ethical foundation.

TABLE 10. LIST OF PRINCIPLES FOR EACH FRAMEWORK

UNESCO's Recommendation on the Ethics of Artificial Intelligence	Santiago Declaration	MIGDIA
Proportionality and Do No Harm: AI systems must not exceed necessary actions to achieve legitimate aims and must avoid causing harm to individuals, society, or the environment.	**Respect for Human Rights:** AI must uphold all internationally recognized human rights in both design and deployment.	**Respect for Human Rights:** All data governance and AI initiatives must align with the Inter-American human rights framework.
Safety and Security: AI systems must prevent risks, vulnerabilities, and attacks throughout their lifecycle to ensure the safety of people and ecosystems.	**Proportionality and Non-Harm:** AI interventions should be appropriate to the risks involved and must avoid causing harm.	**Ethical Use of Artificial Intelligence:** Implementation of UNESCO's guidelines and adaptation to national contexts.
Fairness and Non-Discrimination: AI must promote social justice, prevent biases, and ensure inclusive access and benefits for all individuals and communities.	**Safety and Protection:** Systems must ensure the security and protection of individuals and society throughout the AI lifecycle.	**Transparency:** Full explainability and transparency in AI-driven decision-making processes, particularly when impacting individual rights.
Sustainability: AI development and deployment must support human, social, economic, cultural, and environmental sustainability goals.	**Equity and Non-Discrimination:** AI must promote fairness, avoiding bias and discrimination based on gender, ethnicity, or other characteristics.	**Accountability:** Clear assignment of responsibilities across the data and AI lifecycles, including auditing and reporting mechanisms.
Right to Privacy and Data Protection: AI systems must respect individuals' privacy and ensure personal data is collected, used, and managed lawfully and ethically.	**Gender Equality:** AI development must actively promote gender equity and prevent the reinforcement of gender biases.	**Privacy and Personal Data Protection:** Adoption of measures to safeguard personal data and ensure compliance with Inter-American privacy standards.
Human Oversight and Determination: Humans must retain ultimate responsibility over AI systems, especially for decisions impacting fundamental rights and safety.	**Inclusion:** Technologies must be designed to include diverse populations, ensuring no one is left behind.	**Inclusion and Non-Discrimination:** Guaranteeing that data and AI initiatives integrate rights-based, inclusive, and culturally sensitive approaches, particularly toward vulnerable groups.
Transparency and Explainability: AI systems must be understandable and their decision-making processes explainable to ensure accountability and protect rights.	**Cultural Diversity:** AI systems must respect and reflect the region's cultural richness and differences.	**Risk Assessment and Responsible Usage:** Application of proactive risk assessment and management measures, such as impact assessments, audits, and

		evaluations to mitigate negative effects.
Responsibility and Accountability: Clear assignment of ethical and legal responsibility for AI systems' outcomes must exist across all actors involved.	**Accessibility:** Technologies must be designed to be accessible to all, including persons with disabilities.	**Security and Integrity:** Promotion of cybersecurity measures to protect data and AI infrastructures and maintain the integrity and reliability of AI systems.
Awareness and Literacy: Public understanding of AI technologies and their societal impacts must be promoted to foster informed participation and protection.	**Social, Cultural, Economic, and Environmental Sustainability:** AI must contribute to sustainable development across social, cultural, economic, and environmental dimensions.	**Citizen Engagement:** Participation of citizens in the design, monitoring, and evaluation of data and AI governance initiatives.
Multi-Stakeholder and Adaptive Governance and Collaboration: AI governance must be inclusive, dynamic, and involve governments, private sector, academia, civil society, and marginalized groups.	**Right to Privacy and Protection of Personal Data:** AI must guarantee the privacy of individuals and safeguard personal data in accordance with human rights standards.	**Multi-Stakeholder Governance:** Creation of mechanisms involving civil society, academia, private sector, and government to ensure ethical oversight and accountability.
Proportionality and Do No Harm: AI systems must not exceed necessary actions to achieve legitimate aims and must avoid causing harm to individuals, society, or the environment.	**Human Oversight and Decision-Making:** Humans must remain in control over critical decisions, especially those impacting rights and freedoms.	**Sustainability and Environmental Responsibility:** Integration of environmental sustainability considerations into data governance and AI initiatives.
Safety and Security: AI systems must prevent risks, vulnerabilities, and attacks throughout their lifecycle to ensure the safety of people and ecosystems.	**Transparency and Explainability:** AI systems must be understandable, with clear processes that can be explained to users and affected parties.	**Open Government and Access to Information:** Alignment with open government principles to ensure openness, access, and transparency in the use of data and AI technologies.
	Responsibility and Accountability: Clear mechanisms must be in place to assign responsibility for AI actions and impacts.	**Cultural Diversity Recognition:** Promotion of initiatives that value and strengthen the region’s cultural diversity in the design and deployment of AI systems.
	Awareness and Education: Society must be informed and educated about AI technologies, their uses, risks, and ethical implications.	**Right to Redress:** Establishment of grievance mechanisms for addressing potential violations of ethical principles, rights, or data misuse.

After a detailed review and based on the list of principles identified in each of the three frameworks, the following ethical principles emerge as the core elements shared across all three frameworks, which will serve as the basis for the analysis presented in this document:

TABLE 11. SHARED ETHICAL PRINCIPLES

Principles shared by the Santiago Declaration, UNESCO's Recommendation & Inter-American Framework (MIGDIA)
1. Proportionality
2. Security
3. Fairness
4. Non-discrimination
5. Gender Equality
6. Accessibility
7. Sustainability
8. Privacy
9. Data Protection
10. Transparency
11. Human Rights
12. Accountability
13. Inclusiveness
14. Environmental Impact
15. Multi-stakeholder Collaboration

Finally, based on the understanding of each ethical principle provided in the frameworks, we can create a cross comparison for each one of the 15 shared ethical principles identified in Table 10.

TABLE 12. CROSS COMPARISON OF FRAMEWORK'S PRINCIPLES

Principle	Santiago Declaration	UNESCO's Recommendation	Inter-American Framework (MIGDIA)
1. Proportionality	AI use must be appropriate to context and risk, avoiding unnecessary harm.	Actions must balance benefits and risks, ensuring minimal intrusion on rights.	Measures must be suitable to purpose and not excessive, aligned with public interest.
2. Security	Promote secure AI systems to prevent misuse and ensure resilience.	AI should be robust, secure, and safe throughout its lifecycle.	Ensure technical and operational safeguards to protect systems and data integrity.
3. Fairness	Ensure AI fosters social inclusion and equal opportunities.	AI must promote equity and justice, avoiding systemic biases.	Systems should treat individuals equitably, respecting societal diversity.
4. Non-discrimination	Prevent bias and ensure AI does not reinforce inequalities.	Prohibit algorithmic bias based on race, gender, or other attributes.	Promote non-discriminatory design and use of AI technologies.
5. Gender Equality	Encourage gender-sensitive AI policies and tools.	AI must promote gender equity and avoid reinforcing stereotypes.	Support equal representation and participation across genders in AI development.
6. Accessibility	Guarantee access to AI tools for marginalized communities.	AI should be accessible to all, including persons with disabilities.	Ensure digital inclusion and equitable access to AI benefits.

7.	Sustainability	Align AI development with environmental protection and sustainability.	AI should contribute to sustainable development goals and ecological balance.	Foster eco-friendly AI innovations that minimize environmental harm.
8.	Privacy	Respect individual privacy in AI data collection and processing.	Uphold privacy rights, ensuring AI does not infringe upon personal autonomy.	Safeguard personal data, ensuring lawful and ethical data use.
9.	Data Protection	Implement strong data governance frameworks for AI.	Ensure secure, lawful data management respecting data subjects' rights.	Protect data through clear legal and technical mechanisms.
10.	Transparency	Promote clear understanding of AI processes and decisions.	Ensure explainability and traceability of AI operations and outcomes.	Provide accessible information about AI design and decision-making.
11.	Human Rights	Ensure explainability and traceability of AI operations and outcomes.	AI must uphold and promote fundamental rights and freedoms.	Ensure all AI activities are consistent with human dignity and rights.
12.	Accountability	Assign clear responsibilities in AI deployment and oversight.	Ensure legal and ethical liability for AI impacts.	Establish mechanisms for oversight, redress, and enforcement in AI governance.
13.	Inclusiveness	Promote participation from all sectors in AI policy and design.	Encourage stakeholder involvement, especially from underrepresented groups.	Support diverse input in AI development to reflect societal needs.
14.	Environmental Impact	Assess and mitigate AI's ecological footprint.	Address AI's energy use and environmental consequences.	Promote sustainable computing practices in AI ecosystems.
15.	Multi-stakeholder Collaboration	Foster regional and international cooperation on AI ethics.	Encourage global partnerships for responsible AI governance.	Support cross-sectoral coordination and regional integration on data and AI issues.

Principles Transversality

The analysis was conducted based on the ethical principles adopted by the countries in the sample. Although some metrics and indicators were evaluated individually per principle, the conclusions were built from a network perspective, emphasizing the importance of avoiding fragmented approaches or isolated checklists. The following Cross-Impact assessment was considered in the final conclusions.

By nature, ethical principles and fundamental rights are deeply interconnected and interdependent, shaping and reinforcing each other inseparably. A violation of one often triggers cascading effects on the others. For example, if an AI system compromises privacy, it may simultaneously impact other principles such as security, non-discrimination, personal data protection, or fundamental rights like freedom of expression.

Since AI systems generate systemic interactions and impacts, addressing them through an interconnected and transversal framework is essential. Rights do not exist in isolation, and AI systems, being socio-technical, relate to them in a complex and dynamic way. This complexity and dynamism necessitate a comprehensive and adaptable approach to assessing these impacts as interrelated nodes, which is key to ethical, anticipatory, and inclusive AI governance.

CHAPTER IV

4. ANALYSIS OF THE REGULATORY FRAMEWORKS

There is clear momentum for AI regulation globally and in Latin America. As of 2025 the region displays uneven progress in its regulatory efforts. This uneven progress could lead to AI development and deployment disparities, potentially hindering the region's overall AI competitiveness and innovation.

Some countries, such as Brazil and Chile, are at the forefront of regulatory development in the region. Brazil's comprehensive AI strategy (PBIA 2024–2028) and regulatory bill (PL 2338/2023) are an example to their commitment in regulating AI. These initiatives, which merge human rights commitments with risk-based controls, promote innovation and safeguard key rights such as data protection, non-discrimination, and transparency.

Costa Rica's new National AI Strategy (ENIA 2024–2027) is a good example of new engagements. It takes a rights-oriented approach and focuses on inclusion, equity, education, and infrastructure. The two legislative proposals, aimed at formalizing AI governance and ensuring responsible development, are still under legislative review, but their potential is promising.

Mexico is moving more gradually, with a proposed federal bill that specifically addresses AI governance and a multi-stakeholder alliance (ANIA) laying the groundwork for future regulation. The country's direction signals a growing interest, but progress remains slower than other regional countries.

El Salvador has enacted a law promoting AI development and intellectual property rights. It is not focused on ethical AI but does include some references to ethical use. However, it lacks explicit provisions for rights protection or institutional oversight, aligning more closely with a pro-innovation agenda.

Honduras currently lacks a national AI strategy or regulation, revealing a governance gap and limited preparedness for AI challenges.

TABLE 13. MAPPING OF AI REGULATION BY COUNTRY

Country	Type	Year	Responsible
Brazil	Brazilian Artificial Intelligence Plan (PBIA) 2024-2028 this plan aims to position Brazil as a global leader in AI by promoting sustainable and socially-oriented technologies across various sectors	2024	Ministry of Science, Technology and Innovation
	AI Regulatory Framework (Bill No. 2,338/2023: this bill is the 4th in regards of AI, it establishes a national regulatory framework for the development, use, and governance of AI systems, with a focus on human rights, responsible innovation, and market competitiveness The bill centers AI regulation around human rights, transparency, non-discrimination, and data protection. While it introduces risk categories, these are framed to **protect rights.** Previous Bills are: 5.051/2019; 21/2020 and 872/2021	2024	Senate
Chile	National Artificial Intelligence Policy 2021-2030: focus on Enabling conditions, and the ethical, regulatory and socioeconomic aspects of the development and adoption of AI.	2021 2024 (Update)	CENIA
	AI Regulatory Bills: 15869/2023; 15935-07/2023 and 16.021-07/2023.	2023	Chamber of Deputies

	They focus on the creation, development, innovation and implementation of AI systems and the safeguard of democratic principles. Prioritizes the protection of dignity, autonomy, and privacy. The 2024 bill proposes an institutional architecture to safeguard democratic principles and fundamental rights in AI use. And amends the penal Code to punish the misuse of AI and incorporates liability in the commission of an offense.		
Costa Rica	National Artificial Intelligence Strategy (ENIA) 2024-2027: Focuses on ethical and responsible adoption, emphasizing equity, accessibility, and rights-based safeguards—especially around digital inclusion and algorithmic fairness. Also Focuses on education, infrastructure, equitable access, and fostering local innovation	2024	Ministry of Science & Technology
	Bills Under Consideration: Bill 23.771/23: Law to regulate Artificial Intelligence: Status: Presented to the Legislative Assembly. Bill 23.919/23: Law for the Responsible Promotion of Artificial Intelligence in Costa Rica: Status: Presented to the Legislative Assembly	Presented in 2023, under consideration	Legislative Assembly
Mexico	Bill Under Consideration: Federal Law Regulating Artificial Intelligence	Presented on 2024, still under consideration as of April 2025	Senate
	National Alliance for Artificial Intelligence (ANIA): Its mission is to strengthen Mexico's AI ecosystem and lay the groundwork for future AI regulations	2023	Multi-Stakeholder Mechanism
El Salvador	Artificial Intelligence and Technologies Promotion Law: Promotes Development, reduces development liability and aims to support AI research, application, and intellectual property protection. While more innovation-driven, it still mandates ethical and responsible use, embedding references to human-centered AI development.	2025	Legislative Assembly
Honduras	As of now, Honduras does not have a specific regulatory framework governing AI.	_	_

While many countries reference ethics and human rights in their frameworks, there is variation in how deeply these values are embedded in policy and how effectively they can be enforced. Brazil, Chile, and Costa Rica are moving toward hybrid models that combine normative safeguards with tools for risk classification and mitigation, whereas others remain in early or exploratory stages.

The region is making progress in building its AI governance landscape but it's important to note that these efforts can come as fragmented and are limited in creating and overall vision for AI and national and regional development. The pace and depth of these efforts vary widely.

It is critical for the region to bridge these gaps. More robust regional synergy, multi-stakeholder coordination, institutional investment, and mechanisms for public accountability are necessary to ensure that AI systems support innovation and democratic values.

4.1 Governance approach to AI in selected countries

As described in previous chapters, there are different AI governance approaches, the most important being the rights-centered, risk-centered, or upcoming hybrid approach, which applies a human rights lens to a risk-based classification.

Latin America is moving forward in shaping its approach to AI governance with several frameworks already created.

TABLE 14. AI GOVERNANCE APPROACHES IN THE REGULATION OF SELECTED COUNTRIES

Regulation/Strategy	Country/ Region	Year	Approach	Justification
EU AI Act[9]	European Union	2024	Risk-Based	Uses a tiered, use-case-specific system of risk (unacceptable, high, limited, minimal) with proportional obligations. Establishes a tiered system of AI risk (unacceptable, high, limited, minimal) with obligations varying accordingly.
UNESCO Recommendation on the Ethics of AI	Global	2021	Rights-Based (though promotes a tiered risk framework)	Centers on human rights, inclusion, and sustainability as core principles, with emphasis on democratic oversight. Emphasizes human rights, dignity, fairness, and environmental sustainability as foundational principles. Promotes a tiered risk framework.
Brazil AI Regulation Bill (PL 2338/2023)[10]	Brazil	2023	Hybrid	Brazil's AI governance model combines a rights-based framework (via EBIA and Bill No. 2.338/2023) with risk-based oversight mechanisms imposing corresponding obligations. Human rights protections**:** Rights to explanation, non-discrimination, privacy, and data protection. Risk classification framework for AI **systems:** AI systems are categorized into different risk levels. This classification system is akin to the EU AI Act, proposing three risk levels: low, moderate, and high-risk AI systems. High-risk AI systems, such as those involving critical infrastructures or significant impacts on fundamental rights, face stricter regulatory requirements. For high-risk systems, and Algorithmic Impact Assesment (AIA) is require, including use of the precautionary principle.
Brazil-PBIA (2024-2028)[11]	Brazil	2024	Hybrid	This Strategy Focused on development and innovation but includes ethical and responsible AI guidelines inspired by OECD/UNESCO frameworks.

[9] https://artificialintelligenceact.eu/ai-act-explorer/

[10] https://www25.senado.leg.br/web/atividade/materias/-/materia/157233

[11] https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/noticias/2024/07/plano-brasileiro-de-ia-tera-supercomputador-e-investimento-de-r-23-bilhoes-em-quatro-anos/ia_para_o_bem_de_todos.pdf/view

Chile-AI National Policy	Chile	2021	Rights-Based	Emphasizes ethical use, data protection, and human-centric design; no formal risk tiering; public trust is central. Focuses on ethical and human rights considerations, promoting AI development that respects democratic principles and fundamental rights.
Chile -AI Regulatory Bill	Chile	2024	Risk-Based	Proposes regulatory sandboxes and differentiated obligations according to AI system impact and use; signals a shift toward a risk-oriented approach. Introduces a risk-based approach, classifying AI systems into categories of **unacceptable, high, limited, no evident risk** with corresponding regulations.
Mexico-National AI Strategy (CEDNIA)	Mexico	2018	Rights-based	Highlights digital inclusion, ethics, transparency, and human development; lacks a structured risk framework.
Mexico-ANIA (National Alliance for AI)	Mexico	2023	Hybrid to Rights-based	Aims to strengthen Mexico's AI ecosystem with a focus on ethical and responsible adoption, emphasizing human rights and inclusivity. Focuses on coordination across sectors for responsible AI development; blends innovation goals with ethical and human-centered principles.
EL Salvador-AI & Emerging Technologies Promotion Law	El Salvador	2025	PromotionMostly Rights-based	Aims to incentivize AI adoption and position the country as an innovation hub; limited discussion of ethical or human rights safeguards. Promotes AI development and application while ensuring responsible use, emphasizing transparency, fairness, and accountability.
Costa Rica-ENIA	Costa Rica	2024	Rights-based	Focus on ethical principles such as human dignity, transparency, equity, and human oversight.
Santiago Declaration	Regional (Latin America)	2023	Rights-Based	Explicitly rights-focused; calls for public oversight, transparency, inclusion, and prevention of AI-enabled rights violations.
US AI Executive Order **(Revoked by the Trump Administration, 2025)**	United States	2023	Risk-Based	Prioritizes risk mitigation and national security, using sector-based and use-case assessments. Sector-based risk assessments and regulatory guidance, especially in national security, health, and labor.
Inter-American Model Law (MIGDIA)	Inter-American (OAS)	2022	Rights-Based	Strong rights-oriented framing on data protection and transparency; includes AI implications tied to data handling and algorithmic fairness.
OECD AI Principles	OECD Members	2019	Hybrid	Combines human-centric values with innovation and economic growth; encourages risk management and accountability mechanisms. references to both risk management and human rights.

The region is trying to have more participation in global regulatory discussions, and its presence have been increasing though more representation should be promoted. However, it faces a key decision: prioritize risk-based frameworks, focus on rights-based models, or adopt hybrid strategies that incorporate both. The documents reviewed suggest that the global debate already influences national and regional approaches to AI Governance, being the EU AI Act from the European Parliament and Council of the European Union (2024), one of the most influential frameworks in the region.

Most Latin American countries have anchored their AI strategies on rights-based values. Regional commitments adopted by most countries like the Santiago Declaration and the Inter-American Model Law (MIGDIA) reflect firm commitments to human dignity, transparency, equity, and democratic oversight. Countries such as Chile, Costa Rica, and Mexico emphasize ethical and human rights principles in their policy designs, even though enforcement mechanisms often remain vague or underdeveloped.

A shift toward risk-oriented regulation can be perceived, primarily influenced by global frameworks like the EU AI Act. Brazil's proposed legislation (PL 2338/2023) and Chile's 2024 bill introduced classifications of AI systems by risk level and set obligations based on potential harm. These efforts show a growing recognition of the need to address sector-specific risks and impacts, particularly in sensitive areas like healthcare, policing, and public services.

However, critiques from scholars and civil society underline the weaknesses of risk-based models. These approaches may fail to capture structural inequalities and can underestimate the harms embedded in "low-risk" systems or that it could rely on liability better than Ex-Ante prohibition (Kretschmer, M., Kretschmer, T., Peukert, A., & Peukert, C. 2023).

More recently, scholars are calling on moving towards a more hybrid model of AI governance or an Adaptive-Hybrid AI Governance framework (Sharma, S. 2023) that can integrate technical, ethical, and societal regulatory mechanisms to guide the development of ethical AI and manage its associated risks in a very fast pace environment. Examples of this are Brazil's regulation and Mexico's ANIA initiative whose frameworks integrate rights protections with risk assessment and mitigation tools. This blend balances innovation with safeguards, ensuring that AI development remains flexible and anchored in human rights.

TABLE 15. SUMMARY_AI GOVERNANCE CLASSIFICATION

RISK-BASED	RIGHTS-BASED	HYBRID	PROMOTION
• EU AI Act • US AI Executive Order (Revoked by the Trump Administration) • Chile -AI Regulatory Bill	• UNESCO Recommendation on the Ethics of AI • Santiago Declaration • Chile-AI National Policy • Inter-American Model Law (MIGDIA) • Costa Rica-ENIA • Mexico-National AI Strategy (CEDNIA) • Brazil-EBIA (2024-2028)	• OECD AI Principles • Brazil AI Regulation Bill (PL 2338/2023) • Brazil-EBIA (2024-2028)	• EL Salvador-AI & Emerging Technologies Promotion Law • (Some ethical & Risk mitigation considerations)

These efforts also reflect an interest to reconcile international standards with regional identity. While influenced by global norms such as those set by the EU and UNESCO, Latin America also is trying to generate its frameworks rooted in social justice, inclusion, and historical awareness.

4.2 System Transversality Across AI-Lifecycle

The life cycle of AI technologies is geographically fragmented—a system might be designed in the U.S., trained in Europe, and deployed in Latin America. This complicates the attribution of legal responsibility and creates gaps in accountability chains.

A key observation, consistent with a systems-thinking approach, is that Latin America imports and adopts the vast majority of the artificial intelligence models it uses. In many cases, this adoption occurs without any mechanisms for control, oversight, or filtering by national governments. If states lack access to information and regulatory capacity over a substantial portion of these systems' lifecycle, then—following the same principle of transversality—they cannot ensure their ethical compliance.

While regulatory or institutional tools can mitigate certain risks and exert greater influence during the deployment and usage stages, it must be acknowledged that, under this logic, no ethical principle can be fully guaranteed if the planning and development phases remain outside the region's regulatory reach. As such, all ethical and normative frameworks must consider this structural limitation when addressing the governance of AI systems not developed locally.

4.3 Territoriality Principle

Even at the deployment stage, the legal principle of territoriality poses significant challenges to Latin American countries' ability to enforce their legislation on artificial intelligence (AI). This principle in international law, which dictates that a state may only exercise its jurisdiction within the boundaries of its territory, severely limits the scope of accountability and legal liability for AI systems. A country can only legislate and enforce rules over activities, individuals, or entities with a physical or legal presence within its territory, creating a complex regulatory landscape.

When a tech company—such as a Big Tech firm—operates from abroad but its AI systems have a local impact, the capacity of states to demand accountability is drastically reduced due to the following reasons:

- **Lack of local legal presence:** Many global companies do not have legal headquarters or subsidiaries in the countries where they provide services. This lack of local legal presence is a significant barrier to enforcing local laws, as national regulatory frameworks cannot be directly applied without it.
- **Inability to enforce sanctions:** If a national authority imposes a sanction on a foreign company without local assets or representation, there are no effective mechanisms to ensure compliance.
- **Limited access to evidence and data:** Investigations into violations—such as data misuse or algorithmic bias—require access to data, source code, or technical documentation. If these are stored on servers abroad, they fall outside the reach of national jurisdiction.
- **Fragmented legal responsibility:** AI systems often have globally distributed value chains. A model may be trained in one country, deployed from another, and used in a third. This fragmentation complicates the clear attribution of legal responsibility at each stage of the system's life cycle.
- **Legal and economic power asymmetries:** Many states lack the technical, economic, or political capacity to challenge large tech platforms. This creates regulatory gaps that allow companies to operate without complying with national regulations or under weak or inconsistent legal frameworks.

"During my tenure as National Director of the Data Protection Agency for the Inhabitants in Costa Rica (PRODHAB), I concluded that the only way to strengthen respect for our Latin American countries is through coordination mechanisms in which authorities work together under a common agenda. Neither the internet nor the principle of extraterritoriality of laws should justify impunity or the violation of rights by digital platforms."

Ana Karen Cortés. Former PRODHAB Director (March 2025) personal interview.

As a result, states experience diminished digital sovereignty and reduced ability to protect their citizens. Individuals could be affected by unfair automated decisions, algorithmic discrimination, or data misuse. The lack of effective redress mechanisms or and opaque content moderation createms can creating a potential regime of technological impunity where powerful actors evade local legal accountability.

To overcome these limitations, it is necessary to better understand how the principle of territoriality works in a globalized digital environment, where National regulations in Latin America don't have any type of extraterritorial reach. Extraterritoriality refers to the application of a country's laws beyond its borders.

It must be complemented by international cooperation agreements, requirements for local legal presence, and extraterritorial mechanisms such as mandatory compliance clauses for digital services. Without such measures, accountability and legal liability for AI systems will remain ineffective in the face of global actors.

CHAPTER V

5. CROSS-TABULATION OF SHARED ETHICAL PRINCIPLES

For each of the 15 Share ethical principles (Table 10) will be contrasted with the enabling conditions required for its implementation and the metrics retrieved from the main sources. This analysis used metrics, policies, and references from various sources. The main ones are cited here, but it is recommended to refer to the Bibliography for the complete list of sources and additional information. Specific references can be found in the Bibliography and footnotes.

.

TABLE 16. MAIN SOURCES & REGULATION MAPPING

Source	Description	Author/year	Retrieved from
Unesco Recommendation on Ethics Artificial Intelligence	UNESCO's first-ever global standard on AI ethics – the 'Recommendation on the Ethics of Artificial Intelligence', adopted in 2021, is applicable to all 194 member states of UNESCO.	Unesco, 2021	https://www.unesco.org/en/articles/recommendation-ethics-artificial-intelligence
The Santiago Declaration	The Santiago Declaration, endorsed by representatives from 24 countries, sets out core principles for the ethical governance of artificial intelligence (AI) in Latin America and the Caribbean. In line with UNESCO's guidelines, it prioritizes human rights, transparency, and accountability in the deployment of AI.	2023, Updated 2024	https://www.unesco.org/en/articles/authorities-24-countries-participate-1st-forum-high-authorities-ethics-artificial-intelligence-latin
IEEE_The Role of Artificial Intelligence in Latin America's Energy Transition	The role of Artificial Intelligence (AI) in Latin America's energy transition is multifaceted, focusing on improving energy efficiency, enhancing renewable energy integration, and optimizing energy systems.	Meza Jiménez, V. M., & Pérez, E. 2022	https://ieeexplore.ieee.org/document/9904766
HAI_AI Index 2024 Annual Report	Overview of current trends and advancements in artificial intelligence Globaly.	Maslej, N., Fattorini, L., Perrault, R., Parli, V., Reuel, A., Brynjolfsson, E., Etchemendy, J., Ligett, K., Lyons, T., Manyika, J., Niebles, J. C., Shoham, Y., Wald, R., & Clark, J. 2024	https://hai.stanford.edu/ai-index/2024-ai-index-report
ILIA Report 2024	The ILIA (Latin American Artificial Intelligence Index) 2024 evaluates the readiness and progress of AI development in 19 countries across Latin America and the Caribbean.	National Center for Artificial Intelligence (CENIA) and the Economic Commission for Latin America and the Caribbean (ECLAC)	https://indicelatam.cl/

		2024	
ILO_Labour Overwiew of latin America & Caribbean	REPORT_Labour Overwiew of Latin America & Caribbean	ILO Regional Office for Latin America and the Caribbean 2024	https://www.ilo.org/publications/2024-labour-overview-latin-america-and-caribbean
Buffer or Bottleneck? Employment Exposure to Generative AI and the Digital Divide in Latin America, ILO Working Paper 121		Gmyrek, P., Winkler, H., Garganta, S ILO 2024	https://www.ilo.org/publications/buffer-or-bottleneck-employment-exposure-generative-ai-and-digital-divide
AI and the Increase of Productivity and Labor Inequality in Latin America	REPORT_AI's deployment, particularly large language models (LLMs), in Latin America is poised to enhance productivity while exacerbating labor inequality.	Azuara Herrera, Oliver;Ripani, Laura; TorresRamirez,Eric. IaDB, 2024	https://publications.iadb.org/en/ai-and-increase-productivity-and-labor-inequality-latin-america-potential-impact-large-language
IMF – Gen-AI: Artificial Intelligence and the Future of Work	REPORT_Artificial Intelligence (AI) has the potential to reshape the global economy, especially in the realm of labor markets.	Mauro Cazzaniga, Florence Jaumotte,Longji Li,Giovanni Melina, Augustus J Panton, Carlos Pizzinelli, Emma J Rockall, Marina Mendez Tavares IMF, 2024	https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2024/01/14/Gen-AI-Artificial-Intelligence-and-the-Future-of-Work-542379
CAF_AI and the SDGs in Latin America and the Caribbean	The Comprehensive Action Framework (CAF_AI) for Artificial Intelligence in Latin America and the Caribbean integrates with the Sustainable Development Goals (SDGs) to enhance regional development.	Jean García Periche and Cristina Martínez Pinto, Stimson Fellows CAF, Microsoft 2024	https://scioteca.caf.com
Critical Minerals for Energy Transitions of Latin America and the Caribbean	Analyzes the role of Latin America and the Caribbean (LAC) in the global supply of critical minerals essential for the energy transition toward low-carbon systems.	Siroit, G. OLADE 2024	https://www.olade.org/en/publicaciones/study-on-critical-minerals-in-the-region/
OLADE - Latin American Energy Organization	The Latin American Energy Organization (OLADE) is an intergovernmental public body of cooperation, coordination and technical advisory, established on November 2, 1973 by signing the Lima Agreement, ratified by 27 countries in Latin America and the Caribbean, with the fundamental objective of promoting the integration, conservation, rational use, commercialization and defense of the region's energy resources.	_	https://www.olade.org/en/

LatamGPT Initiative	A Latin American initiative to develop a language model built entirely in the region.	National Artificial Intelligence Center (CENIA), Chile 2025	https://latamgpt.org/en

Regulatory Frameworks	
Country/Regulation	Retrieved from
Brazil_Brazilian Artificial Intelligence Plan (PBIA) 2024-2028	https://es.scribd.com/document/754674641/IA-Para-o-Bem-de-Todos#fullscreen&from_embed
Brazil_AI Regulatory Framework (Bill No. 2,338/2023	https://www25.senado.leg.br/web/atividade/materias/-/materia/157233
Chile_National Artificial Intelligence Policy 2021-2030	https://www.minciencia.gob.cl/areas/inteligencia-artificial/politica-nacional-de-inteligencia-artificial/
Chile_AI Regulatory Bills: 15869/2023; 15935-07/2023 and 16.021-07/2023.	https://www.bcn.cl/leychile/navegar?idNorma=1210664&idVersion=2025-01-28
Costa Rica_National Artificial Intelligence Strategy (ENIA) 2024-2027	https://www.micitt.go.cr/search/node?keys=Inteligencia+artificial
Mexico_National Alliance for Artificial Intelligence (ANIA)	https://www.ania.org.mx/
El Salvador_Artificial Intelligence and Technologies Promotion Law	https://www.asamblea.gob.sv/node/13492

At this stage, the study will examine the shared ethical principles. It is important to note that, although 15 principles were initially identified, they have been consolidated into 11 items. This consolidation was done to enhance clarity and synthesis, as some principles were closely related and could be effectively grouped in pairs.

5.1 Proportionality

TABLE 17. PRINCIPLE OF PROPORTIONALITY CROSS-TABULATION

Brazil and Chile have made explicit efforts to incorporate the proportionality principle into their AI regulatory frameworks. Costa Rica's strategy suggests an implicit adherence, while Mexico's fragmented approach lacks a clear application of proportionality. El Salvador's recent law does not explicitly address proportionality, and Honduras has yet to develop AI-specific regulations.		
Indicator: Risk-Based Proportionality		
Approach	Country	Mechanism
Risk-Based Proportionality: Based on mitigating potential harms by regulating AI systems according to the level of risk they pose.	Brazil	AI legislation incorporates the principle of proportionality by advocating for regulations that are commensurate with the risk levels of AI applications classified in low, moderate, and high-risk.

High-risk systems (e.g., biometric surveillance, employment AI) face strict compliance requirements (impact assessments, documentation, human oversight). Low-risk systems (e.g., spam filters) face minimal regulation. Preventive in logic: Applies controls before harm occurs, proportional to the risk estimation.		Proportionality Principle based on preventive measures and mitigation strategies For high-risk systems, an Algorithmic Impact Assesment (AIA) is require, including use of the precautionary principle.
	Chile	AI systems classified into categories of unacceptable, high, limited, no evident risk with corresponding proportional regulatory measures.
Indicator: Rights-Based Proportionality		
Approach	Country	Mechanism
Rights-Based Proportionality: ties proportionality to human rights standards, ensuring that any impact on rights is justified, necessary, and minimized. Any interference with rights by an AI system must meet: Necessity: Does the AI system pursue a lawful, necessary goal? Is it appropriate to achieve that goal? Proportionate in scope and impact & Least Restrictive Means: Could the goal be achieved in a way less intrusive to rights?	Costa Rica	**Based on the national AI Strategy (ENIA) proportionality is address based on justified, necessary and least harmful AI interventions.** In line with Human rights Law It also promotes **context-sensitive application** of ethical principles, which considers proportional adjustments based on use-case sensitivity. No Human-Rights Proportionality Test equivalent
Indicator: Approach Unaddressed		
Approach	Country	Mechanism
Unaddressed or Unclear	El Salvador	El Salvador passed the Artificial Intelligence and Technologies Promotion Law to promote AI development. While the law outlines principles like transparency, fairness, and accountability, it omits explicit mention of the principle of proportionality, leaving its relevance and application uncertain.
	Mexico	Lacks a comprehensive National Strategy or unified framework leaving the application of the Proportionality principle challenging to assess

	Honduras	Honduras currently has no specific legislation or formal regulatory framework for AI. In the absence of such guidance, the application of the proportionality principle in AI regulation remains unaddressed.
Indicator: Global Benchmark		
The AI Index 2024 Annual Report	Not defined directly in the report, but balancing immediate and long-term AI risks is mentioned. Emphasis on matching the regulatory or mitigation effort to the actual and anticipated risk level.	
MAIN INSIGHTS		

Emerging but Uneven Adoption
Brazil and Chile are the only countries in the region that have explicitly incorporated the principle of proportionality into their AI regulatory frameworks.

Proportionality is typically embedded in Human Rights Impact Assessments (HRIAs) and Algorithmic Impact Assessments (AIAs), where it serves to balance the potential benefits of AI systems against risks to individual rights.
However, the limited use of HRIAs and AIAs across the region means that proportionality is rarely applied in practice.

Barriers to Implementation
Most countries face similar challenges: vague legislative language, absence of enforcement mechanisms, and lack of public participation.
These conditions prevent meaningful application of proportionality, especially in high-risk domains such as welfare, policing, and healthcare.

Need for Regional and Contextual Approaches
Addressing these gaps requires the development of context-specific frameworks and tools, as well as improved institutional capacity for risk assessment and monitoring.
Regional coordination could help standardize minimum thresholds for proportionality in AI governance.

Global Engagement as Opportunity
Participation in international AI safety and human rights dialogues can support Latin American countries in embedding proportionality through best practices and shared regulatory models.

Momentum Through Reform
While implementation is still limited, national reforms and regional advocacy suggest growing political and institutional interest in adopting proportionality as a governance standard for AI.

Independently of the approach, whether is risk or rights based, enforcement is very weak

5.2 Security

TABLE 18. PRINCIPLE OF SECURITY CROSS-TABULATION

Indicator: Secure AI systems to prevent misuse and ensure resilience	
Latin America lacks the development of its own foundational models, and existing native models are not commercially oriented. This significantly limits control over security indicators during the planning, design, and development stages. As a result, the security of artificial intelligence systems in the region cannot be guaranteed either conceptually or operationally. .	
Sub Indicator: Cybersecurity	
Regional Status	Country Status
A Growing Threat: The region has experienced a 25% average annual growth in disclosed cyber incidents over the past decade, making it the fastest-growing area globally for such incidents. This surge is attributed to rapid digitalization, insufficient cybersecurity measures, and the increasing sophistication of cybercriminals. The region's average cybersecurity score is 10.2 out of 20, indicating significant vulnerabilities **Advancements in Cybersecurity Capacity:** Several Latin American nations have developed national cybersecurity strategies and established dedicated institutions to address cyber threats. **Challenges in Implementation and Enforcement:** Despite	**Brazil:** Mature but under constant threat. One of the most targeted LATAM countries for cyberattacks, particularly in finance and government sectors. Brazil's AI law, also known as the AI Regulatory Framework (Bill 2338/2023), was approved by the Senate in December 2024. The law establishes guidelines for the use and development of AI in Brazil Brazil implemented the General Data Protection Law (LGPD) and established a National Cybersecurity Strategy (E-Ciber). Ongoing investment in AI and cloud security, with 72% of organizations adopting integrated security platforms (Cisco report 2024[13]). Challenges: High volume of phishing, ransomware, and financial fraud. **Chile:** Advancing with significant reforms. Passed a Cybersecurity and Critical Infrastructure Law (2023) to regulate digital safety. Established CSIRT-Chile[14] as a national incident response team. Targeted in ransomware attacks (e.g., Army data leak in 2022), prompting investment in AI-enabled network automation (60% adoption expected by 2026). Focus areas: Legal modernization, infrastructure protection, workforce development. **Costa Rica: Recovering** and strengthening. After the major 2022 ransomware attack[15], Costa Rica declared a state of emergency and launched its 2023–2027 National Cybersecurity Strategy. International collaboration has increased; notably, the U.S. pledged $25 million for a national cyber operations center by 2026[16]. Focus areas: Institutional strengthening, public-private cooperation, and capacity building. **El Salvador:** Developing with limited infrastructure.

[13] The Cisco 2024 Threat Trends Report
[14] https://csirt.gob.cl/
[15] Datta, P. (2022). Ransomware and Costa Rica's national emergency: A defense framework and teaching case. Journal of Information Technology Teaching Cases, 14(4), 204388692211490. https://doi.org/10.1177/20438869221149042
[16] US Embassy in Costa Rica. https://cr.usembassy.gov/united-states-announces-25-million-to-strengthen-costa-ricas-cybersecurity/

these efforts, the region faces challenges in effectively implementing and enforcing cybersecurity measures **Resource Limitations:** Many countries grapple with insufficient financial and human resources dedicated to cybersecurity, hindering the development and maintenance of robust defense mechanisms. **Rapid Digitalization**: The swift adoption of digital technologies has outpaced the establishment of adequate cybersecurity infrastructure, leading to vulnerabilities. **Regulatory Gaps**: Inconsistent or outdated legal frameworks across the region impede the enforcement of cybersecurity policies and the prosecution of cybercriminals. Ransomware: The annual cost of cyberattacks in Latin America and the Caribbean could exceed $90 million by 2025, with an average of more than 18.5 million attacks per year12. Countries such as Costa Rica, Chile, Panama, and Colombia stand out as recent victims of ransomware in the region.	Has recently passed cybersecurity and data protection laws that create a national framework for cybersecurity, known as the Cybersecurity and Information Security Law (2024) Recent public sector initiatives aim to improve digital government services17, increasing urgency for better cyber defense. Vulnerabilities: Limited cyber workforce, minimal private-sector engagement, low incident reporting capacity. Needs: National strategy, international cooperation. **Mexico:** Intermediate with growing challenges. Has a National Cybersecurity Strategy (2017) but no comprehensive Cybersecurity Law. Increased cyberattacks in finance, energy, and government (e.g., 2022 SEDENA hack). during 2023, Mexico became the most attacked country in Latin America, suffering over 14 million attacks. Rising focus on public-private collaboration and data protection compliance. Gaps: Outdated infrastructure, slow regulatory adaptation, limited resources in small and medium enterprises (SMEs). **Honduras:** Early-stage with high vulnerability. Cybersecurity policies are fragmented; no national strategy in force. Institutions have limited cyber capabilities. Regional initiatives underway to strengthen digital safety, with support from OAS and IDB. Needs: Legal framework, capacity building, awareness programs.

[12] Cyber Readiness in Latin American Public Sectors - Metabase Q. https://www.metabaseq.com/e-book/cyber-readiness-in-latin-american-public-sectors/

[17] US International Trade Administration
https://www.trade.gov/market-intelligence/el-salvador-ict-cybersecurity-and-information-security-law

<table>
<tr><td colspan="2">Indicator:Fraud & Scams</td></tr>
<tr><td>Prevalence of Fraud[18] : Latin America leads globally in credit card fraud, with rates 97% higher than North America and 222% higher than the Asia-Pacific region. The region also experiences the highest revenue loss to fraud, at 20%.

Digital Adoption and Risks: Rapid technological inclusion has increased internet usage, with 77.9% of the population online as of 2022. This surge has been accompanied by a rise in payment fraud and cyberattacks.

Based on an assessment made by INTERPOL in 2024[19] the most prevalent forms of fraud in the Americas include impersonation, romance scams, tech support scams, advance fee schemes, and telecom fraud.
Emerging reports indicate that Latin American criminal organizations, including Commando Vermelho, Primeiro Comando da Capital (PCC), and Cartel Jalisco New Generation (CJNG), are also participating in financial fraud schemes.</td>
<td>Brazil:
• Scam Encounters: 83% of respondents reported encountering a scam at least monthly.
• Financial Losses: 41% acknowledged losing money to scams, with an average loss of R$4,784.
• Underreporting: 56% of victims did not report scams to law enforcement, reflecting distrust in the system's capacity to respond effectively.

Chile:
• Financial Crimes: The Carabineros Fraud case, one of the biggest corruption scandals, involved embezzlement within the national police force, highlighting vulnerabilities to financial crimes.

Costa Rica:
• Scam Attempts: 26% of households experienced scam attempts, with 4.9% reporting that a family member became a victim.
• Scam Characteristics: In 42% of cases, personal data was requested; in 16.4%, a payment was demanded.

El Salvador:
• Specific data on online fraud and scams in El Salvador is limited. However, the country's increasing internet penetration and digital adoption suggest a growing need for robust cybersecurity measures.

Mexico:
• Cybercrime Prevalence: In the first half of 2024, Mexico accounted for over half of all cyber threats reported in Latin America, with 31 billion cybercrime attempts.
• Targeted Sectors: Cybercriminals have been focusing on logistics, automotive, and electronics manufacturing sectors.

Honduras:
• While specific statistics on online fraud in Honduras are scarce, the country's growing digital landscape necessitates increased attention to cybersecurity to protect users from potential scams.</td></tr>
<tr><td colspan="2">Indicator: Global Benchmark</td></tr>
</table>

[18] https://www.threatmark.com/

[19] Interpol: Financial fraud Assessment: A Global Threat Boosted by Technology https://www.interpol.int/en/News-and-Events/News/2024/INTERPOL-Financial-Fraud-assessment-A-global-threat-boosted-by-technology

The HAI AI Index 2024 Annual Report	**Core Security and Safety Dimensions** • *Integrity of AI systems*: Protection against cyberattacks, adversarial manipulation, model leaks. • *Safety from misuse*: Addressing risks from use in cyberattacks, automated hacking, and other harmful applications. • *Inherent risks*: Mitigation of hallucinations, reliability issues, and long-term existential threats. **Adversarial and Transferable Attacks** Discovery of universal adversarial attacks like *Greedy Coordinate Gradient (GCG)* that bypass safety layers in multiple large language models (LLMs). These attacks generate unsafe outputs even from aligned models using unintelligible suffix prompts, showing vulnerabilities across ChatGPT, Claude, Bard, Llama-2, and Pythia. 86% support globally agreed-upon governance for generative AI due to its security implications. **Safety Benchmarks and Evaluation Gaps** Introduction of new datasets and benchmarks like *Do-Not-Answer* and *MACHIAVELLI* to test ethical behavior, deception, and safety under complex social interactions. Most models still fail to filter unsafe outputs reliably, and safety evaluation methods for open-source models remain underdeveloped. **Data Leakage and Memorization Risks** Research shows that both open and closed models (e.g., ChatGPT, Pythia) can leak training data, including PII and copyrighted content, under specific prompt patterns. Techniques like repeating benign tokens (e.g., “poem”) caused models to spill sensitive or verbatim training data, exposing risks in data security and privacy . AI-related incidents (e.g., misuse, deepfakes) increased by over 30% from 2022 to 2023. Threats amplified by AI include disinformation, phishing, and deepfake generation, highlighting the urgent need for coordinated security standards. **Industrial and Regional Readiness** Varying adoption of AI-related cybersecurity measures across industries and regions. Latin America shows relatively higher operationalization rates of cybersecurity measures compared to Europe or North America. **Limitations in Current Red-Teaming** Most red-teaming efforts focus on interpretable prompts; recent research shows models remain highly vulnerable to unintelligible or indirect prompts not covered by standard safety evaluations. This synthesis shows that while security is gaining prominence in AI development, foundational gaps remain in adversarial resilience, data protection, risk accountability, and global coordination.

Indicator: Testing Ground for Frontier Technology & Surveillance Technology
Autonomous systems are being tested in the Global South due to more lenient regulatory environments. Although they have not yet been widely deployed in Latin America, the absence of proper conditions and regulations could pose a threat to human life and security. For example, Mercedes-Benz launched a pilot project for its S-Class self-driving vehicle in South Africa[20] Countries with less stringent regulations may facilitate faster deployment, but the lack of robust regulatory frameworks increases risks related to safety and liability. **Increase in Biometrics and Surveillance Technologies, such as Facial Recognition Technology (FRT):** The study ***"Facial Recognition in Latin America: Trends in the Implementation of a Pervasive Technology"*** by Venturini and Garay (2021) identifies 38 FRT initiatives across nine countries—Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Panama, Paraguay, and Peru—highlighting the rapid and largely unregulated deployment of facial recognition systems in the region. Over 60% of these projects operate without a specific legal framework. Existing laws are either vague or absent, and most implementations lack any form of human rights impact assessment. It is worth noting that efforts in datasets such as the *"Latin American Image Database for Facial Recognition"* developed by Di Ielsi and Negri (2021) aim to address the absence of facial image data representing Latin American individuals, seeking to reduce demographic bias in training and evaluation processes. However, surveillance technologies like FRT frequently encode and reproduce the biases of their developers, with notably higher error rates for non-white and non-male faces which could put Latin Americans in a more vulnerable position. In the context of law enforcement, this amplifies the risk of discrimination and wrongful identification, exacerbating existing social inequalities.
MAIN INSIGHTS
Foundational Model Dependency and Vulnerabilities The region lacks domestically developed foundational models. Existing native models are non-commercial and lack standardized security practices. As a result, security cannot be embedded early in the AI lifecycle, making systems inherently more vulnerable. **Unprepared Public and Private Sectors** AI is evolving faster than institutional capacity to regulate or secure it. Most governments and companies lack the technical infrastructure and workforce to implement robust cybersecurity strategies in AI systems. **Surging Digital Threats** Cyberattacks, phishing, and digital fraud are increasing sharply. The expected annual cost of cyberattacks could surpass $90 million by 2025.

[20] https://mercedesblog.com/going-autonomous-in-south-africa-the-self-driving-mercedes-benz-s-class-has-reached-cape-town/#google_vignette

Weak digital literacy and the absence of widespread cybersecurity training among the population exacerbate the problem.

AI as a Tool for Organized Crime
Criminal groups like CJNG, PCC, and Commando Vermelho are actively adopting AI.
These organizations exploit AI for logistics optimization (e.g., drug routes), evading law enforcement, and conducting financial fraud.
They offer competitive salaries to tech professionals, outcompeting legal institutions in talent acquisition.

Talent and Infrastructure Imbalance
Criminal organizations often have more technological resources and financial incentives than public agencies.
This growing gap threatens the ability of states to counter AI-enabled criminal strategies.

Urgent Need for Regional Coordination
Security challenges are transnational; no single country can respond in isolation.
Cross-border and regional collaboration will be essential to track, deter, and disrupt AI-driven criminal networks.

Strategic Blind Spots in Governance
Without regional AI governance mechanisms, there is limited enforcement capacity against misuse.
There is also a lack of protocols for auditing, red-teaming, or certifying model safety and robustness across borders.

Populations with limited digital resilience are at higher risk of manipulation, identity theft, or exploitation.

Public institutions must invest in digital literacy and awareness as a security imperative.

Techno-solutionism and Risk:
Facial Recognition Technologies (FRT) are gaining momentum. Often seen as a quick fix, present governments with significant challenges—particularly in data protection, regulatory preparedness, and the potential for misuse or systemic errors. This underscores the need for critical evaluation and a sense of responsibility.
These surveillance technologies, such as FRT systems, often reflect the biases of their creators, with disproportionate accuracy failures on non-white, non-male faces, which implies a high risk of low accuracy in Latino populations, risking the deepening discrimination, especially in law enforcement.

AI security in Latin America is not only a technical challenge but a strategic, governance, and social vulnerability requiring immediate attention.

5.3 Fairness & Non-Discrimination

TABLE 19. PRINCIPLES OF FAIRNESS & NON-DISCRIMINATION

Fairness and Non-Discrimination principles should be part should be part The development of artificial intelligence models in the region remains limited. However, countries such as Brazil and Chile have begun to distinguish themselves in the creation and training of locally developed models.

Notably, these initiatives place strong emphasis on the principle of fairness, prioritizing inclusiveness, representation, and open access.

Indicator: Avoiding Systemic Bias on AI Models (Equitable Treatment of Individuals or Groups, Social Inclusion and Equal Opportunities)	
Country/Model	Description
LatamGPT Initiative (Regional/ led by Chile)	Latam-GPT is a collaborative artificial intelligence initiative led by CENIA in Chile and designed to represent the diverse cultures, languages, and histories of Latin America and the Caribbean by focusing on regional specificity. The approach to the Fairness Principles includes Cultural and Linguistic Representation: Trained on data that encapsulates the unique linguistic patterns and cultural nuances of Latin American countries to accurately reflects the region's diversity, thereby reducing biases inherent in models trained predominantly on data from other regions. Collaborative Development: 30 institutions and 60 experts from various Latin American countries participated fostering a collective effort to create an AI model that serves the entire region. This inclusive development process helps mitigate biases by incorporating a wide range of perspectives and expertise. Public and Open Access: Latam-GPT is designed to be a public, open, and inclusive model. Addressing Regional Issues: The model is tailored to understand and address topics pertinent to Latin America, including semantic and dialectal differences, historical contexts, and cultural references to ensures that is more equitable and relevant to the populations it serves
TeenyTinyLlama Model	Language-Specific Focus: trained exclusively on Brazilian Portuguese aims to reduce dependency on multilingual or English-dominant models that often carry cultural and linguistic biases from the Global North. This enhances linguistic representation and relevance for Portuguese-speaking users in Brazil. Open-Source and Transparent Development: Released under the Apache 2.0 license, the model is openly accessible. This transparency supports collaborative efforts to assess and mitigate potential biases. Research-Oriented, Not for Deployment: The model is explicitly not intended for deployment. Its purpose is to serve as a research tool for studying small-scale LLMs and their behavior in underrepresented languages. Ethical AI: The project is supported by RAIES (Rede de Inteligência Artificial Ética e Segura), indicating an alignment with responsible and fair AI practices in the Latin American context. Enabling Local Adaptation: By providing a small-scale, language-specific model, it empowers local researchers to fine-tune or audit for culturally relevant fairness issues, lowering barriers to entry and promoting inclusive development.
Brazil	Brazil’s AI efforts prioritize fairness and the prevention of discrimination. The 2021 Brazilian Strategy for Artificial Intelligence (EBIA) highlights core values like human

	rights, equality, and non-discrimination. Similarly, the proposed Bill No. 21/2020, which aims to regulate AI, reinforces these foundations by emphasizing respect for human rights, diversity, and equality.
Chile	Notable progress is being made in integrating fairness into its AI governance. The National AI Policy and a proposed AI bill, developed in line with UNESCO's guidelines, outline ethical principles centered on diversity, equity, and non-discrimination. These frameworks call for AI systems that ensure equal access, support cultural diversity, and prevent discriminatory outcomes and selection biases. Projects like "Algoritmos Éticos, Responsables y Transparentes21" in Chile work to integrate fairness, non-discrimination, and bias mitigation into public-sector AI systems. These initiatives provide tools for detecting gender bias and ensuring equitable public service delivery using AI. The Chile's fAIr Venture methodology22, developed with the Ministry of Science, aims to assess the ethical risks and social impacts of AI technologies, including gender bias, in investment decisions.
Costa Rica	The National strategy (ENIA) prioritizes ethical principles such as human dignity, transparency, and fairness, with the goal of promoting social welfare and reducing inequalities through AI
El Salvador	While the recently passed legislation focuses on promoting AI development, explicit provisions addressing fairness and non-discrimination are not prominently detailed
Mexico	Mexico lacks a comprehensive national strategy or policy on AI, and explicit integration of fairness principles remains a work in progress.
Honduras	Honduras is in the early stages of AI development, with no specific regulatory framework governing its use.
Indicator: Prevent Bias and ensure AI does Not Reinforce Inequalities.	
Sub indicator: Income Inequality	
Artificial intelligence is transforming middle-class jobs. Can it also help the poor?23	66% of employers globally prioritize AI skills over experience. 7–14% of LAC workers can benefit from GenAI tasks. 17 million jobs in LAC are GenAI-relevant but lack digital tools. 5.6x more likely: richest vs. poorest in Mexico to hold GenAI-exposed jobs with computer access. 1–6% of LAC jobs are at high risk of automation due to GenAI.

[21] https://goblab.uai.cl/en/ethical-algorithms/
[22] https://indicelatam.cl/ethical-algorithms-chiles-commitment-to-fair-and-transparent-ai/

[23] López-Calva, L. F., Rodríguez Castelán, C., & Winkler, H. (2025, January 28). Artificial intelligence is transforming middle-class jobs. Can it also help the poor? Brookings.

Indicator: Global Benchmark	
The HAI AI Index 2024 Annual Report	Fairness 212 fairness-related academic papers submitted in 2023 (25.4% increase over 2022). Industry adoption: Global average of 1.97 out of 5 fairness measures implemented. 29% of surveyed organizations identify fairness as a key risk. Non-discrimination Identified in fairness definitions (e.g., group and individual fairness). Notable disparities in AI outcomes in healthcare and hiring systems were cited.
MAIN FINDINGS	
Advancing fairness and inclusion in AI requires not only principled commitments but also legal, institutional, and infrastructural changes that are locally grounded and regionally coordinated. **Uneven Integration of Fairness Principles** Countries like Brazil, Chile, and Costa Rica have begun embedding fairness and non-discrimination into their AI policies and strategies. In contrast, El Salvador, Mexico, and Honduras are still in early stages of developing frameworks that explicitly address these issues, resulting in fragmented regional approaches to AI fairness. **The Territorial Principle Undermine Regulatory Enforcement** The **Territorial Principle** limits the jurisdiction of Latin American regulators over foreign tech firms without legal presence in the region. Except for Brazil, most countries lack local offices of major AI providers, severely constraining their ability to enforce accountability for algorithmic bias and discriminatory practices. **Weak Enforcement Capacity** Even where legal principles exist, institutional capacity to monitor, audit, and enforce fairness standards is limited. Regulatory frameworks lack the tools and authority needed to intervene effectively in cases of AI-related discrimination or exclusion. **Bias in AI Training Data** AI systems often reflect **non-local or foreign data biases**, leading to underrepresentation of Latin American populations and cultural contexts. This increases the risk of **algorithmic discrimination**, particularly against marginalized groups, including Indigenous communities, Afro-descendants, and rural populations. **Digital Exclusion Intensifies Inequities** Structural inequalities—such as limited internet access, lack of digital skills, and gender disparities—reduce participation of vulnerable groups in AI development and oversight. Without active measures to ensure inclusion, AI systems risk reinforcing historical patterns of exclusion.	

Urgent Need for Context-Specific Regulation Effective inclusion requires **policy frameworks tailored to local realities**, including socio-demographic diversity, linguistic plurality, and regional development gaps. A one-size-fits-all approach to fairness will fail to address Latin America's unique equity challenges. **Regional Coordination Could Enhance Fairness** Cross-border cooperation on standards and enforcement could help smaller countries overcome limitations in negotiating power and technical expertise.

5.4 Gender Equality

TABLE 20. PRINCIPLE OF GENDER EQUALITY

Indicator: Gender-Sensitive AI Policies and Tools.	
Country/ Source	Description
ILIA Report 2024 Regional status	**Gender disparities persist in both engineering and AI literacy:** women make up 27% of AI engineers and just 22% in AI literacy roles. **Persistent Gender Gaps in AI Talent** Female representation in AI engineering roles remains low across Latin America. In 2023: Uruguay had the highest percentage of women in AI engineering (24.97%), while Chile had the lowest (17.18%). These gaps are even wider in AI literacy competencies, where Chile again ranked lowest (7.6%) and Mexico the highest (25.19%). There is a broader trend of underrepresentation of women in AI research, with an average participation rate of around 19.8% across the region. **Widening Gaps in AI Literacy** Gender disparities are even more pronounced in foundational skills, with only 22% of AI literacy competencies being held by women compared to 27% in engineering roles. The report stresses the need to prioritize digital education and STEM pathways for girls and women, as improving these entry-level skills is foundational to long-term equity in the AI workforce.
OAS Inter-American Model Law to Prevent, Sanction and Eradicate Digital Violence Against Women on the Basis of Gender24	This law aims to close legal gaps around technology-facilitated gender violence by placing victims at the center and establishing shared responsibilities among states, tech companies, and civil society to create safer digital environments for women. **Guaranteed rights**: Recognizes women's right to a life free from digital violence.

[24] Organization of American States (OAS) – Draft**. *Inter-American Model Law to Prevent, Sanction, and Eradicate Digital Violence Against Women on the Basis of Gender.*** Preliminary version, March 6, 2023. Washington, D.C.

	Defines Forms of digital violence: Non-consensual sharing of intimate content (including deepfakes), Online harassment, identity theft, and defamation. Gendered disinformation and hate speech.Use of AI and algorithms to amplify or enable discriminatory content. Coordinated attacks on women in public or political roles. **Judicial processes with a gender lens**: Ensure fair and stereotype-free investigations and trials.
Declaration of the Ibero-American Data Protection Network (RIPD) Against Digital Violence Towards Women and Girls25	This declaration by the Red Iberoamericana de Protección de Datos (RIPD) addresses the urgent need to combat digital violence against women and girls in Ibero-America. It highlights the increasing use of digital technologies (internet, mobile devices, social media) to perpetuate violence, such as harassment, threats, extortion, deepfakes, and non-consensual dissemination of intimate content. **Digital violence as a rights violation** Online environments reproduce and amplify structural gender-based violence. Digital violence is recognized as a violation of the fundamental right to data protection, given that personal data (images, voice, videos) are misused without consent. **Disproportionate impact on women and girls** Women, especially girls and adolescents, are disproportionately affected due to historical hypersexualization and embedded gender stereotypes. Digital violence causes severe physical, psychological, and economic harm. **International legal and policy foundations** Refers to international frameworks like the UN Declaration on Scientific Progress (1975), the Istanbul Convention (2011), the Belém do Pará Convention (1994), and the 2030 Agenda (SDG 5). Emphasizes the need for ethical AI and data practices to prevent the algorithmic reproduction of violence and discrimination.
State of Legislation on Digital Gender-Based Violence in Latin America Report26	This report provides a comprehensive analysis of the current legal frameworks addressing digital gender-based violence across 19 Latin American countries. It was developed as part of a collaboration between EUROsociAL+, the Mexican National Institute for Transparency and Access to Information, and the Gender Equality Policies Area of Expertise France. The goal is twofold: map existing legislation and support coordinated legal reforms to address digital violence against women and girls.
Brazil	Lacks a specific digital gender violence law.

[25] Ibero-American Data Protection Network (RIPD). ***Declaration of the Ibero-American Data Protection Network Against Digital Violence Towards Women and Girls.*** Cartagena de Indias, March 4, 2021.

[26] Cortés Víquez, A. K., & Matus Arenas, J. (2021). ***Estado de la legislación en materia de violencia de género digital en Latinoamérica***. Programa EUROsociAL+, N° 103. Expertise France, Área de Políticas de Igualdad de Género. ISBN: 978-84-09-41490-1. Madrid, España.

	Applies civil and penal codes; has legislation on deepfakes and stalking (Law 14.132/2021); includes liability for internet providers under its Internet Civil Framework.
Chile	Lacks a specific digital gender violence law. Penal code covers privacy violations; pending legislation aims to criminalize non-consensual image dissemination and hold platform administrators accountable.
Costa Rica	Lacks a specific digital gender violence law.
El Salvador	Lacks a specific digital gender violence law. Specific cybercrime laws address identity theft, non-consensual data sharing, and cyberharassment. Significant gender disparities exist in digital access, impacting approximately 40% of women who lack affordable internet access
Ley Olimpia/ Mexico[27]	**Ley Olimpia:** This law criminalizes violations of sexual privacy and define digital violence as a modality of gender violence. **Digital Education**: Strong commitment to digital government and AI integration in public administration; also leads in affordability and access. **Access & Devices**: High device score of 62.43, reflecting widespread availability of computers and smartphones. Over 60% of homes have computers. **Digital Gap**: Still challenged by socio-economic inequality, particularly in indigenous and rural populations, despite national-level progress.
Honduras	Penal code criminalizes the dissemination of intimate content and includes aggravated penalties for sextortion.
Indicator: AI must promote gender equity and avoid reinforcing stereotypes.	
Sub indicator: Labor Gender Gap	
Country/ Initiative	Description
2024 Work Trend Index Annual Report (Microsoft & LinkedIn)[28]	Global patterns show underrepresentation of women in early access to AI training and power-user categories.

[27] https://www.gob.mx/profeco/es/articulos/la-ley-olimpia-y-el-combate-a-la-violencia-digital?idiom=es
[28] https://news.microsoft.com/annual-wti-2024/

	This suggests that without targeted gender-inclusive policies, the current AI wave could replicate or deepen pre-existing gender gaps in the labor market, particularly in STEM-related fields.
AI and the Increase of Productivity and Labor Inequality in Latin America (IDB, 2024)29	Women show higher average exposure to LLMs than men, both in direct and indirect use scenarios due occupational segregation. Women are overrepresented in roles such as administrative support and services, which are more exposed to automation and AI augmentation.
IMF – Gen-AI: Artificial Intelligence and the Future of Work30 (2024)	Women at higher risk of Human Labor substitution: Women are overrepresented in jobs at medium levels of exposure to AI, they are underrepresented in high-complementarity roles, where AI complements rather than substitutes human labor.
Sub Indicator: Automation-Exposed Jobs	
Source	Metrics
International Labor Organization & World Bank Working Paper 121 (2024)31	Women are twice as likely as men to hold jobs exposed to automation. Brazil Female: 3.8% Male: 1.4% Chile Female: 4.8% Male:1.7% Costa Rica Female: 8.3% Male: 3.4% El Salvador Female: 4.9% Male: 2.7% Mexico Female: 3.9% Male: 1.4% Honduras Female: 3.3%

[29] https://publications.iadb.org/en/ai-and-increase-productivity-and-labor-inequality-latin-america-potential-impact-large-language

[30] https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2024/01/14/Gen-AI-Artificial-Intelligence-and-the-Future-of-Work-542379

[31] Gmyrek, P., Winkler, H., & Garganta, S. (2024). *Buffer or Bottleneck? Employment Exposure to Generative AI and the Digital Divide in Latin America* (ILO Working Paper No. 121). International Labour Organization and The World Bank. https://doi.org/10.54394/TFZY7681

<table>
<tr><td></td><td>Male: 1.4%</td></tr>
<tr><td colspan="2">Sub Indicator: Augmentation-Exposed Jobs</td></tr>
<tr><td>International Labor Organization
& World Bank Working Paper 121 (2024)</td><td>Augmentation exposure is more gender-balanced, but women in exposed jobs often lack access to enabling digital infrastructure, impeding their ability to benefit from AI.

Brazil
Female: 13.4%
Male: 12.9%

Chile
Female: 14.4%
Male:12.6%

Costa Rica
Female: 14.4%
Male: 13.6%

El Salvador
Female: 15.7%
Male: 10.6%

Mexico
Female: 18%
Male: 11.9%

Honduras
Female: 3.3%
Male: 1.4%</td></tr>
<tr><td colspan="2">Sub Indicator Native Models</td></tr>
<tr><td>Model</td><td>Performance</td></tr>
<tr><td>LatamGPT Initiative
(Regional/ led by Chile)</td><td>While the initiative emphasizes inclusivity and regional representation, specific strategies or measures addressing gender equality within the project's framework have not been explicitly detailed</td></tr>
<tr><td>TeenyTinyLlama</td><td>Ethical AI:
The project is supported by RAIES (Rede de Inteligência Artificial Ética e Segura), indicating an alignment with responsible and fair AI practices in the Latin American context.
The TeenyTinyLlama (TTL) models, developed for Brazilian Portuguese text generation, do not incorporate targeted strategies to promote gender equality or reduce gender bias. The creators recognize that, like other language models trained on extensive textual corpora, TTL may reproduce historical and societal stereotypes embedded in the data. As a result, the model’s outputs can reflect these biases, potentially generating harmful or discriminatory content. That is why the model is for research-only purposes.</td></tr>
<tr><td colspan="2">Indicator: Support equal representation and participation across genders in AI development.</td></tr>
</table>

The development of native AI models in the region remains incipient and limited. Beyond initiatives like LatamGPT and TeenyTinyLlama, there is no guarantee that a gender equity approach is being integrated into the teams or the development processes of these technologies.	
Indicator: Global Benchmark	
The HAI AI Index 2024 Annual Report	The report does not provide disaggregated metrics or dedicated analysis on gender equality or gender gaps in AI but it does state that women remain underrepresented in informatics and AI fields. As reference: Female bachelor's graduates: France (14.8%), UK (17.8%), Germany (21.5%).
MAIN FINDINGS	

Addressing gender inequality in AI requires intersectional strategies that also consider race, class, and geographic disparities to ensure equitable outcomes across diverse populations.

Persistent Structural Gaps
Latin America faces entrenched gender disparities in STEM and AI-related fields, limiting women's participation in both the development and use of AI technologies.

Vulnerability to Automation
Women are disproportionately at risk from AI-driven automation, particularly in clerical, administrative, and service jobs—occupations where they are overrepresented.

Limited Representation in AI Development
Despite the emergence of regional AI models (e.g., LatamGPT, TeenyTinyLlama), women's participation in their development remains minimal due to systemic exclusion and lack of targeted support.

Access and Infrastructure Divide
Even in areas where GenAI presents augmentation opportunities, women often lack access to the necessary digital infrastructure and training, limiting their ability to benefit equitably from AI.

Gaps in Legal Protection
Mexico stands out for its gender-sensitive digital regulation (e.g., Olimpia Law), but most Latin American countries lack comprehensive laws addressing online gender-based violence.

Absence of Gender-Specific Metrics
Current regional and global AI monitoring reports fail to include disaggregated gender data, making it difficult to design targeted interventions or assess progress.

Insufficient Policy Coordination
A gender perspective is rarely mainstreamed into national AI strategies or innovation ecosystems, highlighting the need for coordinated policy reforms.

Unequal Workforce Integration
Women remain underrepresented in AI-related professions, with few institutional mechanisms in place to support gender equity in hiring, leadership, and advancement.

Need for Inclusive Capacity Building

Without deliberate investment in gender-inclusive digital literacy and AI education, existing disparities risk deepening, further marginalizing women from future AI-driven economies.

5.5 Accessibility & Inclusiveness

TABLE 21. PRINCIPLES OF ACCESSIBILITY AND INCLUSIVENESS

<table>
<tr><td colspan="2">Indicator: Guarantee access to AI tools</td></tr>
<tr><td colspan="2">The development of native AI models in the region remains incipient and limited. Beyond initiatives like LatamGPT and TeenyTinyLlama, there is no guarantee that a gender equity approach is being integrated into the teams or the development processes of these technologies.</td></tr>
<tr><td>Country/ Initiative</td><td>Description</td></tr>
<tr><td>ILIA Report 2024
REGIONAL STATUS</td><td>Access to artificial intelligence (AI) tools and ecosystems in Latin America is highly uneven and faces multiple structural barriers. The document highlights several key points regarding accessibility:

Foundational Gaps in Infrastructure and Talent
Most Latin American countries lack robust infrastructure for data processing, cloud services, and high-performance computing.
There is widespread inequity in digital connectivity, with rural areas particularly underserved. Although 93% of the population can access mobile networks, quality and speed vary significantly.

Smartphone affordability is still a major barrier, with low regional scores (avg. 32.68/100), limiting access to mobile AI tools.
The region remains largely dependent on foreign AI capabilities, as no country has sovereign capacity to develop large-scale AI models.

Human Capital Constraints
The availability of AI-trained professionals has doubled in 8 years but still falls far short of global benchmarks.
A major issue is brain drain: with few exceptions (Costa Rica), more AI talent is lost than retained.

Gender disparities persist in both engineering and AI literacy: women make up 27% of AI engineers and just 22% in AI literacy roles.

The digital literacy gap is narrower than the technical skills gap, offering a window of opportunity to foster broader access through education and basic training.
The report urges a focus on foundational skills (critical thinking, STEM vocations, computational thinking) as the real entry point to meaningful AI access.

Country-Level Disparities
Only Chile, Uruguay, and Brazil consistently perform above average in infrastructure, talent, and data readiness.
The rest of the region is classified as adopters (moderate progress, e.g., Mexico, Argentina) or explorers (early-stage, e.g., Bolivia, El Salvador, Honduras).</td></tr>
</table>

	Many countries are still stuck in **3G infrastructure**, with very low 5G rollout (regional score under 9.34/100), which limits access to modern AI applications. Several countries have announced national AI strategies, but few have backed them with coordinated investment or regulatory frameworks. **Governance weaknesses** hinder scalability and equitable access, particularly where enabling conditions (infrastructure, education, cloud access) are weak.
ILO Labour Overview for Latin America and the Caribbean (2024 Executive Summary**)**[32]	Persistence Gender & Generational gaps linked to lack of digital skills and formal training hinders their social mobility and labour market integration.
Indicator: Digital Inclusion	
Country/ Initiative	Description
AI and the Increase of Productivity and Labor Inequality in Latin America (IDB, 2024)	The unequal distribution of digital infrastructure and technological integration across formal vs. informal sectors, and urban vs. rural areas, hampers equitable access to AI tools. Countries with lower digital penetration and skills show reduced effective exposure to LLMs, even if the theoretical potential exists.
IMF – Gen-AI: Artificial Intelligence and the Future of Work (2024)	Occupations that are highly exposed to AI and lack the contextual, ethical, or interpersonal complexity that would make AI a supportive tool rather than a substitute. In these roles, AI systems can perform core tasks autonomously and more efficiently than humans, leading to a high risk of job displacement. Characteristics of Low-Complementarity Jobs High exposure to AI: These roles involve tasks that overlap significantly with current AI capabilities, particularly pattern recognition, data processing, and scripted interactions. Low need for human oversight: Tasks are standardized and repetitive, with limited need for discretion, empathy, or complex social interaction. Minimal shielding: The social, ethical, or physical contexts do not prevent substitution by AI. For example, there's little societal resistance to automating outbound sales calls.
ILIA Report 2024 REGIONAL STATUS	**Digital inclusion**, particularly for education, remains uneven and deeply tied to income, geography, and public investment.

[32] **International Labour Organization (ILO).** *2024 Labour Overview: Latin America and the Caribbean – Executive Summary.* ILO Regional Office for Latin America and the Caribbean, Lima, Peru. Available at: https://www.ilo.org/americas

	Brazil **Digital Education**: Brazil leads the region in digital government implementation and has integrated ICT in public services. It scores highest in the region on digital government indicators. **Access & Devices**: 57.49 (on a scale to 100) in the “Devices” index, reflecting moderate access to digital tools like computers and smartphones. **Digital Gap**: While infrastructure is relatively advanced, rural and underserved areas continue to face connectivity and equipment access challenges, impacting equitable digital learning opportunities. **Chile** **Digital Education**: Strong government investment in digital public services and ICT-based education. Initiatives like “Algoritmos Éticos” aim to responsibly implement AI in the public sector. **Access & Devices**: High score of 58.98 for household computer access, with 60.15% of homes equipped—well above the regional average. **Digital Gap**: Despite infrastructure strength, inclusion of older adults and remote regions in digital literacy remains a challenge. **Costa Rica** **Digital Education**: National strategies (e.g., ENIA) aim to bridge digital divides through AI and infrastructure initiatives. The partnership between INA and Ericsson promotes digital skills through training. **Access & Devices**: Moderate device access with a 31.64 score; more than 30% of homes have a computer. **Digital Gap**: Digital inclusion is limited by affordability and lower rural connectivity; targeted programs are expanding to address this. **El Salvador** **Digital Education**: Efforts such as "Conectando El Salvador" and bootcamps for youth promote digital literacy and infrastructure expansion. **Access & Devices**: Very low device score of 26.81; household access to computers and smart devices is severely limited. **Digital Gap**: Wide digital divide, especially in rural and low-income areas, limiting the effectiveness of digital education. **Mexico** **Digital Education**: Strong commitment to digital government and AI integration in public administration; also leads in affordability and access. **Access & Devices**: High device score of 62.43, reflecting widespread availability of computers and smartphones. Over 60% of homes have computers. **Digital Gap**: Still challenged by socio-economic inequality, particularly in indigenous and rural populations, despite national-level progress. **Honduras** **Digital Education**: Supported by initiatives like UNICEF’s “Tinkering with Tech” and a national digital agenda. **Access & Devices**: Low score of 26.17, reflecting limited access to essential digital tools. **Digital Gap**: One of the most pronounced in the region, with minimal infrastructure in rural areas and scarce access to quality educational technology.

International Labor Organization & World Bank Working Paper (2024)	Access to computers at work is a key constraint. In Mexico over 60% of workers in augmentation-exposed roles do not use computers, blocking AI productivity gains. This digital gap widens inequality between and within countries.
UN Digital Development Observatory[33]	**Digital Inequality based on Income:**There is a **significant disparity in internet access** between income quintiles in Latin America and the Caribbean. Low-income households (Q1) consistently lag behind high-income households (Q5) in internet connectivity. This gap has persisted despite overall improvements in internet penetration across the region **Urban-rural divide**: Urban households had **74.8%** access, rural only **35.8%**—with some countries below **20%** in rural coverage.
Brazil	**Digital Inclusion Efforts**: Brazil has initiated several programs to enhance digital inclusion. Initiatives like **Ação Cidadania Digital**[34] to improve education quality and digital literacy among student
Chile	**High Internet Connectivity vs. Digital Skills**: Chile boasts one of the highest internet connectivity rates in Latin America at 93%. However, there is a significant gap in digital literacy, especially among older adults. While 88% of households with seniors have internet access, only 42% of seniors actively use digital tools, indicating challenges in digital skills and confidence.
Costa Rica	Despite having high digital coverage, there are still structural gaps between urban and rural areas[35]. **Digital Education**: National strategies (e.g., ENIA) aim to bridge digital divides through AI and infrastructure initiatives. The partnership between INA and Ericsson promotes digital skills through training. **Access & Devices**: Moderate device access with a 31.64 score; more than 30% of homes have a computer. **Digital Gap**: Digital inclusion is limited by affordability and lower rural connectivity; targeted programs are expanding to address this.
El Salvador	**Digital Education**: Efforts such as "Conectando El Salvador" and bootcamps for youth promote digital literacy and infrastructure expansion. **Access & Devices**[36]: Very low device score of 26.81; household access to computers and smart devices is severely limited.

[33] https://desarrollodigital.cepal.org/en/indicators
[34] https://wsa-global.org/2024/07/17/hacking-the-gap-brazils-path-to-digital-inclusion/
[35] https://globalconnectivityfund.com/closing-the-internet-gap-in-rural-costa-rica/
[36] https://datareportal.com/reports/digital-2024-el-salvador

	Digital Gap: Wide digital divide, especially in rural and low-income areas, limiting the effectiveness of digital education.
Mexico	**Digital Education**: Strong commitment to digital government and AI integration in public administration; also leads in affordability and access. **Access & Devices**: High device score of 62.43, reflecting widespread availability of computers and smartphones. Over 60% of homes have computers. **Digital Gap**: Still challenged by socio-economic inequality, particularly in indigenous and rural populations, despite national-level progress.
Honduras	**Digital Education**: Supported by initiatives like UNICEF's "Tinkering with Tech" and a national digital agenda. **Access & Devices**: Low score of 26.17, reflecting limited access to essential digital tools. **Digital Gap**: One of the most pronounced in the region, with minimal infrastructure in rural areas and scarce access to quality educational technology.
Indicator: Accessible to all including people with disabilities	
ILIA 2024 REPORT	**ILIA 2024 does not directly or systematically incorporate accessibility or disability-related variables** in its methodology, analysis, or key findings. There are no identified indicators, sub-indicators, or explicit analyses related to: • Public AI policies focused on people with disabilities • Digital or technological accessibility as an evaluated criterion • Inclusion of people with disabilities in talent or digital literacy data • Universal design or accessible AI practices This represents a significant omission in terms of inclusion and technological equity
UNESCO & Ibero-American Intergovernmental Network for Cooperation in the Education of Persons with Special Educational Needs (RIINE)[37]	***Developing Inclusive Educational Systems Porgram*[38]*:*** Eight Latin American countries and Spain's Ministry of Education have launched a regional call to support **inclusive education for students with disabilities**, under the initiative of RIINEE and UNESCO. The program will select **six projects** that demonstrate innovative practices using **assistive technologies, artificial intelligence, and accessible materials** to enhance learning in inclusive environments. The initiative targets educational institutions from the 19 RIINEE member countries, requiring at least one year of project implementation. It invites applications in three categories:

[37] https://www.educacionfpydeportes.gob.es/contenidos/ba/actividad-internacional/cooperacion-educativa/riinee/inicio.html

[38] https://www.unesco.org/en/articles/latin-american-countries-and-spanish-ministry-education-launch-call-promote-inclusion-students

	1. **Technological innovation for inclusion** 2. **Innovation in inclusive education** 3. **Use of AI in the classroom** The effort aims to reduce educational barriers, improve equity, and recognize impactful models across the region.
Brazil	**Lacks comprehensive public AI policies** focused on people with disabilities ***S***tatute of Persons with Disabilities (2015): Also known as the Brazilian Law for the Inclusion of Persons with Disabilities
Chile	**Lacks comprehensive public AI policies** focused on people with disabilities ***Law No. 20.422 (2010)*****:** This law establishes norms on equal opportunities and social inclusion for persons with disabilities, prohibiting discrimination
Costa Rica	**Lacks comprehensive public AI policies** focused on people with disabilities ***Equal Opportunities Law for People with Disabilities (Law No. 7600, 1996)*****:** This law prohibits discrimination based on disability and mandates accessibility in public spaces and transportation.
El Salvador	**Lacks comprehensive public AI policies** focused on people with disabilities ***Special Law on the Inclusion of Persons with Disabilities (2020)*****:** Approved by Legislative Decree No. 672, this law aims to promote the inclusion of persons with disabilities in various sectors.
Mexico	**Lacks comprehensive public AI policies** focused on people with disabilities ***General Law for the Inclusion of People with Disabilities (2011)*****:** This law recognizes the human rights of persons with disabilities and establishes public policies for their inclusion. ***CRPD Ratification (2007)*****:** Mexico ratified the Convention on the Rights of Persons with Disabilities, committing to uphold and implement the rights recognized in the convention.
Honduras	**Lacks comprehensive public AI policies** focused on people with disabilities ***Legal Framework***: Honduras recognizes persons with disabilities as full holders of rights inherent in human dignity, as established in the Constitution and international human rights conventions.
Indicator: Global Benchmark	
The AI Index 2024 Annual Report	Systemic disparities in both participation and access across educational levels and geographies. These disparities are likely to impact who gets to participate in, benefit from, and shape the future of AI systems. Accessibility Limited coverage; discussed indirectly via disparities in participation and digital divides. Hispanic grads still underrepresented. Inclusiveness AI fairness and bias remain unevenly addressed across regions.

	Latin America averaged 1.90 implemented fairness measures, lower than Europe (1.94). Faculty Demographics in Higher Education reflects inequalities in access: • In 2022, 57.3% of faculty in CS, CE, and IT were white, and 30.1% were Asian. • Black or African American (2.5%) and Hispanic (3%) groups remain significantly underrepresented.

MAIN FINDINGS

AI Risks Reinforcing Structural Inequalities
Poorly designed or non-inclusive AI systems may amplify existing barriers through inaccessibility, algorithmic bias, and labor exclusion.

Digital and Geographic Gaps Persist
There are significant structural disparities in access to digital infrastructure and AI technologies between rural and urban populations in Latin America.

Educational Inequalities Shape Participation in AI
Systemic gaps in education and digital literacy determine who can access, influence, or benefit from AI. These disparities are especially pronounced across regions, income groups, and gender lines.

Exclusion of Vulnerable Populations
Women, rural populations, low-income communities, informal workers, and older adults remain marginalized in AI adoption and digital skill acquisition.

AI Could Exacerbate Labor Market Inequities
Without targeted interventions, AI—particularly generative AI—could deepen employment divides by favoring high-skilled, urban, and digitally literate workers, leaving others behind.

Women's Participation Tied to Education and Training Access
Access to quality education and digital capacity building is directly linked to women's ability to engage in and benefit from digital transformation.

People with Disabilities Are Overlooked in AI Policy and Design
Latin America lacks comprehensive AI strategies that incorporate accessibility features such as assistive technologies, universal design principles, or inclusive datasets.

Legal and Ethical Gaps for Inclusion
There are no enforceable frameworks in the region ensuring that AI systems address the rights and needs of people with disabilities. This places the burden of inclusion largely on developers and deploying institutions.

Risk of Technological Concentration and Increase in Inequalities.
If current trends continue, generative AI and other advanced technologies may serve as productivity tools only for a select group, while reinforcing structural exclusion for the majority.

Inclusive and Accessible AI Governance is require:
The current landscape underscores the urgent need for people-centered public policies, inclusive data practices, and stronger regulatory frameworks to ensure that AI serves all, not just the digitally privileged.

5.6 Sustainability

TABLE 22. PRINCIPLE OF SUSTAINABILITY

Indicator: Align AI Development with Environmental Protection and Sustainability.	
Country/ Initiative	Description
ILIA 2024 REPORT	Sustainability in AI is defined as adopting practices that minimize environmental impact and optimize resource use, especially energy. Emphasis is placed on energy efficiency, given AI's potentially high energy demands depending on the type of model and system architecture. Sustainability is framed as a balance between technological innovation and environmental responsibility to ensure access to clean and affordable energy for future generations. Integration in National Strategies The report shows that while many Latin American countries are integrating ethical considerations into AI strategies, sustainability is often indirectly addressed, primarily through broader ethical and governance frameworks rather than as a dedicated priority. Countries like Brazil and Chile are highlighted for having national strategies that mention sustainability concerns within the "Ethics and Governance" dimensions. Evaluation Metrics The "Ethics & Sustainability" subdimension is introduced in the governance dimension of the ILIA index. It includes indicators from global indices (e.g., GIRAI, Network Readiness Index) and highlights whether national AI policies consider environmental and social justice criteria. Scores for countries like Chile, Brazil, Costa Rica, and Mexico suggest varying levels of inclusion of sustainability practices in their AI governance structures.
AI Contribute to sustainable development goals (SDGs)	
CAF (2024). **AI and the SDGs in Latin America and the Caribbean**[39].	SDG 3: Good Health and Well-being AI Contributions: Early Diagnosis & Prevention: Tools like retinopathy detectors in Mexico and telemedicine systems in El Salvador improve access to early diagnostics. Health System Efficiency: Uruguay's interoperable electronic health records streamline clinical workflows; Chile's Examedi integrates GPT-4 to democratize access. Training & Human Capital: AI applications support medical education and decision-making, while also helping reduce repetitive tasks through automation. AI models trained on limited or biased data can provide inaccurate or misleading outputs, especially in health diagnostics (e.g., retinopathy tools in Mexico and Chile).

[39] CAF (2024). ***AI and the SDGs in Latin America and the Caribbean***. Development Bank of Latin America and the Caribbean.

Importance of aligning with UNESCO's ethics recommendations.
Need for data protection and impact assessments.

SDG 5: Gender Equality
AI Contributions:
Algorithmic Justice: Feminist AI initiatives (e.g., AymurAI, SofIA) are designing systems sensitive to gender and intersectional biases.
Empowerment Tools: Platforms like La Independiente provide women and LGBTQ+ workers with resources and networks.

Feminist AI initiatives like AymurAI and SOF+AI face a significant challenge in moving from prototyping to implementation due to lack of sustained funding beyond early stages

while gender-focused initiatives exist, broader AI strategies still lack consistent integration of intersectional lenses, including race, ethnicity, and LGBTQ+ identities

SDG 9: Industry, Innovation and Infrastructure
AI Contributions:
Industrial Transformation: Agrintel in the Dominican Republic applies AI in agriculture, enabling predictive analytics and boosting productivity.
Partnerships (e.g., GENIA + RELACI) promote skill development and private sector innovation.
Inclusion: Tools like Microsoft's ***Seeing AI*** promote accessibility for persons with disabilities.
Needs:
Broader adoption in LAC.
Infrastructure and digital literacy gaps must be addressed for full-scale deployment.

SDG 12: Responsible Consumption and Production
AI Contributions:
Optimization: AI enables efficient resource use in industries and supports the circular economy model in tourism.
AI-informed travel cycle management reduces environmental impact through smarter planning and real-time data use.

SDG 16: Peace, Justice and Strong Institutions
AI Contributions:
Efficient Justice: PROMETEA in Argentina cuts legal processing times, promoting equitable access to justice.

Participatory Governance: Tools like CiudadanIA and Taína enhance citizen engagement and streamline government services.

Inclusivity: AI solutions with multilingual and culturally adapted interfaces (e.g., Taína in Dominican Republic) increase service accessibility.
Risks:
Risk of automating exclusion or reinforcing bias without human oversight.
Strong need for citizen participation in AI governance design.

SDG 17: Partnerships for the Goals

	AI Contributions: Regional Strategies: LATAM 4.0 fosters collaboration between countries like Honduras and the Dominican Republic, with GENIA and ALIA playing coordinating roles. South-South Cooperation: Joint declarations (Santiago, Montevideo) formalize regional AI ethics frameworks. Global Influence: Participation in the G20 and UN forums strengthens LAC's collective voice in international AI governance.
Indicator: AI innovations that minimize environmental harm	
Initiatives	Environmental implication
The Role of Artificial Intelligence in Latin American Ruminant Production Systems[40]	AI can enhance ruminant production through: Precision nutrition and feeding programs. Reproductive cycle monitoring and health surveillance. Environmental monitoring and resource optimization. Predictive models for productivity and decision support. Applications are underway in Brazil, Mexico, Argentina, Chile, Colombia, and Uruguay, with tools like MooCare, expert systems, automated milking, and neural network models for disease and weight forecasting. Barriers to adoption include: • Digital divide and poor infrastructure (e.g., limited 5G and internet coverage). • High costs and limited scalability for smallholders. • AI complexity, skills shortages, and lack of technical training. • Data dependency, vulnerability to disruption, and ethical concerns. • Technological displacement risks and lack of inclusive labor transition plans. • Inadequate regulatory frameworks, leaving legal gaps on IP, liability, and ethics. Expand access, training, and tailored solutions for small-scale farmers. Promote ethical AI with attention to sustainability, labor, and biodiversity. Latin America accounts for: • 23% of global beef cattle and 24% of dairy cattle. • 30% of global meat and 28% of bovine milk production. • 46% of regional agricultural GDP from ruminant sectors. AI adoption constraints: • Only 2.7% of global AI research output originates from Latin America. • Latin American AI workforce representation: 2.16% vs. 3.59% globally. • 67% of Brazilian farmers cite tech costs as the main challenge. • 58% of Latin American companies had invested in AI by 2020.

[40] Vargas-Bello-Pérez, E., Espinoza-Sandoval, O. R., Gonzalez Ronquillo, M., Angeles Hernandez, J. C., Chay-Canul, A. J., Lee-Rangel, H. A., Amaya, G. D., Keim, J. P., Baudracco, J., Vieira, R. A. M., & Ghavipanje, N. (2024). The role of artificial intelligence in Latin American ruminant production systems. ***Animal Frontiers, 14***(6), 24–32. https://doi.org/10.1093/af/vfae034

EDP Brazil[41]	EDP is a global energy Company in Brazil for over 20 years, we have been involved in the generation, transmission and distribution of energy. With a focus on renewable energy, we will be a 100% green company by 2030. • Is using AI to manage renewable energy and climate risks • Investing $5.8 billion in AI-based energy innovation by 2027
Indicator: Global Benchmark	
The AI Index 2024 Annual Report[42]	Energy consumption and carbon emissions from AI is a major and growing concern, but without complete transparency from Industry it is difficult to tackle. Carbon Emissions-Training Phase: OpenAI's GPT-3: 502 tonnes CO_2 equivalent. Meta's Llama 2 (70B): 291.2 tonnes CO_2e — 16× more than an average American's annual emissions. Emissions differ by model size, training hardware, and energy grid efficiency. Carbon Emissions-Inference Phase: Emissions from inference (i.e., model use) can surpass training when models are queried millions of times daily. Image generation tasks have significantly higher inference emissions than text classification tasks. Lack of Transparency: Major developers like OpenAI, Google, and Anthropic do not consistently report emissions data. Only Meta (Llama 2) reports emissions and claims carbon offsetting.
MAIN INSIGHTS	
AI Use Cases Enable Multi-Goal Synergies on SDGs: AI applications, particularly in health, contribute to multiple Sustainable Development Goals (e.g., SDG 3 - Health, SDG 9 - Innovation, SDG 5 - Gender Equality), highlighting their cross-cutting potential. Environmental Sustainability Remains Underaddressed: AI's growing energy and carbon footprint is a critical concern. Industry opacity regarding emissions data undermines mitigation efforts. Lack of an Intersectional Approach: Broader AI strategies inadequately integrate intersectional perspectives, especially on gender, class, and ethnicity. Bias Risks in High-Impact Sectors (Health or Justice) In healthcare, the potential for biased data and model outputs could reinforce inequality in access and outcomes.	

[41] https://brasil.edp.com/en
[42] https://aiindex.stanford.edu/report/

In the justice system, automation without human oversight may institutionalize exclusion and discrimination. Public Participation is Essential and mostly missing: Citizens must be meaningfully included in AI governance and processes to guarantee sustainable practices and initiatives.

5.7 Privacy & Data Protection

TABLE 23. PRINCIPLES OF PRIVACY & DATA PROTECTION

Indicator: Data Protection & Privacy Laws	
Regional Status (Based on ILIA)	Country Status
Latin American countries have progressively enacted data protection laws, drawing inspiration from international frameworks like the European Union's General Data Protection Regulation (GDPR). This movement underscores a regional commitment to safeguarding personal data and upholding individuals' privacy rights.	Brasil[43] : • Lei Geral de Proteção de Dados Pessoais (LGPD, 2020) • The Autoridade Nacional de Proteção de Dados (ANPD) is the national data protection authority responsible for enforcing the LGPD • Brazil's AI law, also known as the AI Regulatory Framework (Bill 2338/2023), was approved by the Senate in December 2024. It establishes guidelines for the use and development of AI in Brazil. • Extraterritorial reach/ Low Enforcement mechanisms Chile[44]: • Personal Data Protection Law (DPL) • It will take effect in December 2026 • Extraterritorial reach/Low Enforcement mechanisms Costa Rica[45]: • Ley de proteccion de Datos (Law No. 8968, 2011) • The law also established the Costa Rican data protection authority (PRODHAB) to enforce the law

[43] American Bar Association https://www.americanbar.org/groups/business_law/resources/business-law-today/2020-may/brazil-passes-landmark-privacy-law/#:~:text=Joining%20the%20global%20trend%20originating,personality%20of%20the%20natural%20person.%E2%80%9D

[44] The future of privacy. https://fpf.org/blog/chiles-new-data-protection-law-context-overview-and-key-takeaways/#:~:text=On%20August%2026%2C%202024%2C%20the,date%20(in%20December%202026.)

[45] Costa Rica, Ministerio de Ciencia, Innovación, Tecnología y Telecomunicaciones (MICITT). Estrategia de transformación Digital, Costa Rica 2023-2027. -San José, C.R.: MICITT, 2022. ISBN: 978-9968-732-89-5.

Low to very low enforcement capacity No Extraterritorial reach in most regulations	• No Extraterritorial Reach <u>El Salvador</u>[46]: • Ley de Seguridad de la informacion y Ciberseguridad (2024) • The State Cybersecurity Agency is responsible for enforcing data protection regulations • Human Rights Watch has raised concerns that the laws threaten media freedom and privacy rights. • No Extraterritorial reach <u>Honduras</u>[47]: • Honduras does not have a comprehensive data protection law, but it does have some laws and constitutional provisions that protect personal data. The Draft Law on the Protection of Personal Data has been stalled in Congress since 2018. • There is no general data protection regulator in Honduras[48] <u>Mexico:</u> • The General Law for the Protection of Personal Data in the Possession of Obliged Subjects applies to data held by public-sector entities • The Privacy Notice Guidelines state the rules for creating, using, and implementing a privacy notice • Limited extraterritorial reach
Indicator: Data Governance Frameworks	
In its Report *Data for Better Governance: Building Government Analytics Ecosystems in Latin America and the Caribbean* [49] (The World bank, 2024) indicates that governments in Latin America are well-positioned	Brazil: Robust Data Governance framework: • Digital Governance Strategy (EGD) • Presidential Decree 10,046 (2019) On data sharing and interoperability among public bodies.

[46] International Trade Administration: https://www.trade.gov/market-intelligence/el-salvador-ict-cybersecurity-and-information-security-law#:~:text=Additionally%2C%20the%20Legislature%20approved%20the,Publication%20:%20November%2015%2C%202024.

[47] DLP Piper:https://www.dlapiperdataprotection.com/index.html?t=law&c=HN

[48] https://www.dataguidance.com/jurisdictions/honduras

[49] Data for Better Governance: Building Building Government Analytics Ecosystems in Latin America and the Caribbean https://www.worldbank.org/en/region/lac/publication/data-for-better-governance-building-government-analytics-ecosystems-in-latin-america-and-the-caribbean

Rogger, Daniel; Schuster, Christian. 2024. Manual de Analítica Gubernamental: Aprovechar los datos para fortalecer la Administración Pública. © Washington, DC: World Bank. http://hdl.handle.net/10986/42471 License: CC BY-NC 3.0 IGO.

to expand the strategic use of administrative data but face challenges in capability, infrastructure, and systematic planning. Maximizing the value of government analytics requires enhancing data integration, building analytical capacity, and embedding analytics into decision-making at all levels of public administration. The report offers actionable insights to support these goals through policy recommendations tailored to governments' varying levels of maturity. Despite significant investments in digital Management Information Systems (MISs), data infrastructure in Latin America is fragmented and underutilized. Improving digitalization, interoperability, and data governance will enable governments to leverage existing data for more advanced analytics—moving beyond monitoring to diagnostic and predictive insights that can enhance policy outcomes and public sector performance.	Chile: Robust data governance framework that includes laws and a Personal Data Protection Agency (PDPA). The framework is based on the General Data Protection Regulation (GDPR) Costa Rica[50]: Despite having laws and strategies, the data governance landscape remains fragmented and poorly implemented: • Digital Governance Strategy (ETD, 2023) El Salvador: Currently lacks a comprehensive data governance framework specifically addressing data sharing and interoperability strategies Honduras[51] : Regulations or strategies focusing on data governance, sharing, and interoperability are not clearly outlined Mexico: Laws and Regulations for Data protection and Open Government. • Politica Nacional de Datos Abiertos[52] (2023) • Ley General de Transparencia y Acceso a la Información Pública (LGTAIP, 2015)
Indicator: Data Sharing & Access Data Ecosystem Classification based on ILIA (2024)	

[50] https://www.linkedin.com/pulse/cross-border-data-transfers-under-costa-rican-law-jha-arunima-cipp-e--ti0zf

[51] International Trade Administration/Honduras. https://www.trade.gov/country-commercial-guides/honduras-digital-econom

[52] Secretaria de la Funcion Publica. https://portal-transparencia.buengobierno.gob.mx/datos-abiertos/datos-abiertos-de-la-sfp/politica-nacional-de-datos-abiertos/

<table>
<tr>
<td colspan="2">Data availability and access in Latin America have seen significant advancements, yet challenges persist. Open data initiatives have been launched across the region, with countries like Mexico, Brazil, and Uruguay leading in data openness and quality. However, the sustainability of these initiatives is fragile, often lacking long-term policy integration, which affects data quality and availability.

The OECD's OURdata Index indicates that Latin American countries score an average of 0.41 in data availability, compared to the OECD average of 0.59.</td>
<td>Countries with Advanced Data Ecosystem: high data availability, data management capabilities, and
a robust governance framework:
• Brazil
• Chile
• Mexico

Countries with Developing Data Ecosystems: with resources and processes for data management and governance, although with limitations and without an enabling environment for the development
of AI:
• Costa Rica

Coutries with Emerging Data Ecosystems: significant barriers in the availability of data and limitations in the infrastructure necessary for their use and in governance frameworks:
• El Salvador
• Honduras

Countries with Interoperability Frameworks:
• Brazil:
Open Finance Initiative: Brazil's central bank has established a comprehensive regulatory framework for open finance, promoting standardized data exchange between financial institutions and the insurance and pension sectors. This initiative aims to enhance financial inclusion, competition, transparency, and financial education.

• Chile:
Financial Portability and Fintech Laws: Chile's Financial Portability Law (2020) and the subsequent Fintech Law (2022) include provisions for open finance. These laws empower regulators to authorize the use of APIs for secure consumer information exchange, advancing data interoperability in the financial sector.</td>
</tr>
<tr>
<td colspan="3">Indicator:Online Safety</td>
</tr>
<tr>
<td>Online safety</td>
<td>-Online violence against women is a critical issue, manifesting through harassment, threats, and non-consensual sharing of intimate content.

-In Latin America, online violence against women in politics is notably severe. Such violence not only silences women but also undermines</td>
<td>Brazil:
• law that classifies cyberbullying as a crime: Law No. 14,811, which incorporates article 146-A into the Penal Code.

Chile[54]:
There is a bill in Chile that seeks to criminalize and punish digital violence. The Chamber of Deputies approved it, and it is now before the Senate for consideration and voting.</td>
</tr>
</table>

[54] https://www.senado.cl/comunicaciones/noticias/violencia-digital-llega-al-senado-proyecto-que-propone-presidio-de-hasta

<table>
<tr>
<td></td>
<td>democratic processes by deterring female participation in public discourse

Online harassment and violence targeting women in Latin America are on the rise, with tangible consequences in the physical world. Women—particularly journalists—face attacks on platforms such as Twitter, revealing entrenched societal hostility based on a 2020 UNESCO Report[53].

Efforts to combat this include various initiatives aiming to protect women in politics and media from such online abuses</td>
<td>Costa Rica55:

• Law for the prevention of harassment of minors by electronic or virtual means (GROOMING) and reform of the Penal Code No. 10020

El Salvador:
Cybersecurity and Information Security Law (2024)
Personal Data Protection Law (2024)

Mexico:
• The Olimpia Law[56] and the General Law on Women's Access to a Life Free of Violence, which regulate digital violence

Honduras: No current Law</td>
</tr>
<tr>
<td colspan="3">Indicator: Global benchmark</td>
</tr>
<tr>
<td>The AI Index 2024 Annual Report[57]</td>
<td colspan="2">Privacy
2023 survey: Privacy is one of the top three concerns for companies adopting AI.
Privacy is among the most frequently searched keywords in responsible AI submissions.

Data Protection
Discussed under privacy and governance, with emphasis on risks like data leakage and training on copyrighted or sensitive material.</td>
</tr>
<tr>
<td colspan="3">MAIN INSIGHTS</td>
</tr>
<tr>
<td colspan="3">Stronger regional coordination, focus on Data Governance, enforcement, and integration of global best practices is needed.</td>
</tr>
</table>

[53] Chaher, Sandra, and Lina Cuellar. *Ser periodista en Twitter: violencia de género digital en América Latina*. 1st ed. Ciudad Autónoma de Buenos Aires: Comunicación para la Igualdad Ediciones; Bogotá: Sentiido; París: UNESCO, 2020. Digital book, PDF.

[55]Sistema Juridico Nacional: http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param1=NRTC&nValor1=1&nValor2=95290&nValor3=127168&strTipM=TC

[56] Gobierno de Mexico: https://www.gob.mx/profeco/es/articulos/la-ley-olimpia-y-el-combate-a-la-violencia-digital?idiom=es

[57] https://aiindex.stanford.edu/report/

Fragmented Regulatory Landscape
Latin America shows a growing commitment to data protection, often inspired by international standards like the GDPR.
However, enforcement capacity remains low, and most laws lack extraterritorial reach, limiting their effectiveness in a global digital ecosystem.

Divergence in Legal Maturity
Advanced Legal Frameworks: Brazil, Chile, and Mexico have relatively robust laws and institutional structures for data protection and governance.
Developing or Emerging Frameworks: Costa Rica shows efforts but lacks effective implementation; El Salvador and Honduras have limited or no comprehensive frameworks.
Honduras remains the most underdeveloped in terms of legal and institutional setup.

Weak Enforcement Mechanisms
Even in countries with formal legislation, enforcement is inconsistent or minimal. Most data protection authorities are under-resourced or lack autonomy. The territorial principle also limits possible enforcement for most Latin American countries.

Lack of Regional & Extraterritorial Provisions
The majority of laws in the region do not extend to foreign entities processing local data, reducing leverage over global digital platforms.

Uneven Data Governance Capacity
Brazil and Chile demonstrate coherent governance strategies tied to AI and digital transformation.
Countries like El Salvador and Honduras face institutional fragmentation, lack of interoperability frameworks, and poor data management.

Data Ecosystem Tiers
Advanced: Brazil, Chile, Mexico – high data availability and relatively mature governance.
Developing: Costa Rica – moderate capabilities but with limited integration.
Emerging: El Salvador, Honduras – significant structural and infrastructural barriers.

Data Sharing and Open Data Challenges
Open data initiatives exist but lack sustainability and long-term policy support.

Latin America scores 0.41 on the OECD OURdata Index, below the OECD average of 0.59, indicating challenges in availability and quality.

Data Interoperability
Brazil and Chile lead with open finance and fintech-related laws promoting standardized data exchange in the financial sector.
Other countries have no notable interoperability efforts in place.

Online Safety & Gender-based Digital Violence
Online violence against women is a major regional issue, especially for women in politics and media.
Only Brazil, Costa Rica, Mexico, and Chile have made significant legal efforts to criminalize and address digital violence.

Privacy and data protection are global concerns, ranked among top issues for companies deploying AI.
There is an increasing emphasis on privacy in responsible AI initiatives, particularly regarding risks like data leakage and use of sensitive training data.

5.8 Transparency

TABLE 24. PRINCIPLE OF TRANSPARENCY

The development of native AI models in the region remains incipient and limited. Beyond initiatives like LatamGPT and TeenyTinyLlama, the agency that Latin American Countries have no control over transparency in Foundational Models and limited in other AI Systems.	
Indicator: Promote clear understanding of AI processes and decisions	
Sub Indicator: Native AI Models	
Initiative	Description
LatamGPT	Open-Source Development: LatamGPT is designed as an open-source project, allowing developers and researchers across Latin America to access, study, and adapt the model to regional needs. This openness fosters transparency by enabling scrutiny and collaborative improvement of the AI system. Collaborative and Inclusive Approach: The project involves over 30 institutions and more than 60 experts from various Latin American and Caribbean countries. This broad collaboration ensures diverse perspectives are considered, promoting transparency in decision-making processes. Culturally Relevant Training Data: LatamGPT is being trained on extensive datasets that include regional dialects, idioms, and cultural references. By incorporating local linguistic and cultural nuances, the model aims to provide more accurate and contextually appropriate responses, enhancing transparency in its outputs. Ethical Frameworks and Data Governance: The initiative emphasizes strict ethical standards and data governance practices. It relies on publicly available data, respects copyright laws, and implements data anonymization techniques to protect individual privacy, thereby ensuring transparency in data usage.
TeenyTinyLlama	Open-Source Accessibility: TeenyTinyLlama is released under the permissive Apache 2.0 license, with its code and models publicly available on platforms like GitHub[58] and Hugging Face[59]. This openness allows researchers and developers to access, inspect, and build upon the work, fostering a collaborative environment. Detailed Documentation: The project provides comprehensive documentation, including training procedures, model architecture, and evaluation metrics. This level of detail ensures that users can understand the model's development process and limitations.

[58] https://github.com/
[59] https://huggingface.co/

	Acknowledgment of Limitations: The developers explicitly state the model's constraints, such as its primary design for Brazilian Portuguese and its unsuitability for deployment in real-world applications without further fine-tuning. They also caution about potential biases and inaccuracies, urging users to conduct their own assessments. Community Engagement: TeenyTinyLlama invites external contributions, promoting transparency through shared responsibility and collective improvement.
Indicator: Explainability and Traceability of AI operations and outcomes.	
Initiative	Description
LatamGPT	Traceability: LatamGPT is a joint effort involving over 30 institutions and more than 60 experts across Latin America and the Caribbean. This collective approach ensures that the model's development process is well-documented and traceable. By making its code and methodologies publicly accessible external review and replication is allowed and encourage. Explainability: By training the model on datasets rich in regional dialects, idioms, and cultural references, LatamGPT aims to produce outputs that are more understandable and contextually appropriate for Latin American users. The project incorporates ethical standards and data governance practices, ensuring that the model's decisions can be explained within a clear ethical context.
TeenyTinyLlama	Traceability: TeenyTinyLlama provides comprehensive documentation, including training procedures, model architecture, and evaluation metrics, facilitating full traceability of the model's development. Explainability: The developers explicitly state the model's constraints, such as its primary design for Brazilian Portuguese and its unsuitability for deployment in real-world applications without further fine-tuning. They also caution about potential biases and inaccuracies, urging users to conduct their own assessments.
Indicator: Accessible information about AI design and decision-making.	
LatamGPT	While specific technical documentation may not be publicly available yet, the project's approach emphasizes openness, inclusivity, and cultural relevance.

TeenyTinyLlama	The project provides detailed documentation, including training procedures, model architecture, and evaluation metrics. This level of detail ensures that users can understand the model's development process and limitations.
Indicator: Regional Status	
ILIA (2024)	• Only 2 countries have any mechanism for Transparency in AI • Chile is the regional leader in efforts to promote transparency, particularly through the ***Algoritmos Éticos, Responsables y Transparentes*** initiative. This multistakeholder project, led by GobLab UAI, developed standardized procurement guidelines and public sector tools to ensure transparency, data protection, and non-discrimination in algorithmic systems used by the state. These guidelines were adopted by ***ChileCompra*** and have been applied across multiple public agencies. They represent the first such measure in Latin America, setting a precedent for ethical algorithm procurement. Chile's digital governance model also emphasizes interministerial coordination and has published at least five tools and run 13 pilot programs incorporating transparency and fairness criteria in AI deployments. • Brazil has also advanced in this area through the creation of OBIA, its national observatory on AI, which was part of its 2021 AI strategy aimed at fostering transparency and accountability. • Only one out of 19 countries has implemented transparent and auditable citizen participation processes in their AI strategies, limiting broader traceability and feedback loops. • The report recommends avoiding direct adoption of external models (e.g., EU AI Act) unless institutional capacity is developed to sustain oversight and ensure traceability at scale.
Indicator: Global Benchmark	
The HAI AI Index 2024 Annual Report	Transparency Gaps: Inconsistent disclosures undermine efforts to evaluate ethical, environmental, and societal implications. Lack of Comprehensive Global Data The report highlights a lack of data for diversity in regions outside the U.S., Canada, and Europe, including Latin America. There's also minimal information on dimensions like sexual orientation and intersectionality in the AI workforce and education.
MAIN FINDINGS	
Absence of Participatory Oversight	

Most Latin American countries lack robust, auditable public participation mechanisms in the design and monitoring of AI strategies, limiting accountability and trust.

Citizen Engagement is Exception Rather Than Rule
Only 1 out of 19 countries in the region has implemented transparent and traceable citizen participation processes in AI policymaking.

Very Fragmented Progress Across the Region
While Chile and Brazil demonstrate leadership through specific initiatives and institutional development, the region overall remains uneven and underdeveloped in transparency and traceability practices.

Regulatory Gaps Undermine Enforcement
The majority of Latin American countries lack standardized legal frameworks that would mandate transparency and traceability in AI systems. Reliance on international guidelines is common. Domestic enforcement tools are scarce or nonexistent.

Weak Institutional Infrastructure
There is an urgent need for formal institutions dedicated to monitoring AI systems, ensuring data governance, and sustaining mechanisms for public scrutiny.

Need for Standards and Tool Development
Advancing traceable and transparent AI in the region requires the institutionalization of standards, development of operational tools for the public sector, and the promotion of multi-stakeholder governance models.

5.9 Human Rights[60]

TABLE 25. PRINCIPLE OF HHRR/ RIGHT TO WORK & FAIR WAGES

Right to Work and Fair Wages	
Indicator: right to decent work	
Sub Indicator: Regional Status	
Indicator	Regional Status
Artificial intelligence is transforming middle-class jobs. Can it also help the poor?	GenAI Adoption Is Widespread and Fast-Paced Unlike previous tech waves, GenAI is being adopted rapidly worldwide, with middle-income countries now accounting for over half of global GenAI web traffic. AI Skills Are Becoming a Workplace Standard In 31 surveyed countries, 66% of employers prefer candidates with AI skills—even over experienced professionals. In Latin America, AI literacy is becoming more valuable than years of experience. Access Gaps Create Unequal Opportunities Only 7–14% of LAC workers have jobs that can benefit from GenAI. These jobs are concentrated in urban, formal, and high-income sectors. In Mexico, the richest are 5.6 times more likely than the poorest to hold digitally exposed jobs. Digital Exclusion Is a Major Barrier 17 million LAC jobs could benefit from GenAI but lack basic digital tools. Disparities in internet, device access, and electricity remain significant obstacles. Risk of Job Loss from Automation 1–6% of LAC jobs face high risk of GenAI-driven automation. Affected sectors include finance, public administration, and customer service—often employing women and youth. Opportunity in Education and Healthcare GenAI could support under-resourced education systems and healthcare services through personalized instruction and remote care delivery. Structural Challenges Must Be Addressed A billion people globally lack access to reliable electricity. Foundational learning gaps persist across poor countries. Without policy action, GenAI could deepen existing inequalities.

[60] Human rights are the central focus of this analysis and are embedded in all the ethical principles of artificial intelligence discussed in this document, including safety, privacy, non-discrimination, and inclusion. Additionally, certain fundamental rights that complement and expand the scope of these ethical principles will be analyzed, such as the right to work, the right to freedom of expression and thought, and the right to education.

Buffer or Bottleneck ? Employment Exposure to Generative AI and the Digital Divide in Latin America	Metrics: • GenAI Exposure (Total): 30–40% regionally. • Augmentation Share: 8–12% across LAC countries. • Automation Risk: Only 2–5% of jobs. • "Big Unknown" Exposure: 14–21% of employment. • Unrealized Augmentation due to Digital Gaps: Affects ~6.2% of jobs held by women and men. • Between 30–40% of jobs in Latin America and the Caribbean (LAC) are potentially exposed to GenAI—primarily through augmentation, not automation. Only 2–5% of jobs are at risk of full automation. • Urban location, high education, formal employment, and high income are correlated with higher GenAI exposure. • Young people and women—especially in finance, insurance, and public administration—face greater automation risks. • A large segment of the labor force falls into the "big unknown" category (14–21%), where GenAI's future impact remains uncertain. • Almost 50% of jobs that could benefit from GenAI augmentation do not currently use digital tools (computers at work), limiting any productivity gains.
AI and the Increase of Productivity and Labor Inequality in Latin America[61]	• LLM exposure is greater among formal workers, high-income groups, and those with more education. • This implies a risk of widening labor and income inequality, as those already advantaged are better positioned to adopt and benefit from AI. • The top wage quintile shows more than double the LLM exposure of the lowest quintile, highlighting the digital divide. • Informal workers, who dominate large parts of Latin American labor markets, especially in Peru, are less exposed and less likely to benefit from these technologies.
	Income Inequality and Labor Dynamics AI adoption is accelerating in Latin America, with 82% of knowledge workers using generative AI—higher than any other region globally. Gender and Opportunity Gaps Underrepresentation of women in early access to AI training and power-user categories. Education and Reskilling A major opportunity lies in upskilling non-technical professionals, especially in emerging economies like those in Latin America.

[61] Inter-American Development Bank. (2024). *AI and the Increase of Productivity and Labor Inequality in Latin America: Potential Impact of Large Language Models on Latin American Workforce*. Retrieved from https://publications.iadb.org

<table>
<tr><td>2024 Work Trend Index Annual Report</td><td>Roles like administrative assistants, marketers, and project managers are actively adopting AI skills via platforms like LinkedIn Learning, signaling a shift toward broader, cross-sector education.

However, only 25% of companies globally plan to offer generative AI training, and the region reflects this gap. Latin American professionals are largely self-training, revealing structural deficiencies in institutional support.

BYOAI ("Bring Your Own AI") culture is thriving across all age groups in Latin America: 77% of AI users in the region bring external AI tools into the workplace, with Brazil (74%), Mexico (76%), and Colombia (83%) leading.
While these tools can enhance productivity, they also introduce serious risks, including data loss, IP leaks, security breaches, and compliance violations.

This reflects strong bottom-up demand, but also highlights unequal access to secure, enterprise-provided tools, raising issues around digital safety, access equity, and organizational readiness.

In Latin America, the lack of widespread formal training and clear regulatory guidance increases the risk of opaque AI systems reinforcing discrimination (e.g., in hiring algorithms or performance tracking).</td></tr>
<tr><td colspan="2">Sub Indicator: Country Status</td></tr>
<tr><th>Country</th><th>Status</th></tr>
<tr><td>Brazil</td><td>• High GenAI exposure
• Advanced digital infrastructure compared to regional peers.
• Still shows large internal inequalities in digital access.</td></tr>
<tr><td>Chile</td><td>High augmentation potential and better alignment with HIC exposure patterns.</td></tr>
<tr><td>Costa Rica</td><td>• Moderate GenAI exposure, similar to other upper-middle-income countries.
• Stronger access to digital tools, especially in urban centers.</td></tr>
<tr><td>El Salvador</td><td>• Exposure potential present, but undermined by limited digital access and infrastructure.
• High concentration of jobs in the "big unknown" and low augmentation realization.</td></tr>
<tr><td>Mexico</td><td>• High GenAI exposure (especially in urban/formal sectors), but extreme inequality:
• The richest quintile is 5.6x more likely than the poorest to work in jobs both exposed to GenAI and involving computer use.

• Major divide between potential and actual benefit due to digital access gaps.</td></tr>
<tr><td>Honduras</td><td>• One of the lowest in terms of infrastructure and augmentation potential.
• Exposure is limited by economic structure and low access to digital tools.</td></tr>
<tr><td colspan="2">MAIN INSIGHTS</td></tr>
</table>

AI’s impact on work in Latin America is less about immediate job loss and more about exacerbating long-standing inequalities in access, skills, and opportunity—calling for urgent, equity-focused policy action.

AI Is Reshaping Labor Markets Through Inequality, Not Mass Displacement
Contrary to fears of large-scale job loss, the core issue in Latin America is unequal access to AI tools and training, which deepens income and opportunity divides rather than reducing employment outright.

GenAI Benefits Are Concentrated in the Middle & Upper Class
GenAI is primarily impacting formal, urban, and educated workers—especially those in middle-income jobs. Informal and rural workers remain largely excluded from AI-related productivity gains.

Women and Youth Are Most at Risk of Automation
These groups are overrepresented in sectors with higher automation exposure, such as customer support and finance, and are underrepresented in AI-related training and decision-making spaces.

The Digital Divide
Inequitable access to digital infrastructure and devices limits GenAI's reach. Richer, urban workers are far more likely to benefit from AI augmentation than poorer, rural populations.

Structural Inequalities Compound AI’s Unequal Effects
The richest quintile in every country is significantly more likely to work in GenAI-exposed jobs and use digital tools. Inequality also plays out across gender, geography, and employment formality.

Training Gaps Reinforce Stratification
Despite high demand for AI skills (60% of employers in LAC prefer AI-literate candidates), only 25% of companies globally plan to offer GenAI training. In Latin America, professionals mostly self-train, revealing institutional failures in workforce development.

Gender Gaps Persist and May Deepen Without Intervention
Women are underrepresented in early AI training, usage, and leadership. Without targeted, gender-inclusive education and labor policies, AI adoption risks replicating and worsening existing labor market exclusions.

Regulatory and Training Vacuums Expose Workers to Risk
The absence of clear AI governance and formal training mechanisms increases the likelihood of biased, opaque systems in hiring and workplace management, especially in low-regulation environments.

Brazil and Chile Lead but Inequality Remains
These countries show the highest levels of AI readiness and exposure, with Chile showing the greatest augmentation potential. Nonetheless, all countries display internal disparities in digital access and training opportunities.

AI Skills Are Becoming the New Labor Market Currency
Employers increasingly prioritize AI aptitude over traditional experience, reinforcing a shift toward skill-based hiring. This favors those with early access to AI and marginalizes those excluded from emerging learning ecosystems.
Decent Work Requires Systemic Inclusion Strategies
Ensuring fair and inclusive AI integration demands coordinated investment in public training, digital access, ethical governance, and protections against bias and exclusion—particularly for vulnerable groups.

AI’s impact on work in Latin America is less about immediate job loss and more about exacerbating long-standing inequalities in access, skills, and opportunity—calling for urgent, equity-focused policy action.

TABLE 26. PRINCIPLE OF HHRR/ RIGHT TO FREEDOM OF THOUGHT

<table>
<tr><td colspan="2">Right to Freedom of Thought, Conscience, and Religion</td></tr>
<tr><th>Indicator</th><th>Regional Status (Other sources)</th></tr>
<tr><td>Censorship and Algorithmic Manipulation of Information</td><td><u>Filter Bubbles and Echo Chambers:</u>
Latin America has no control or real influence over the Content Recommendation systems of social media networks, yet we still suffer the consequences of these algorithms. AI-driven content recommendation systems limit exposure to diverse perspectives by reinforcing existing beliefs. This can polarize societies and restrict access to alternative worldviews.

<u>Manipulative content curation and algorithmic nudging</u>: AI systems used in social media, search engines, and news feeds can create filter bubbles or echo chambers by personalizing content in ways that reinforce certain views while hiding alternatives. This narrows the range of information available to individuals, potentially distorting perception and limiting independent thought

<u>Misinformation and Disinformation:</u> growing concern for the spread of mis and disinformation, particularly during electoral cycles or impotant political milestones.
Latin America's high smartphone penetration creates the ideal scenario for information consumption to be based on digital platforms.</td></tr>
<tr><td>AI-Generated Propaganda & Public Opinion Manipulation</td><td>According to the report "Disinformation: How to Understand It, Combat It, and Protect Yourself from Its Effects" by the Complutense University of Madrid and the Friedrich Naumann Foundation [62] (Rubio Núñez, R., et al. 2024) propaganda mechanisms exist in Latin America designed to manipulate public opinion in favor of or against individuals, agendas, or political parties.

In Mexico, during the 2024 elections, presidential candidate Xóchitl Gálvez used generative AI to produce campaign videos. Many viewers were unable to distinguish whether the videos they were watching featured Gálvez herself or a digital avatar. That same year, a deepfake video circulated on social media depicting Claudia Sheinbaum—now the President of Mexico—allegedly promoting a fraudulent financial scheme. In response to growing concerns, media outlets such as CNN en Español released reports to help the public identify manipulated content. One such piece, titled "Candidatas generadas con IA: ¿cómo identificar los 'deepfake' y las noticias falsas en elecciones?", is still available on their official YouTube channel.

Case Study Venezuela: The implementation of these manipulation strategies is particularly evident in electoral processes, as recently observed in the latest elections in Venezuela. However, this phenomenon affects all countries in the region to varying degrees, reflecting a growing pattern of disinformation and media control.</td></tr>
<tr><td></td><td></td></tr>
</table>

[62] https://www.freiheit.org/es/latin-america/desinformacion-como-entenderla-combatirla-y-protegerse

<table>
<tr>
<td>Mass surveillance and psychological profiling</td>
<td>AI-powered surveillance tools, facial recognition, and behavioral tracking systems can monitor individual activities and infer personal beliefs, opinions, or affiliations. In authoritarian or weakly regulated environments, this can lead to self-censorship and fear, undermining the ability to think or explore ideas freely.
Documented misuse by state actors[63]: In Mexico, El Salvador, and the Dominican Republic, Pegasus spyware has been used against civil society actors and journalists. Similar abuses have been reported in Panama, where surveillance tools were used to target political and business rivals.

Mass surveillance and biometric expansion[64]: Countries like Brazil have rapidly expanded facial recognition programs. Others have integrated license plate readers and camera networks into large-scale monitoring systems without safeguards.
Pandemic as a catalyst: COVID-19 further normalized surveillance through thermal cameras, contact tracing, and movement tracking, often with unclear data use policies.

Human rights concerns[65]: Experts argue that these technologies are inherently invasive and can systematically violate rights to privacy, due process, and freedom of expression. Once implemented, the tools remain in state hands and may be abused by future administrations
Widespread deployment of surveillance technologies: From spyware and biometric systems to mass data collection platforms, Latin American governments are investing in increasingly intrusive tools under the justification of public security.</td>
</tr>
<tr>
<td colspan="2">MAIN INSIGHTS</td>
</tr>
<tr>
<td colspan="2">Mechanisms of control and manipulation through microtargeting and engagement algorithms are widespread on social media platforms, where governments in the region have limited influence over how these systems operate or how content is moderated. At the same time, there is a generalized use of surveillance technologies and data collection—including biometric data—often without individuals' informed consent, due to legal loopholes and regulatory gaps. The recent scandal involving the use of Pegasus spyware on the devices of public figures and political actors has exposed that these practices are more common and systematic than publicly acknowledged.

Lack of Regional Control Over Algorithmic Systems
Latin America has no meaningful control or influence over the content recommendation algorithms used by major social media platforms. These systems, largely designed and governed outside the region, nonetheless shape public discourse and information access across Latin American societies.</td>
</tr>
</table>

[63] https://www.nytimes.com/es/2023/04/18/espanol/pegasus-mexico-gobierno-ejercito.html

[64] https://www.americasquarterly.org/article/surveillance-technology-is-on-the-rise-in-latin-america/

[65] Fontes, C., Hohma, E., Corrigan, C. C., & Lütge, C. (2022). AI-powered public surveillance systems: why we (might) need them and how we want them. ***Technology in Society, 71***, 102137. https://doi.org/10.1016/j.techsoc.2022.102137

Polarization Through Filter Bubbles and Echo Chambers AI-driven algorithms limit exposure to diverse viewpoints by reinforcing users' existing beliefs. This phenomenon contributes to ideological polarization, weakens democratic debate, and restricts individuals' ability to form independent or alternative perspectives. High Vulnerability to Misinformation and Disinformation The widespread use of smartphones and reliance on digital platforms for news and information make the region highly susceptible to the rapid spread of false and/or manipulated content. These risks are particularly pronounced during election cycles and politically sensitive moments. AI-Generated Propaganda Undermines Freedom of Thought Reports document the use of AI-enabled mechanisms to manipulate public opinion in favor of or against political figures and agendas. This manipulation erodes the cognitive autonomy of individuals, distorting the conditions necessary for free thought and informed decision-making. **(**Universidad Latina de Costa Rica, Digital Communication Observatory, 2025) Case of Venezuela Highlights Regional Risks The use of coordinated propaganda and disinformation strategies in Venezuela, especially around electoral processes, illustrates the extreme forms these practices can take. However, similar patterns are emerging across other Latin American countries, signaling a broader regional trend. Structural Threat to Democratic Freedoms The combined effects of algorithmic manipulation, disinformation, and digital propaganda present a structural threat to the right to freedom of thought. These dynamics undermine not only individual autonomy but also collective democratic resilience.

TABLE 27. PRINCIPLE OF HHRR/ RIGHT TO EDUCATION

Indicator: Education Status	
Source	Status
ILO & World Bank Working Paper 121 (2024)	Higher education correlates strongly with both automation and augmentation exposure. Workers with 14+ years of schooling are the most exposed to augmentation scenarios. Low-skilled workers remain underexposed, not due to protection, but because digital exclusion prevents participation in AI-augmented roles.
AI and the Increase of Productivity and Labor Inequality in Latin America (IDB, 2024	Higher educational attainment is strongly correlated with greater exposure to LLM (Large Language Model) technologies. Workers with graduate or postgraduate degrees are the most exposed, indicating that more specialized and complex roles are being transformed by LLMs. This reinforces the need to align training and education systems with evolving AI demands, particularly in digital skills, critical thinking, and adaptability.
ILIA (2024)	The Latin American education system is at a crossroads. While it retains many old-fashioned elements, there is a growing recognition of the need to align education with

	the demands of a digital, globalized economy. Continued investment in infrastructure, teacher training, and innovative curricula is essential for bridging this gap and preparing students for contemporary challenges. Reasons It May Be Considered Old-Fashioned Traditional Teaching Methods: Education in many Latin American countries often relies on rote learning and teacher-centered instruction. This approach limits critical thinking, problem-solving, and creativity, skills that are essential in today's knowledge-based economies. Mismatch with Labor Market Needs: Studies show a gap between the skills taught in schools and those demanded by employers. Key competencies like digital literacy, technological adaptability, and soft skills such as teamwork and communication are often underemphasized. Limited Integration of Technology: Despite advances in digital education, many schools, particularly in rural areas, lack the infrastructure and resources to integrate technology effectively into the curriculum. Inadequate Funding: Many countries allocate insufficient resources to education, resulting in outdated curricula, poorly trained teachers, and limited access to modern educational tools. Efforts to Modernize Digital Transformation: Programs like Uruguay’s Plan Ceibal and Brazil's São Paulo Media Center showcase efforts to integrate digital tools and platforms into education, providing students with access to modern learning resources. Competency-Based Education: Countries like Mexico and Chile have begun adopting competency-based models, focusing on skills such as critical thinking, entrepreneurship, and adaptability. Regional Initiatives: Organizations like UNESCO and CAF are promoting STEM education, digital literacy, and AI skills development in the region, highlighting an ongoing shift toward modernizing education systems. Focus on Lifelong Learning: Governments are beginning to recognize the importance of continuous education and upskilling, especially in response to technological disruptions in the workforce. Current Misalignment with Contemporary Demands While progress is being made, the pace of reform often lags behind the rapid evolution of global skill requirements. Challenges such as socioeconomic inequality, limited teacher training, and political instability further hinder efforts to modernize.

Indicator: Digital Education Country Status (Based on ILIA)	
Country	Status
Brazil	While infrastructure and policy lag behind Chile, Brazil has fully adopted AI in education programs and shows strong foundational education performance.

	• The Brazilian Strategy for Artificial Intelligence (EBIA), emphasizes AI education alongside development. • Above-average score in human talent development, with strong educational foundations in STEM and AI. • Brazil is the only country in the region ranked above global average in AI engineering skills. • Demonstrates robust integration of digital tools in education through platforms like Plurall, which serves over 7 million students with AI-based tools (lesson plans, summaries, adaptive content). • High scores in infrastructure and public digital services. • Moderate performance in AI-specific talent training (40.75/100) in Talent indicator • Holds the 13th position globally in AI engineering capabilities. • High risk of "Brain Drain" due to lack of incentives.
Chile	Chile is the regional leader in AI education and literacy, with comprehensive integration across school curricula and advanced talent development. • Strong AI literacy and penetration in Public education • Close coordination for AI adoption with universities • Leads the region in talent development with the highest score in AI literacy (74.3/100). • Strong institutional vision for AI and digital education, reinforced by international infrastructure projects (e.g., Humboldt cable) and public-private partnerships. • High adoption of educational technologies and public commitment to ethics and transparency in AI use.
Costa Rica	Solid preparation in science education and growing talent concentration in AI, but lacks full AI curricular integration. • Human Capital score of 46,99 Regional average • Moderate performance in digital talent (46.99/100), placing it in the middle tier . • Low institutional strength in AI strategies (6.25/100) for vision and institutionalization) • AI National Strategy does not include an AI-Education Strategy • Faces challenges in computer access and digital infrastructure expansion.
El Salvador	Lacks advanced talent development and faces structural limitations in foundational science and AI integration. • Weak development in digital talent (34.03/100) and very low infrastructure scores. • No national AI strategy or institutional structure to support digital education initiative
Mexico	Strong foundational education but limited full-scale implementation of AI education across levels.

	• Moderate digital talent score (43.91/100), but lacks a formal national strategy for AI education. • Potential hindered by absence of centralized coordination for AI-related educational efforts. • AI in Education Observatory[66]: this 2025, Mexico announced the creation of the AI in Education Observatory. with ANUIES and UNESCO participation, signaling an intent to monitor global best practices and guide national policy. • In Mexico, digital tools are being adopted and AI graduate numbers are rising, but a coherent national strategy is urgently needed.
Honduras	Adequate science education, but faces major challenges in talent retention, advanced training, and infrastructure. • Among the weakest in the region for digital education readiness. • Talent development score is low (37.19/100). • No AI strategy, limited access to devices and connectivity, and substantial gaps in institutional support.
Indicator: Education Infrastructure	
Education Infrastructure	Education infrastructure in Latin America faces significant challenges, including inadequate facilities, limited access to technology, and disparities between urban and rural areas. Many schools lack essential amenities, leading to overcrowded classrooms and environments that hinder effective learning. The COVID-19 pandemic exacerbated these issues, causing prolonged school closures that disrupted education for approximately 170 million children and adolescents in the region. This unprecedented interruption highlighted the fragility of existing educational infrastructure and the urgent need for resilient systems capable of adapting to crises.
Curriculum Content relevant to Digital Literacy	
Curriculum Content relevant to Digital Literacy	Just few Latin American Countries have initiated various programs to enhance digital literacy and build capacity in artificial intelligence (AI), aiming to integrate these competencies across public sectors and society. Subnational Efforts: Sao Paulo AcessaSP[67] AcessaSP is a digital inclusion program that provides free public access to computers and the internet, primarily targeting underserved communities. Established by the São Paulo

[66] https://www.unesco.org/en/articles/ai-will-be-service-education-and-people-mexico

[67] Passarelli, B., Guzzi, A. A., Angeluci, A. C. B., & Junqueira, A. H. (2014). The Impact of Mobility in Brazilian Info Centers: AcessaSP Case Study. *American International Journal of Contemporary Research*, 4(3), 1-10.

	state government, it offers training in basic digital skills to bridge the digital divide. The program has received national and international recognition, including an award from the Bill and Melinda Gates Foundation.
Indicator: Presence of authors from Latin America at the main AI conferences	
ILIA 2024	Latin American representation at major AI conferences remains minimal. A report on research and development in the region indicates that Latin American involvement in leading AI conferences is virtually absent, with limited participation from researchers and professionals at the most prestigious international AI events. This underscores a significant gap in visibility and engagement from Latin America in the global AI conversation. Nevertheless, efforts are underway to enhance AI engagement within Latin American universities, with the goal of integrating these institutions into the global AI landscape.
Indicator: Capacity building & Continuous Learning	
Source	Description
ILIA 2024	The ILIA 2024 report emphasizes ***Capacity Building & Continuous Learning*** as a central pillar for AI readiness in Latin America. The key points are: Strategic Focus on Capacity Building: Undergraduate and graduate programs in AI and related fields. Integration of AI literacy into primary and secondary education. Training and upskilling programs for the current workforce. These initiatives aim to build a skilled workforce, foster an informed society, and enable continuous adaptation to emerging AI technologies. Talent Development: The "Talento Humano" subdimension highlights: Basic competencies like computational thinking and STEM as priorities. A critical gap in AI-specialized engineering roles across the region, with only Brazil ranking above the global average. Ongoing brain drain since 2019, with more talent leaving than arriving—except in Costa Rica (and Uruguay) A deeper gender gap in AI literacy (22% female participation) compared to AI engineering (27%). Improving public education systems remains a prerequisite for equitable access to AI technologies.
Indicator: Global Benchmark	
The AI Index 2024 Annual Report	• There is a global momentum in Computer Science and AI education, particularly in North America and Europe. However, regional disparities in access, infrastructure, and inclusion persist. • A growing number of U.S. states are mandating computer science (CS) education in high schools.

	• However, access remains uneven, with large disparities between states and school districts. • A majority of new AI PhD graduates now enter the private sector (over 70%), signaling a continued "brain drain" from academia

MAIN INSIGHTS

AI education must be a strategic, equity-driven priority, not an add-on, to avoid reinforcing existing inequalities and to enable sustainable digital development across the region.

Strengthening Public Education Is Foundational
Equitable access to AI technologies depends on improving the overall quality and reach of public education, particularly in foundational science, computational thinking, and critical reasoning skills.

Persistent Structural Inequalities
Gender, income, and rural–urban divides continue to shape access to digital tools and educational opportunities. These disparities weaken the talent pipeline and limit the inclusive development of AI.

Need for Inclusive Educational Reform
AI education efforts must go beyond infrastructure and access. Curricula should be inclusive, gender-responsive, and designed to redistribute power and representation in digital ecosystems.

Fragmentation in National Strategies
Most countries still lack cohesive digital education strategies aligned with their national AI plans. This misalignment hinders implementation and scale-up of AI literacy initiatives.

Uneven Curriculum Integration Across Countries
Only Chile and Brazil have fully integrated AI into national curricula.
Costa Rica and Mexico show promising foundations but require stronger coordination between education, infrastructure, and policy.
Honduras and El Salvador face major deficits in both education quality and AI-specific training programs.

AI Literacy Gaps Are Widespread
Regional AI literacy is patchy and uneven, with wide disparities in science education quality, English proficiency, and teacher readiness. Without strategic investments, these gaps will deepen.

Retention Is as Critical as Formation
Talent formed in the region often migrates due to better opportunities abroad. Retaining skilled professionals is vital to building a sustainable AI ecosystem.

Urgent Need for Teacher Training
Long-term success requires targeted investment in teacher capacity, curriculum reform, and digital infrastructure—particularly in underserved regions.

AI Readiness Depends on Foundational Capacity
Without addressing basic educational gaps, especially in science and digital literacy, AI integration efforts will remain superficial and ineffective.

Digital Transformation

For Latin America to meaningfully engage in AI innovation, education systems must be reimagined to ensure inclusive participation in the digital economy.

AI education must be a strategic, equity-driven priority, not an add-on, to avoid reinforcing existing inequalities and to enable sustainable digital development across the region.

5.10 Accountability

TABLE 28. PRINCIPLE OF ACCOUNTABILITY

Indicator: Responsibilities in AI Deployment and Oversight	
Country/ Initiative	Description
Brazil	The National System for Regulation and Oversight of Artificial Intelligence (SINR). This system involves regulators and expert advisory bodies to ensure compliance and ethical use of AI technologies Competent authorities must be notified in the event of serious security incidents (e.g. threats to life, essential service interruptions, environmental harm, or violations of fundamental rights). Regulatory Agencies are tasked with monitoring experimental sandboxes where AI systems can be temporarily exempt from certain rules to encourage innovation.
Chile	Ministry of Science, Technology, Knowledge and Innovation (MinCiencia). Oversight is shared across a multi-agency interministerial committee, including ministries of economy, education, justice, defense, culture, etc. A Committee of Experts from academia, civil society, and the private sector supports strategic and normative guidance. Implementation is backed by an Action Plan with defined institutional responsibilities and execution timelines.
Costa Rica	The Ministry of Science, Innovation, Technology and Telecommunications (MICITT) leads the strategy and chairs the Executive Committee. Executive Committee: Composed of representatives from MICITT, private sector, academia, civil society, and education. It guides implementation and sets policy agendas. Territorial Oversight: Regional working groups (mesas territoriales) operate locally, anchored in innovation labs, to support regional execution and ensure accountability at subnational levels. PRODHAB: The Data Protection Agency ensures ethical AI usage and handles violations related to data misuse.

El Salvador	Creation of the National Artificial Intelligence Agency (ANIA) ANIA is established as the lead authority responsible for promoting, supervising, and enforcing the AI law. It operates as a functionally and technically autonomous body, reporting to the Office of the President. ANIA will coordinate compliance by all obligated parties and organize technical assistance programs and training for the general public. National AI Development Registry Managed by ANIA, this registry will identify developers and operators of AI systems. Its aim is to ensure the ethical and responsible use of AI by enabling traceability and oversight of actors and technologies deployed within the country. Oversight and Capacity Building ANIA is tasked with implementing assistance and capacity-building programs, which promote awareness, compliance, and responsible conduct by both public and private stakeholders. National AI Development Registry Managed by ANIA, this registry will identify developers and operators of AI systems. Its aim is to ensure the ethical and responsible use of AI by enabling traceability and oversight of actors and technologies deployed within the country.
Mexico	No Framework as of April 2025
Honduras	No Framework as of April 2025
Indicator: Legal and Ethical Liability for AI impacts	
Brazil PBIA (2024-2028)	Rights of Affected Individuals Individuals have the right to prior information, explanations, human involvement, and to contest decisions made by AI systems that significantly impact their interests. These rights create pressure for transparent and accountable system design and operation. Regulatory Sandboxes A framework for experimental sandboxes allows for innovation under monitored conditions, ensuring temporary regulatory flexibility with institutional oversight. Governance Programs Although optional, AI suppliers and operators may adopt governance programs aligned with the law. These programs can be used to demonstrate good faith and may mitigate sanctions, encouraging proactive accountability.
Chile	Aligns with international frameworks such as the OECD AI Principles and UNESCO's draft recommendations on the ethics of AI. Four core ethical principles guide the policy: • AI centered on human well-being and rights • Sustainable development • Inclusivity (e.g., gender, ethnic diversity, vulnerable groups)

	• Global, adaptive, and evolving AI development National legal frameworks such as Chile's laws on Data Protection, Consumer Rights, and Cybersecurity are acknowledged and linked.
Costa Rica (ENIA)	Data Protection Law (Ley No. 8968) Digital Signature Law Telecommunications Law International treaties on human rights and data protection
El Salvador	Integration with Other Legal Frameworks The AI Law is linked to the Data Protection Law and the Cybersecurity and Information Security Law, reinforcing responsibilities related to personal data handling and system security, and establishing a broader framework of legal accountability. Universal Applicability The law applies to all natural and legal persons involved in AI research, development, training, or implementation within El Salvador, regardless of their nationality. This universal scope enforces accountability across all actors in the AI ecosystem.
Mexico	No Framework as of April 2025
Honduras	No Framework as of April 2025
Indicator: Mechanisms for Oversight, Redress, and Enforcement in AI Governance.	
Brazil PBIA (2024-2028)	Risk-Based Liability Framework AI systems must be self-classified by developers based on risk. For high-risk or excessive-risk systems, suppliers and operators are strictly liable for damages (property, moral, individual, or collective), regardless of fault. This includes presumed fault through reversal of the burden of proof, ensuring that victims are protected and responsible parties are held accountable. Algorithmic Impact Assessment and Oversight High-risk systems are subject to mandatory compliance requirements, including impact assessments, robustness and accuracy testing, and human oversight. These mechanisms create ex ante accountability for potential harms. Prohibition of Harmful Practices The Bill prohibits AI systems from using subliminal techniques or exploiting vulnerabilities of specific groups. The government is also barred from using AI to classify individuals for discriminatory access to public services. These provisions ensure institutional accountability and prevent abuse. Notification of Incidents In cases of serious incidents (e.g., threats to life, service interruption, rights violations), authorities must be notified. This procedural obligation supports real-time accountability.

Chile	There is No dedicated enforcement body is established in the policy, but oversight is expected through existing regulatory agencies and sector-specific institutions. Monitoring mechanisms are embedded in the Action Plan, which includes: • Assignment of institutional responsibilities • Timeline and measurable objectives • Periodic updates and scenario planning for anticipatory governance Calls for: Evaluation of existing regulation for adequacy Legal adaptations to define institutional mandates Development of new legal instruments if needed Emphasizes public transparency, stakeholder participation, and inclusive deliberation as soft enforcement mechanisms.
Costa Rica	No enforcement agency is named, but mechanisms include: • Audits and human supervision in public deployments of AI. • Monitoring and evaluation phase of the strategy with defined performance indicators and feedback loops. • PRODHAB in handling data-related breaches or unethical AI practices. • Public transparency and societal participation are seen as key soft enforcement tools.
El Salvador	No Clear Mechanisms of Enforcement The AI Law does not yet detail mechanisms such as: audits, risk assessments, or sanctions that would deepen enforcement capacity.
Mexico	No Framework as of April 2025
Honduras	No Framework as of April 2025
Indicator: Global Benchmark	
The AI Index 2024 Annual Report	88% of surveyed organizations believe that developers of foundation models should bear the responsibility for mitigating risks associated with their AI systems. Lack of standardized responsible AI practices and reporting frameworks weakens real-world accountability. Developers often use different benchmarks to evaluate model safety and fairness, making it difficult to compare models or hold any party accountable for failures. Transparency and Traceability Deficits The report introduces a Foundation Model Transparency Index, which revealed that many leading developers score poorly on transparency, especially in disclosing training data, model architecture, and methodologies. This lack of transparency directly impacts the enforceability of accountability, as without access to foundational documentation, external auditing or redress is severely limited. Regulation and Accountability

	AI-related regulation is rising sharply, particularly in the United States (56.3% growth in 2023 alone), signaling growing institutional attempts to enforce accountability. However, few concrete legal mechanisms yet exist to assign liability in cases of AI misuse, particularly for foundation models and generative AI applications. The AI Incident Database recorded a 32.3% increase in AI-related incidents in 2023, highlighting the urgency for stronger accountability frameworks. Many of these incidents involved privacy violations, misinformation, and reputational harm.
MAIN INSIGHTS	
Enforcement Mechanisms Are Critically Underdeveloped or Nonexitent Across the region, accountability suffers from weak or nonexistent enforcement structures. There are few legal penalties or remediation pathways when harm occurs, especially in the public sector or with foreign-deployed AI systems. Legal Liability Remains Ambiguous A central gap is the lack of clarity around who is legally responsible when AI causes harm (developers, deployers, or end users). This legal vacuum limits both deterrence and access to justice. No Standardized Accountability Frameworks There is no consistent use of responsible AI benchmarks or reporting standards. Developers operate with fragmented tools and indicators, making accountability assessments and cross-country comparisons ineffective. Accountability Must Start at the Development Stage Emerging consensus suggests that accountability should be embedded early—during design and training—not only at the deployment or application phase. Yet institutional capacity for such oversight is still lacking. Citizen Oversight Is Nearly Absent Public participation in AI governance is minimal. Mechanisms for community consultation, feedback, or complaints are either symbolic or non-existent, undermining legitimacy and democratic accountability. Cross-border Accountability Gaps Persist Many AI tools used in Latin America are developed abroad, and there is no effective legal or institutional structure to enforce accountability across jurisdictions. This weakens data governance and undermines the principle of territorial accountability. Urgent Need for Regional Coordination and Legal Reform Without stronger legal mandates, regional governance structures, and audit tools, AI accountability will remain aspirational. Greater coordination is needed to standardize liability rules, reporting requirements, and impact assessments. Risks of Systemic Unfairness and Impunity The lack of clear responsibilities and consequences creates an ecosystem where harmful or biased systems may continue operating unchecked, particularly in sensitive sectors like welfare, justice, and policing. AI accountability in Latin America remains structurally fragile, with significant gaps in legal, institutional, and public oversight.	

5.11 Environmental Impact

TABLE 29. PRINCIPLE OF ENVIRONMENTAL IMPACT

Indicator: AI's energy use and environmental consequences	
Energy transition	
Country/ Initiative	Description
ILIA 2024 REPORT	Energy Use in AI Development: While AI hardware and computational needs are energy-intensive, the report emphasizes that AI technologies in Latin America could drive innovations in energy efficiency and contribute to the energy transition goals, including optimizing grid operations, forecasting renewable energy production (like solar and wind), and improving the efficiency of energy consumption. The report stresses the intensive energy and water consumption of data centers that support AI models, especially during training and inference phases. GPU usage, a backbone of modern AI models, consumes significantly more electricity than CPUs. Despite ongoing industry efforts to improve efficiency, energy demand is expected to grow at unprecedented rates. Infrastructure and Clean Energy: The document highlights the regional opportunity to leverage clean energy sources for the development of AI infrastructure. Countries like Costa Rica, with advancements in energy sustainability, are uniquely positioned to develop data centers and AI-driven industries using clean, renewable energy sources.
IEEE, The Role of Artificial Intelligence in Latin America's Energy Transition[68]	Brazil: Energy Transition: Brazil is a key player in Latin America's energy transition, primarily utilizing hydropower but increasingly integrating wind and solar power. It leads the region in wind energy capacity. AI Integration: Brazil is at the forefront of AI integration in energy, focusing on smart grid technology, with ongoing AMI (Advanced Metering Infrastructure) deployment. Challenges: Brazil faces challenges related to grid stability due to decentralized energy production and needs improved forecasting systems, particularly for wind and solar energy integration. Chile: Energy Transition: Chile leads in solar energy capacity in Latin America, with vast potential in the Atacama Desert. The country is also advancing in AI applications for energy management.

[68] **Meza Jimenez, V., & Pérez, E.** (2022). *The Role of Artificial Intelligence in Latin America's Energy Transition*. IEEE Latin America Transactions, 20(11), 2404–2412. doi:10.1109/TLA.2022.

	AI Integration: AI is used for improving solar forecasting, but challenges remain due to the environmental conditions of the desert regions. Challenges: Solar forecasting accuracy is a key barrier to the large-scale deployment of solar power in Chile, and AI-driven techniques are being researched to overcome this. Costa Rica: Energy Transition: Costa Rica is not specifically detailed in this document, but it is known for its strong commitment to renewable energy, relying heavily on hydroelectric and geothermal power sources. AI Integration: No information in the document El Salvador: Energy Transition: El Salvador is part of the regional efforts toward energy transition with growing efforts in renewable energy adoption. AI Integration: El Salvador's integration of AI in energy is not specified, but like other Central American countries, there are ongoing efforts to modernize the grid with emerging technologies. Mexico: Energy Transition: Mexico has a growing focus on wind and solar energy. It faces challenges with energy distribution across vast areas and urbanization. AI Integration: AI plays a role in forecasting and load management, particularly for wind and solar energy. AI tools are used to optimize energy distribution and storage. Challenges: Mexico's energy sector is highly dependent on traditional energy sources, and AI adoption is crucial for optimizing energy grid stability and reliability. Honduras: Energy Transition: Honduras is making progress in integrating renewable energy sources, particularly solar and wind. AI Integration: Similar to other Central American countries, AI adoption in energy systems is still in its infancy, with efforts focused on grid modernization.
AI Energy Consumption/ OLADE - Latin American Energy Organization[69]	By 2035, artificial intelligence (AI) is projected to consume 5% of Latin America and the Caribbean's total electricity—over 120 TWh annually—according to OLADE. This surge stems from the rapid growth in data processing centers, currently at 455 in the region, and a global trend forecasting a 165% increase in such infrastructure by 2030. AI data centers in LAC already use 1.6% of the region's electricity.

[69] https://www.olade.org/en/editoriales/march-2025by-2035-artificial-intelligence-will-demand-5-of-the-electricity-consumed-in-latin-america-and-the-caribbean/#:~:text=Taking%20into%20account%20the%20projected,to%20just%20over%20120%20TWh.

	A 15% annual increase in data centers is expected through 2030, significantly raising energy demand. AI could compete with essential sectors like residential and industrial for electricity. Urges integration of AI expansion with energy planning, improved efficiency standards, and renewable energy investments to avoid negative environmental impacts.
Brazil	Energy Transition Program (PATEN): Launched to promote renewable energy and decarbonization, with support from the National Development Bank (BNDES). Includes a Green Fund to finance low-carbon initiatives and modernization of energy infrastructure. Offshore Wind Law: Enacted in January 2025, it authorizes offshore wind development, aiming to boost clean energy capacity and attract investment. Massive Infrastructure Investment Plan (PAC): Nearly USD 200 billion will be invested in energy, transportation, and infrastructure over the next four years. While ambitious, there's some skepticism due to historical inefficiencies.
Chile	Energy Transmission for Decarbonization: Legislation prioritizes expanding the electric grid to support increasing renewable energy generation. Green Hydrogen Leadership: Chile is positioning itself as a global hub for green hydrogen, especially in the Magallanes region. Major projects like HNH Energy (USD 11 billion) are underway. Public Participation in Climate Goals: The government launched a public consultation on its Nationally Determined Contributions (NDC) for 2025–2035, focusing on reducing emissions and enhancing transparency.
Costa Rica	Global Leader in Renewable Energy: Over 98% of electricity has been generated from clean sources in recent years. Generation Expansion Plan (2022–2040): Long-term planning focuses on reducing fossil fuel dependency while maintaining grid stability through renewable sources. Green Transport Revolution: Integrated initiatives promote electrification of transport and industrial decarbonization.
El Salvador	Geothermal Energy Expansion: With World Bank support, the country is expanding geothermal generation and direct heat applications. Renewable Energy Growth: In 2024, hydro and geothermal sources dominated generation, contributing over 4,600 GWh. National Energy Policy 2020–2050: Emphasizes replacing fossil fuels with renewables, improving energy efficiency, and lowering electricity tariffs.

Mexico	2025 Energy Reform: Strengthens the dominance of state-owned CFE and Pemex, allowing greater flexibility in public-private energy ventures. National Electricity System Expansion Plan (2025–2030): Involves 51 projects worth over USD 22 billion, focusing on wind, solar, and combined-cycle plants. Infrastructure Modernization: CFE will build 12 new power plants across 9 states to boost capacity and grid resilience.
Honduras	Renewables Target: Plans to increase renewable energy's share to 80% by 2038 (from 60% in 2023). Regulatory Improvements: New policies aim to reduce fossil fuel dependency and attract renewable energy investments. Universal Energy Access Plan (PAUEH): Includes over 170 mini-grid and hybrid solar projects targeting rural electrification.
Critical Minerals: REGIONAL STATUS	
Country/Report	Status
OLADE 2024 Critical Minerals for Energy Transitions of Latin America and the Caribbean[70]	Critical Minerals for Energy Transitions of Latin America and the Caribbean: Analyzes the role of Latin America and the Caribbean (LAC) in supplying critical minerals essential for the global energy transition. It argues that LAC holds a strategic position due to its vast reserves of key minerals such as copper, lithium, silver, nickel, and bauxite—resources fundamental to decarbonization technologies including renewables, electrification, batteries, and e-mobility. The region accounts for approximately 25% of the global critical minerals market. LAC is a major producer of copper and lithium, both central to clean energy technologies. There is an opportunity for LAC to move from raw material exporter to value-added producer. Critical minerals are defined contextually, based on industrial dependency, scarcity, and geopolitical relevance.The document distinguishes between globally "critical" and regionally "strategic" minerals for LAC, prioritizing based on market relevance, reserves, and production capacity. Global decarbonization goals will multiply the demand for minerals, with lithium demand projected to increase 40-fold by 2040. Scenario planning shows how different technological pathways (e.g., wind, solar, EVs) affect mineral demand patterns. Global energy models (IEA, IRENA) often overlook region-specific mining implications. The study proposes a five-axis action plan: • socio-environmental sustainability

[70] Siroit, G. (2024). *Critical Minerals for Energy Transitions of Latin America and the Caribbean*. Latin American Energy Organization (OLADE). ISBN: 978-9978-70-157-7.

	• energy transition alignment • state capacity building • financial strategies • technological development. There is Emphasis on *"green mining"* practices: lower emissions, reduced water usage, and social inclusion. But this has been debated. Recycling and circular economy principles are promoted, particularly for copper and aluminum. Strengthening governance and transparency is essential to secure social license and investment.
	Critical Mineral: Country Status based on OLADE 2024
Country	Minerals
Brazil	-Nickel: Holds 16% of global nickel reserves. -Graphite, Lithium, Rare Earths: Significant reserves, positioning Brazil as a potential key supplier. - Rare Earths: The Serra Verde project in Goiás has received backing from the US-led Minerals Security Partnership, aiming to diversify supply chains away from China's dominance. - Lithium: Chinese company BYD has acquired mining rights in Brazil's "Lithium Valley," indicating growing international interest.
Chile	It has the world's largest copper deposit and the fourth largest lithium deposit. -Copper: World's largest producer, accounting for about 25% of global supply. - Lithium: Holds over one-third of the world's lithium reserves and is the second-largest producer globally. - Recent Developments: Studies have found a 28% increase in lithium resources, enhancing Chile's strategic position. - Policy: The government is preparing a national strategy for critical minerals to leverage these resources effectively.
Costa Rica	- No exploitation of Critical Minerals - Mining Policy: Historically maintained a moratorium on open-pit mining, limiting the exploration and exploitation of mineral resources.
El Salvador	- Policy Reversal: In December 2024, the government lifted the mining ban, citing potential economic benefits from untapped mineral resources. -No concrete projects have been initiated.
Mexico	- Silver: World's largest producer. - Copper: Among the top global producers. - Lithium: Holds estimated resources of 1.7 million tons; however, recent nationalization efforts have raised concerns about the capacity to develop these resources effectively. - Policy Challenges: Government policies have introduced uncertainties, potentially hindering the development of critical mineral resources.

Honduras	- Limited Data: Specific information on critical mineral reserves and production is scarce. - Geopolitical Interest: Recent shifts in foreign relations, including engagement with China, may influence future exploration and development of mineral resources.
GenAI is resource-intensive	Metrics and Data Points[71] Training GPT-3 consumed an estimated 1,287 MWh of electricity and generated 552 tons of CO_2 emissions. North American data center power use rose from 2,688 MW (2022) to 5,341 MW (2023). Global data center electricity use in 2022 was 460 TWh, placing them as the 11th largest electricity consumer worldwide. By 2026, global consumption is projected to reach 1,050 TWh, ranking data centers 5th globally in electricity use. Each ChatGPT query consumes roughly 5x more electricity than a basic web search. For every 1 kWh used, a data center may require 2 liters of water for cooling. GPU shipments to data centers rose to 3.85 million units in 2023, up from 2.67 million in 2022.
Water consumption	ILIA (2024), refered above stresses the intensive energy and water consumption of data centers that support AI models, especially during training and inference phases. GPU usage, a backbone of modern AI models, consumes significantly more electricity than CPUs. Despite ongoing industry efforts to improve efficiency, energy demand is expected to grow at unprecedented rates. The exploitation of critical minerals is also often water-intensive, particularly during the extraction stage. Water and biodiversity are affected: Cooling data centers requires large volumes of water, which can harm ecosystems and strain municipal resources.
Indicator: Global Benchmark	
The AI Index 2024 Annual Report	Mentioned as part of longer-term sustainability challenges but no metrics or benchmarks presented.
MAIN INSIGHTS	
The AI–Sustainability Nexus in Latin America Is Emerging but Underdeveloped The connection between AI deployment and environmental sustainability is gaining attention in the region, but remains fragmented and lacks formal policy integration.	

[71] https://news.mit.edu/2025/explained-generative-ai-environmental-impact-0117

Generative AI Imposes High Environmental Costs

Generative AI models require vast amounts of electricity, water, and hardware resources. Their training, deployment, and frequent updates result in high emissions and unsustainable resource consumption, exacerbating environmental pressures in countries with fragile ecosystems and weak regulatory oversight.

Data Center Expansion Is Environmentally Unsustainable

The rapid increase in data center construction—fueled in part by AI—poses serious environmental risks due to high energy and water demands, often met with fossil fuel-based energy and lacking accountability mechanisms.

AI Hardware Production Deepens Ecological Impacts

The manufacture and transport of GPUs and other AI components depend on resource-intensive mining and processing, contributing to pollution, carbon emissions, and material depletion—especially critical in regions like South America, rich in key minerals.

Latin America Plays a Strategic Role in the Energy Transition

The global shift to clean technologies has intensified demand for minerals like copper and lithium, positioning South America as a vital supplier. However, the region must engage more assertively in global negotiations to secure equitable terms and value retention in supply chains.

Regional Coordination Is Essential

Fragmented national strategies are insufficient to meet the scale of global demand or shape international markets. A coordinated regional strategy is crucial to increase bargaining power, scale production sustainably, and mitigate local social and environmental costs.

Community Conflict and Social Tension Undermine Extraction Projects

The growth in mineral extraction has led to increased socio-environmental conflict, driven by inequitable benefit distribution, poor consultation with Indigenous communities, and environmental degradation.

There Is a Policy Gap Linking AI to Environmental Accountability

Most Latin American countries lack explicit regulation that connects AI development with environmental obligations, such as emissions tracking, energy disclosure, or sustainable hardware procurement.

Environmental and Digital Policy Aren’t Yet Aligned

Institutional coordination between sustainability agendas and digital transformation strategies is limited, weakening the region’s ability to address AI's ecological footprint comprehensively.

AI Has Untapped Potential for Conservation

While some projects use AI for ecological monitoring or biodiversity protection, these remain isolated efforts rather than components of a broader environmental or digital strategy.

Urgent Need for Systemic Integration

Without systemic, policy-driven integration of environmental and social considerations into AI governance,

Latin America risks exacerbating inequality, ecological degradation, and missed opportunities for responsible innovation.

5.12 Multi-Stakeholder Collaboration

TABLE 30. MULTI-STAKEHOLDER COLLABORATION

Indicator: Foster regional and international cooperation on AI ethics	
Sub Indicator: International Cooperation	
Country/ Initiative	Description
Santiago Declaration Forum of High Authorities on the Ethics of Artificial Intelligence in Latin America and the Caribbean[72] (2024)	The forum creates a space for permanent, structured, and inclusive decision-making in AI ethics and strategy. Participant Countries: Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Montserrat, Peru, Paraguay, the Dominican Republic, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Uruguay, and Venezuela. The forum reinforces the notion that AI governance must emerge from and include the Global South. Ensures that AI benefits and safeguards are contextualized within local realities and socio-political needs. Regional Political Coordination High-level officials from 24 LAC countries participated. The ***Santiago Declaration*** affirms a shared commitment to ethical AI development. The event marks the launch of the ***Regional Artificial Intelligence Council***—the world's first official body of this kind for AI policy coordination. Shared Ethical Priorities Emphasis on non-discrimination, algorithmic transparency, and personal data protection. Recognition that AI development must reflect LAC's cultural, linguistic, and data sovereignty. Rejection of Global North hegemony in shaping AI norms and technologies Chile's Leadership in AI Chile hosts the forum and is regionally acknowledged for its advanced AI policy (2021), institutional framework, research centers, and training infrastructure. Chile ranks highest in the Latin American AI Index (ILIA). Institutional Momentum Priorities of the Forum include:

[72] https://foroialac.org/en/

	• talent development, • ethical regulation, • infrastructure for data and computing, and • deployment of impactful use cases.
AI Contribute to sustainable development goals (SDGs)	
CAF (2024). ***AI and the SDGs in Latin America and the Caribbean***[73].	Participatory Governance: Tools like CiudadanIA and Taína enhance citizen engagement and streamline government services. Inclusivity: AI solutions with multilingual and culturally adapted interfaces (e.g., Taína in Dominican Republic) increase service accessibility. Risks: Risk of automating exclusion or reinforcing bias without human oversight. Strong need for citizen participation in AI governance design. SDG 17: Partnerships for the Goals AI Contributions: Regional Strategies: LATAM 4.0 fosters collaboration between countries like Honduras and the Dominican Republic, with GENIA and ALIA playing coordinating roles. South-South Cooperation: Joint declarations (Santiago, Montevideo) formalize regional AI ethics frameworks. Global Influence: Participation in the G20 and UN forums strengthens LAC's collective voice in international AI governance. Outcomes: Emergence of a unified LAC roadmap for AI aligned with human rights and sustainable development.
Brazil	Formalized, participatory strategy with advisory bodies Involvement of private sector and academia in public service design; partial multistakeholder methodology • The Brazilian Strategy for Artificial Intelligence (EBIA) was developed through a broad participatory process, involving academia, civil society, and the private sector. • Aims to foster democratic governance by including multisectoral advisory boards in AI policy development. • Promotes collaboration with international organizations (e.g., UNESCO) and emphasizes public consultation in regulatory processes.
Chile	High formal inclusion: academia, civil society, private sector, general public in "Comité Asesor de IA" Advisor Comitee.

	National strategy featured centralized consultation, regional workshops, and a final public digital consultation • Actively engages in co-governance frameworks through bodies like CENIA (National AI Center), which includes stakeholders from government, academia, private sector, and civil society. • Hosted the Ministerial Forum on AI Ethics (2023), where over 30 countries and stakeholders shaped the Santiago Declaration. • Hosted the Forum of High Authorities on the Ethics of Artificial Intelligence in Latin America and the Caribbean (2024), where over 30 countries and stakeholders shaped the Santiago Declaration. • Strong commitment to inclusive and participatory dialogue, both in national policy and international forums.
Costa Rica	lack of formal multistakeholder methodology: • Advocates for multistakeholder collaboration in its public statements and policy orientations, especially on data protection and digital rights. • Participated in the UNESCO AI ethics process and regional forums promoting participatory approaches. • While formal AI policy is still evolving, public institutions show openness to civil society and international advisory involvement.
El Salvador	Law does not include formal multistakeholder design processes; limited transparency about participatory mechanisms: • Limited formal mechanisms for multistakeholder engagement in AI policy. • Some involvement through regional cooperation forums (e.g., the Santiago Declaration). • Law for the Promotion of Artificial Intelligence and Technologies: there is no indication of a multistakeholder governance model (e.g., advisory councils, civil society representation, or structured engagement with academia or the private sector). The law will encourage AI under a “código abierto” (open code) model, potentially enabling global collaboration. This could facilitate decentralized contributions but is not directly tied to a participatory governance structure.
Mexico	No documented formal stakeholder engagement during national strategy design in reviewed documents:

	• Developed its Proposed Mexican National AI Agenda (OECD)[74] framework via open consultations, including input from academia, civil society, and the private sector. • Initiatives like CiudadanIA (GENIA) exemplify participatory design and citizen-driven AI service development. No evidence of multistakeholder processes; scored 0 in both dimensions of ILIA assessment • Strong alignment with UNESCO's ethical AI framework, promoting engagement across sectors.
Honduras	No evidence of multistakeholder processes; scored 0 in both dimensions of ILIA assessment
Indicator: Global Benchmark	
The AI Index 2024 Annual Report[75]	Calls for global governance models indicates the need for multilateral cooperation.
MAIN INSIGHTS	
Regional Aspirations vs. Reality There is a stated commitment to regional coordination on AI governance. However, tangible outcomes—such as harmonized regulation or a unified negotiating bloc—are still lacking. Energy and water consumption: The intensive energy and water consumption of data centers that support AI models, especially during training and inference phases. GPU usage, a backbone of modern AI models, consumes significantly more electricity than CPUs. Despite ongoing industry efforts to improve efficiency, energy demand is expected to grow at unprecedented rates, this can create tensions for natural resources such as water. Asymmetry in Multistakeholder Engagement • Chile leads the region with structured, transparent, and iterative multistakeholder processes. • Brazil, Colombia, Uruguay include some sectors (e.g., private, academic), but lack formalized, inclusive governance frameworks. • Mexico, Costa Rica, El Salvador, Honduras exhibit minimal to no formal multistakeholder involvement in AI policymaking.	

[75] https://aiindex.stanford.edu/report/

These gaps point to structural inequalities in participation and voice within AI governance.

Core Ethical and Governance Principles Identified
These are seen as baseline ethical requirements for AI development in the region.

Contextualization of AI Development
There is an explicit call for AI systems and governance frameworks that respect:

- Cultural diversity
- Linguistic plurality
- Data sovereignty specific to Latin America and the Caribbean (LAC)

Geopolitical Positioning
The region articulates a rejection of Global North dominance in setting global AI norms and infrastructures.
The region requires greater regional agency and epistemic sovereignty in global AI negotiations.
A coordinated regional approach could enhance influence in international forums and with Big Tech actors.
Lack of coordination risks fragmentation, weakened bargaining power, and deepened internal disparities.

Latin America is on a critical path to developing equitable and sustainable AI governance. Despite growing momentum, as we have described throughout the principles, the region faces deep structural and institutional gaps, including fragmented regulatory frameworks, limited institutional capacity, and weak data sovereignty.

AI benefits remain unequally distributed, and if the region do not create the conditions for tackle this, existing gaps could increase, exacerbating gender, geographic, and socioeconomic divides. Technical and ethical oversight mechanisms are insufficient, while rising privacy, cybersecurity, and environmental risks remain largely unaddressed. Regional asymmetries can deepne and further complicate collective action and dilute the impact of global and multilateral initiatives. Addressing these challenges requires systemic reforms integrating human rights, environmental sustainability, and inclusion into national and regional digital strategies. Strengthening institutional infrastructure, enhancing regulatory coherence, and fostering regional cooperation will be essential for building trustworthy AI systems that serve the public good.

CHAPTER VI

6. CROSS-IMPACT ANALYSIS (CIA)

Since ethical principles are interrelated, they cannot be analyzed in isolation. Some principles function as enablers of others—for example, security is a necessary condition for ensuring data protection. Others are interdependent, meaning that the violation of one automatically affects another, as is the case with gender equality and non-discrimination.

There are also principles whose relationship may generate tensions. (e.g. Accesibility and Security) Strengthening one may weaken another, requiring a balanced approach. For instance, increasing privacy protections could restrict accessibility for certain user groups.

Understanding these relationships—whether enabling, interdependent, or in tension—is essential for designing more effective public policies and addressing trade-offs in a comprehensive and sensitive way, minimizing negative impacts.

TABLE 31. CROSS-IMPACT MATRIX OF AI ETHICAL PRINCIPLES RELATIONSHIP

Causal/ Affected	Propor tionality	Secu rity	Fair ness	Non-Disc.	Gender Eq	Access ibility	Sustain ability	Priva cy	Data Prot.	Trans Parency.	HHRR	Account ability	Inclusi veness	Environ ment	Multi Stakeh.
Propor tionality	–	→	✓	✓	→	→	→	↔	↔	→	✓	✓	→	→	→
Security	→	–	→	→	–	✖	–	↔	↔	✖	✓	→	✖	→	✓
Fairness	✓	→	–	↔	↔	↔	→	→	→	→	✓	↔	↔	→	✓
Non-Discrim.	✓	→	↔	–	↔	↔	→	→	→	→	✓	↔	↔	→	✓
Gender Equality	→		↔	↔	–	↔	→	–	→	→	✓	↔	↔	→	✓
Access ibility	→	→	↔	↔	↔	–	→	↔	✓	→	✓	↔	✓	→	✓
Sustain ability	✓	→	✓	→	→	→	–	→	→	→	✓	→	→	↔	✓
Privacy	↔	✖	→	→	→	✖	→	–	↔	↔	✓	↔	→	–	→
Data Prot.	↔	✖	→	→	–	✖	→	↔	–	↔	✓	↔	→	–	→
Trans parency	→	✖	→	→	→	→	→	↔	↔	–	✓	↔	↔	→	✓
HHRR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓
Account ability	✓	→	↔	↔	↔	→	→	↔	↔	↔	✓	–	↔	→	✓
Inclusiv.	→		↔	↔	↔	✓	→	→	→	↔	✓	↔	–	→	✓
Environ. Impact	→	→	→	→	→	→	↔			→	✓	→	→	–	✓
Mul-Stakeh.	→	✓	✓	✓	✓	✓	✓	→	→	✓	✓	✓	✓	✓	–

Legend:
✓ Strong reinforcement
→ Enables or supports
↔ Mutual dependency
✖ Potential tension (requires balancing)
Blank = weak or indirect relation

TABLE 32. CROSS-IMPACT MATRIX OF AI ETHICAL PRINCIPLES INFLUENCE

Causal/ Affected	Propor tionality	Secu rity	Fair ness	Non-Disc.	Gender Eq	Access ibility	Sustain ability	Priva cy	Data Prot.	Trans Parency.	HHRR	Account ability	Inclusi veness	Environ ment	Multi Stakeh.
Propor tionality	0	2	3	2	2	3	2	2	2	1	3	2	2	2	3
Security	1	0	3	3	1	1	0	1	3	3	3	1	1	3	3
Fairness	3	2	0	2	1	3	2	1	1	2	3	2	3	1	3
Non-Discrim.	3	3	2	0	1	2	1	2	3	2	3	3	3	1	3
Gender Equality	2	2	3	3	0	1	3	0	3	1	3	1	3	1	3
Access ibility	1	3	3	2	3	0	3	3	3	2	3	1	3	3	3
Sustain ability	3	1	1	1	1	1	0	1	1	1	3	2	1	3	3
Privacy	1	3	3	1	1	3	1	0	3	2	3	1	1	0	2
Data Prot.	3	3	1	2	0	3	1	3	0	3	3	3	2	0	2
Trans parency	1	3	2	2	2	3	2	3	3	0	3	2	2	2	3
HHRR	3	3	3	3	3	3	3	3	3	3	0	3	3	3	3
Account ability	0	3	2	2	1	3	0	2	3	3	3	0	2	0	2
Inclusiv.	0	2	1	2	0	0	1	2	2	1	3	2	0	2	3
Environ. Impact	1	1	3	0	2	2	3	2	0	3	3	3	3	0	2
Mul-Stakeh.	2	2	2	2	2	3	3	2	3	2	3	2	3	3	0

Values range from 0 to 3 and represent the influence level one principle (row) has on another (column):
0 = No influence
1 = Low influence
2 = Moderate influence
3 = High influence

The relationship between different ethical principles varies in intensity. Some principles are connected or reinforce each other but with a low level of influence, as in the case of security and proportionality. In contrast, other principles strongly influence one another—for example, transparency in data management has a significant impact on ensuring privacy and data protection.

RISK AREAS

Based on the Cross-Analysis, a range of vulnerabilities can be identified, classified by severity level, that reveal systemic gaps in governance, infrastructure, and social inclusion.

Among the most critical risks are weak cybersecurity capacities, the growing use of AI technologies by organized criminal networks, and the absence of regulatory clarity regarding accountability in AI-related harms.

Serious gender-related threats exist, such as digital violence and the persistent exclusion of women and marginalized groups from AI development processes. In parallel, environmental impacts linked to AI—such as unregulated energy consumption and pressure on water resources—are noted as emerging high-risk areas due to their lack of alignment with sustainable development goals.

Medium-risk areas point to structural limitations, including lacking or fragmented data governance frameworks, the lack of explainable AI systems, and the overreliance on imported technologies. These issues are compounded by a disconnect between educational offerings and the skills required for an evolving AI-driven economy. The digital divide, inaccessibility for people with disabilities, and the absence of context-sensitive regulation further limit equitable access and participation.

A coordinated regional effort to strengthen legal and institutional mechanisms is critical, address inequality, and embed environmental and human rights considerations into AI governance. Building more robust, inclusive, and transparent AI ecosystems is essential to ensuring that technological progress does not exacerbate existing vulnerabilities.

TABLE 33. RISK AREAS

Area	Risk Level	Description
Cybersecurity breaches	HIGH	Rapid increase in cyberattacks with underdeveloped national defenses and legal frameworks. Lack of secure infrastructure and human capacity.
Digital gender violence	HIGH	Prevalence of harassment, deepfakes, and identity theft with weak or non-existent legal protection. Weak enforcement capacity.
Underrepresentation in AI	HIGH	Women and minorities are significantly underrepresented in the AI sector, underrepresentation is evident in teams and datasets.
AI reinforcing social inequalities	HIGH	AI risks exacerbating existing socioeconomic, gender, and racial inequalities if unaddressed and the opportunities are not created.
Automation-driven job displacement (esp. women)	HIGH	Jobs predominantly held by women are at high risk of being automated without sufficient protections. This will increase gender gaps.
Environmental impact of AI (energy use, water resources)	HIGH	Rising energy use from data centers and AI operations with limited sustainability policies. Pressure for water resources may increase social unrest
Lack of AI Accountability & Liability Mechanisms	HIGH	Lack of clear institutional responsibility or judicial mechanisms for addressing AI harms and provide accountability and liability.
Surge of AI tools used in service of Organized Crime groups.	HIGH	Organized Crime has the resources to acquired AI tools and Human resources to leverage its potential in enhancing operations thorough out the Region. Lack or regional synergy for counterbalance.
Low data governance capacity	HIGH	Fragmented infrastructure and governance frameworks reduce effectiveness of data-based decision-making.
Limited AI explainability and transparency	HIGH	Nonexistent possibility of explainability mechanisms for foundational models in the region since none is developed in the region with no jurisdiction for extraterritorial capacity.
Educational system misalignment with AI economy	HIGH	Education systems lag behind in adapting to AI skill demands, especially in public institutions.
Limited access to AI tools in rural areas	HIGH	Digital divide persists in rural and low-income areas, hindering equitable AI benefits.
Use of biased AI models	HIGH	Locally deployed AI may reinforce bias due to non-contextual or imported training data.
Absence of proportionality in AI regulation	HIGH	Several countries lack proportional AI regulation tied to risk and human rights impact.
Inaccessible AI for persons with disabilities	HIGH	No public AI frameworks or strategies address accessibility for persons with disabilities.

CHAPTER VII

7. CASE STUDIES

This chapter presents a series of relevant case studies illustrating the concrete unfoldment of AI in the region, highlighting the critical vulnerabilities of AI in Latin America and supporting the arguments developed throughout the research.

7.1. CASE STUDY: LATIN AMERICA—A 5G BATTLEGROUND IN THE U.S.–CHINA GEOPOLITICAL RIVALRY

The trajectory of 5G development in Latin America reveals significant opportunities and structural limitations. While the region possesses substantial growth potential, it lacks the internal technological capacity to independently drive 5G innovation. This deficit has been addressed primarily through international bidding processes and foreign investment—especially from China—thereby intensifying geopolitical tensions with the United States. Simultaneously, digital inequality and chronic underinvestment in R&D obstruct equitable infrastructure expansion.

5G AS A STRATEGIC ENABLER

Fifth-generation mobile networks (5G) provide the backbone for next-generation AI and digital services. Unlike previous generations, 5G supports ultra-fast data transfer, extremely low latency, massive IoT connectivity, and edge computing capabilities—crucial for real-time applications in smart mobility, urban planning, and healthcare.

Statista estimated that by 2023, Latin America would approach nearly 1 billion connected devices. However, the digital divide persists, particularly in rural and underserved urban areas, where unreliable broadband limits the region's ability to harness emerging technologies.

TABLE 34. 5G IN LATIN AMERICA: CURRENT STATUS (2025)

Country	5G Status	Auction Status	Providers
Argentina	Initial Deployment	Auctioned in 2023	Huawei (China), Ericsson (EU)
Brasil	Active Deployment	Auction in 2021	Huawei (China), Ericsson (EU), Nokia (EU)
Chile	Active Deployment	Auction in 2021	Huawei (China), Ericsson (EU), Nokia (EU)
Costa Rica	Upcoming Deployment	Auction planned for 2025	Awaiting Auction
El Salvador	Planning Stage	Auction date pending	Awaiting Auction
Mexico	Active Deployment	Auction in 2021	Huawei (China), Ericsson (EU), Nokia (EU) AT&T (US)
Honduras	Planning Stage	Auction date pending	Awaiting Auction

Sources: GSMA Intelligence (2023), Statista (2024)[76]

A key structural constraint is that Latin America has no indigenous 5G suppliers; all equipment is imported, increasing dependency on foreign vendors and exposing the region to geopolitical pressures.

At the Geopolitical Crossroads: U.S. vs. China

Latin America is caught in an intensifying geopolitical rivalry between the U.S. and China. The U.S. aims to preserve technological leadership, while China expands its influence through the Belt and Road Initiative (BRI), backed by institutions such as the China Development Bank and EXIM Bank. Much of this engagement targets sectors critical to AI—namely mining and digital infrastructure.

U.S. efforts like the "Build Back Better World[77]" initiative which presented itself as an opportunity for Latin America aiming to boost infrastructure investment in low- and middle-income countries (White House, B3W Fact Sheet), unfortunately have lacked follow-through, and has been revoked. while China's state-supported model has offered immediate, large-scale investment. In this context, telecommunications infrastructure has become a strategic front.

Security Concerns and Political Pressures

Washington has pressured regional governments to exclude Huawei and ZTE, citing national security risks tied to potential espionage via Chinese-built networks. The U.S. has imposed bans on Huawei, placed it on the Entity List, and restricted access to semiconductors and software. Allies like the U.K., Canada, and Australia have taken similar steps (Berman, Maizland, & Chatzky, 2023).

Huawei has repeatedly denied espionage allegations and claims Western systems suffer from more significant security flaws. Its affordable pricing and rapid deployment capacity remain appealing, especially for budget-constrained governments. According to Wang and Fu (2022), the U.S. has politicized Huawei's role, complicating Latin America's ability to adopt a neutral technology procurement policy.

Huawei and its European counterparts—Nokia and Ericsson—are the dominant 5G suppliers across the region. Huawei alone operates in over 170 countries, serves 3 billion users, and provides infrastructure that covers more than 50% of Latin America's population (Wang & Fu, 2022; Berman et al., 2023).

Despite U.S. opposition, countries like Brazil, Argentina, and Chile continue engaging with Huawei, while others—such as Costa Rica—align more closely with U.S. positions.

Recent Developments: U.S. Diplomatic Pressure

During a press conference in February 2025[78], U.S. Secretary of State Marco Rubio praised Costa Rica for blocking Chinese firms from public 5G tenders, citing threats to data privacy and national sovereignty:

"When you confront companies that are not secure, backed by governments like China, that threaten, sabotage, and coerce—you need to be firm. Costa Rica deserves support for responsibly building secure 5G infrastructure."

Rubio also warned of consequences for individuals undermining U.S. strategic interests.

Several Costa Rican legislators have had their U.S. visas revoked shortly after the visit. Both had publicly criticized Costa Rica's decision to exclude Chinese firms from its telecommunications projects. This move

---

[76] https://www.statista.com/statistics/1246093/number-5g-networks-latin-american-countries/

[77] https://g7.utoronto.ca/summit/2021cornwall/210611-whitehouse-b3w-launch.html

[78] https://www.state.gov/secretary-of-state-marco-rubio-and-costa-rican-president-rodrigo-chaves-robles-at-a-joint-press-availability/

sparked controversy and raised concerns about overreach and the diplomatic fallout for U.S.–Costa Rica relations.

Strategic Dilemmas for Latin America

Latin America faces three strategic options—each with significant trade-offs:

1. **Align with the U.S.**: Exclude Huawei to secure Western support but risk losing Chinese trade and investment.
2. **Align with China**: Benefit from cost-effective deployment and continued investment but provoke U.S. backlash and security scrutiny.
3. **Strategic Neutrality**: Pursue a multi-vendor approach with rigorous cybersecurity protocols. While potentially optimal, this path demands strong institutions and regional coordination.

The future of 5G in Latin America is inextricably tied to global power competition. Vendors, protocols, and alliances are also decisions about sovereignty, development, and digital futures. Latin America must strengthen its institutions, promote regional coordination, and build technical capacity to mitigate risk while asserting strategic autonomy. The choices today will determine the region's position in the global digital economy for decades.

7.2 Case Study Argentina-Worldcoin

Since January of 2023, the Argentine government has scrutinized Worldcoin79, a San Francisco-based company, for its biometric data collection efforts. These involve face and iris scans conducted across various regions of the country.

The Argentinian Agency for Access to Public Information (AAIP) has demanded clarity from the company regarding its operations, the types of data processed and their intended uses. Concern arose after news broke that over 100,000 individuals provided their biometric data in exchange for cryptocurrency valued at around $50 (USD).

Despite government actions, Worldcoin's operations have continued to expand in a country plagued by a 288% inflation crisis and significant economic instability. The mechanisms they use are difficult to combat, relying on a network of intermediaries who earn a commission from every iris they scan, so the incentive is to hunt for as many irises as possible. Most of the Costumers are looking for an additional source of income to make it through the month.

[79] https://world.org/es-es

FIGURE 2. A WORLDCOIN IRIS SCANNING POST

Un puesto de escaneo de iris de Worldcoin en Pinamar, durante el verano en 2024
Marcelo Manera - LA NACION

Source: La Nacion Argentina

Testimonies abound, such as the case of Lorena Potosí, a seamstress, who shared her experience with Aljazeera News (2024) said: “There is almost no work, “Maybe next week I’ll make some money” She got her iris scanned in a subway station. “No one told me what they’ll do with my eye, but I did it out of need.” Potosi lives on government support of $95 and saw this as an opportunity to earn some additional money.

This is not Worldcoin's first data collection endeavor. The global south is a territory of great interest for companies like Worldcoin. The company has also operated in Indonesia, Sudan, and Kenya for recruitment, data collection, and testing drives. Currently Worldcoin operates in several countries in Latin America such as Mexico, Chile, Colombia, Ecuador and Brazil.

Worldcoin has aggressively pursued its biometric data collection campaign this year in Latin America, drawing significant scrutiny from experts and regulators who have raised alarms about the risks associated with such practices.

In Colombia, authorities have issued a warning to the Worldcoin Foundation, a subsidiary of Worldcoin registered in the Cayman Islands, for potentially violating the National Data Protection Law. The company initiated its biometric data collection through 25 centers known as "Orbs" across the country.

While Latin American authorities have generally reacted unfavorably to Worldcoin’s operations, enforcement mechanisms for data protection laws remain weak. Additionally, monitoring and controlling the establishment of "Orbs" have proven challenging, making it difficult to effectively regulate their activities.

Who is Worldcoin?

Worldcoin, recently rebranded as World Network (to represent a broader vision), is a cryptocurrency and digital identity company co-founded in 2019 by Sam Altman, CEO of OpenAI, along with Alex Blania and Max Novendstern. Its primary aim is to authenticate humans online.

Worldcoin operates through various branches and subsidiaries. Tools for Humanity[80] (TfH), a company based in San Francisco and Berlin, is the branch responsible for developing the technology and

[80] https://www.toolsforhumanity.com/

mechanisms behind this authentication process. Interestingly, Germany is the only country in the Global North where Worldcoin currently operates, following a ban on its operations in Spain. We will delve deeper into this later.

The concept of Worldcoin stems from Sam Altman's vision, articulated in a manifesto published in 2021 titled Moore's Law for Everything. The manifesto reflects on the rapid pace of technological advancements, the immense wealth they generate, and potential ways to distribute this wealth more equitably. Altman's interest in Universal Basic Income (UBI) predates this vision, as he had already expressed curiosity about the concept as early as 2016 as a response to concerns that automation will replace jobs. In Altman's vision, this UBI would be distributed using their own cryptocurrency (WLD) and to implement it, a universal digital identity based on biometric information is essential.

BIOMETRICS: A HISTORY OF IDENTIFICATION AND CONTROL

Biometrics has played a significant role throughout history in identifying individuals and verifying identities. In ancient times, fingerprints and handprints were used as seals and signatures. In the 1800s, Alphonse Bertillon developed a system of anthropometry, which measured physical features to identify criminals. By 1892, Sir Francis Galton had introduced the first fingerprint classification system.

Biometrics refers to measurable physical characteristics used to recognize or verify an individual's identity. Examples include fingerprints, facial patterns, iris scans, voiceprints, and even gait. Biometric systems analyze these unique traits to grant access, verify identities, or enhance security across various applications. Today, biometrics are integrated into everyday life, from financial transactions to border control. Chances are, every time you unlock your phone, you are utilizing a biometric system.

In 1960, Woodrow W. Bledsoe's research pioneered the first semi-automated facial recognition system. As Stephanie Dicks explains in her article "The Standard Head," Bledsoe's work, based on algorithmic computation, marked one of the earliest advancements in computer-automated facial recognition globally. However, Bledsoe's algorithm had significant limitations, including a lack of accuracy and inherent racial biases, which raised concerns about its efficacy. Despite these shortcomings, facial recognition technology has been consistently applied in areas such as surveillance and prison control. Nevertheless, facial recognition has proven inadequate as a reliable tool for digital identity.

Worldcoin positions itself as an entity striving to forge the most extensive digital identity and financial network globally, promising ownership for all its users. Its goal, as stated on its website is to ensure universal access to the global economy, transcending national borders and socioeconomic backgrounds and differentiate humans from bots and AI algorithms in a world increasingly dominated by artificial intelligence.

To that end, the company has created a digital identity based on biometric traits (World ID) that is linked to a financial network using the cryptocurrency Worldcoin token (WLD) operated through an app known as World App. To access this network, one must prove that they are a human through a "proof of personhood," which is obtained through iris scans.

IRIS SCAN: A RELIABLE DIGITAL IDENTIFICATION

'One of the most wonderful things in nature is a glance of the eye; it transcends speech; it is the bodily symbol of identity.'– Ralph Waldo Emerson

With advancements in computing power and artificial intelligence, biometric methods such as iris scanning have emerged as far more accurate and reliable, showcasing the evolving nature of biometric technologies. The iris, a pigmented membrane suspended within the eye between the cornea and the lens is the most valuable biometric data, as it allows for identifying a person with impeccable precision and consistently over time. This type of information ensures reliable and long-lasting recognition, making it an essential tool for identity authentication.

Before iris recognition occurs, the iris is located using landmark features. These unique characteristics and the distinct shape of the iris allow for image digitization, feature isolation, and data extraction.

Unlike passwords, biometric information is unique to each individual and irreplaceable. If stolen, it cannot be reset or changed, increasing the risks of impersonation. This makes security throughout the process paramount to safeguarding personal information and privacy.

How is Biometric Information Collected?

The process begins by collecting biometric data through the scanning of both the face and the iris. Once collected, the data is translated into a digital template or hash, which must be securely stored and encrypted.

Based on publicly available information, Worldcoin follows a similar process with some modifications. The system operates with two main components: the "Worldcoin Wallet" and the "Orb" camera.

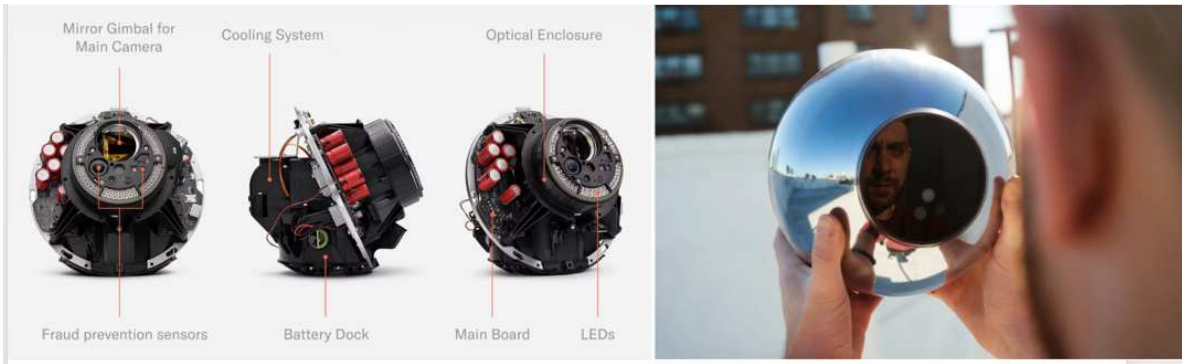
All users of Worldcoin must download an app that functions as a digital wallet (Worldcoin Wallet). In its initial phase, the app generates a key pair, enabling users to sign in to cryptocurrency apps, mobile apps, and websites securely.

FIGURE 3. WORLD WALLET/WORLDCOIN APP

Source: World.org

The Orb is the small and spherical device used to collect biometric data. Worldcoin recently unveiled an updated version of its Orb, which boasts five times the AI performance of its predecessor. Powered by Nvidia's Jetson chipset, the Orb scans both the face and the iris, creating a QR code containing the user's public key generated in the first phase by the app.

FIGURE 4. IMAGE 4. CAD OF THE "ORB" COMPONENTS.



Source: World.org "The Orb". Photo: Karsten Moran For Fortune Magazine (2024)

The system verifies that the user is a real, living person and ensures that their iris does not match that of any other user. Once verified, the biometric image is converted into a string of numbers, which generates a World ID. This World ID is stored on the user's phone, providing a secure and decentralized identity.

CAN WORLDCOIN GUARANTEE SAFETY?

Biometric databases require state-of-the-art encryption techniques to prevent unauthorized access and misuse. Even in the event of a breach, robust encryption can render biometric data indecipherable and unusable. However, Worldcoin has faced significant scrutiny and has been suspended or banned in countries such as Spain and Kenya due to security and privacy concerns. Questions persist about how the company ensures the security and proper handling of the biometric information it collects.

Worldcoin claims to employ advanced encryption, including "zero-knowledge proofs" (ZKP), a cryptographic protocol that enables one party to verify information without revealing sensitive details. This approach allows the verifier to confirm the truth of a statement without accessing the underlying data.

According to Tiago Saga, Head of Product & Design at Tools for Humanity—a sister company responsible for developing tools like the "World Wallet" and the "Orb" used in the verification process—Worldcoin's systems are among the most secure available. Saga asserts that the Orb, the device used for biometric scanning, is more secure than most social media platforms. Tools for Humanity has raised $115 million in a Series C funding round led by Blockchain Capital and has convinced over 5 million people worldwide to participate in biometric scans using the Orb.

Despite these claims, privacy and data experts, particularly in Latin America, remain skeptical. Daniel Monestel, in an interview with Deutche Welle (DW), emphasized that Worldcoin's publicly available information fails to demonstrate how it guarantees privacy. A Bosch Foundation research on 2022 about digital wallets concluded that It is a myth that blockchain-based systems are wholly privacy preserving (Digital Wallets and Migration Policy: A Critical Intersection).

Concerns include the lack of transparency regarding the storage and retention of biometric data (such as facial and iris scans), unclear policies on whether third parties may access this data, and insufficient details on when and how identifiable user data is deleted.

While Worldcoin markets its system as secure and innovative, the absence of clear, transparent policies undermines its assurances of privacy and data security. In April 2022, Eileen Guo and Adi Renaldi published an article in the MIT Technology Review titled "Deception, Exploited Workers, and Cash Handouts: How Worldcoin Recruited Its First Half a Million Test Users," which criticized Worldcoin's data collection practices. Their investigation revealed discrepancies between the company's privacy promises and user experiences, including misleading advertising, excessive data collection, and failures to ensure informed consent.

These findings, coupled with ongoing concerns from experts, highlight significant challenges in reconciling Worldcoin’s privacy claims with its operational practices.

Worldcoin and Blockchain: Worldchain, a Fintech Solution

The Worldcoin project is currently presented as an altruistic endeavor, with Universal Basic Income (UBI) as an ambitious but uncertain goal. Significant funding has been secured to develop the "Orb," a device central to Worldcoin's operations. The launch of a newer version in October this year indicates increased investment and greater efficiency in production costs. With the advancement of high-tech tools by Tools for Humanity (TfH), Worldcoin aims to bridge the gap between proof of personhood (identity verification) and financial mechanisms like the WLD token.

Worldcoin has acknowledged flaws in its system, yet continues to refine its infrastructure. The WLD token, an Ethereum-based cryptocurrency, leverages the security of the Ethereum blockchain to ensure robust infrastructure and scalable identification mechanisms. By integrating tools such as the Orb and the World ID, Worldcoin is striving to create a reliable and decentralized identification system. If successful, it could establish a transformative intersection between blockchain technology and digital identity.

Worldcoin's vision extends beyond identity verification. It seeks to redefine the fintech landscape by expanding operations globally, positioning itself as a universal decentralized financial network. In this scenario, the WLD token could emerge as a universal currency, potentially altering the dynamics of global finance and digital identity. Other expets has suggested that worldcoin could be creating a Global biometric database with very little oversight.

Yet, critical questions remain: What is the true business model or ultimate objective of Worldcoin? One thing is certain: In a growing market of biometric technology, having a cost-efficient and scalable system ready could open abundant opportunities for market expansion. Worldcoin need the largest possible number of irises scanned to ensure the training of its AI neural network to recognize irises and detect fraud.

In a statement provided to MIT Review81 (2022), the company said: “It is important to emphasize that we collect data not for the purpose of profiting from it or surveilling our users, like many other tech companies out there. Rather, our goal is to use the data for the sole purpose of developing our algorithms to minimize fraud and enhance user privacy.”

Securing a sufficient number of people willing to provide their biometric data is crucial, and it seems their data collection campaign is focused on Latin America. But what makes Latin America so interesting for Worldcoin?

Biometric Collection in Latin America: A new Form of extractivism?

“A friend told me it was a way to make bank without investing or paying a deposit,” Camilo Herrán, a college student in Colombia, told Rest of World magazine[82].

Extractivism refers to the exploitation of resources and knowledge from marginalized or less empowered communities, often carried out without fair compensation or reciprocity. Originally conceptualized in the 1990s in Latin America to describe historical resource extraction, the term has since

[81] https://www.technologyreview.com/2022/04/06/1048981/worldcoin-cryptocurrency-biometrics-web3/

[82] https://restofworld.org/

evolved to encompass broader forms of exploitation, including epistemic, financial, labor, and ontological extractivism.

Latin America presents a particularly compelling geography for companies like Worldcoin for several reasons. The lack of robust national regulations, combined with the economic vulnerability of many populations, creates an environment where such controversial practices can thrive unchecked.

Data Protection Laws Without Extraterritorial Reach and Limited Enforcement Capacity

"Seeing that [iris scans have] been banned in European countries, shouldn't we be trying to stop it, too?" Javier Smaldone, a software consultant and digital security expert, told Rest of World magazine[83] (restofworl.org)

Most countries in Latin America have data protection laws in place, and activities like biometric data collection fall within the scope of these regulations. Countries such as Argentina, Mexico, Colombia, and Chile have initiated investigations against Worldcoin and TfH for alleged violations of data protection laws and failure to ensure informed consent in their data collection processes. However, these investigations are often slow, cumbersome, and hindered by the limited enforcement capacity of governments.

"Every piece of data collected in Colombia must comply with Colombian law." Grenfieth Sierra, the SIC's data protection delegate. Superintendency of Industry and Commerce (SIC), which regulates personal data protection in Colombia.

Another significant concern among experts is whether TfH will establish a local branch in these countries or operate solely from its headquarters in Germany and the U.S.

"You have to look into whether they will be operating in Colombia from 'a shell,' and if this will … make it impossible for authorities to, in practice, enforce any measures [against them]," said Juan David Gutiérrez, a technology regulation expert and professor at the University of the Andes in Bogotá, in an interview with Rest of World magazine.

General Use of Biometric Information to Access Services: The use of biometric data is steadily increasing across Latin America in both the public and private sectors. This growth is primarily driven by the security and border control industries. For example, Colombia implemented iris scan biometrics for immigration purposes at El Dorado Airport as early as 2018.

This growing interest in biometrics is unfolding amidst rising concerns about security and the simultaneous adoption of technologies such as mobile phones and banking services. These services often rely on biometric recognition, such as facial recognition, which has helped familiarize the population with this technology.

Low Digital and Cybersecurity Literacy: While familiarity with technology is growing in Latin America, there is still a lack of understanding about what digital information entails, the implications of its use, and the rights individuals have regarding their data.

Although all Latin American countries have data protection laws, enforcement capacity remains weak. Additionally, gaps in the regulatory framework limit governments' ability to act against companies without legal representation in their territories. This issue is evident in cases like Worldcoin, where enforcement becomes particularly challenging.

Users in Latin America Join Out of Necessity: The Worldcoin company funds local subcontractors to identify and onboard low-income customers. The majority of people in Latin America who have

[83] https://restofworld.org/

provided their data in exchange for $50 in WLD tokens are those facing economic hardships. Many of the countries where Worldcoin has established branches are experiencing severe economic crises, such as Argentina, or have high poverty rates, like Guatemala. Additionally, vulnerable populations, such as migrants, see Worldcoin as an opportunity to earn some money and gain access to a digital wallet.

The Intersection of Digital Wallets and Migration: For many migrants in Latin America, the United States is the ultimate destination. The migration process, often undertaken overland, can take months to complete. During this journey, digital wallets offer a practical means for receiving funds and making payments.

Digital wallets are increasingly viewed as a solution to the limitations of traditional financial and identity systems, primarily because they are accessible via mobile phones.

Research on digital wallets and migration by the Bosch Foundation highlights initiatives like UNICEF's Leaf project84, which uses blockchain technology to provide low-income, tech-savvy migrants with cost-saving, independently managed financial tools. However, the research also examines experimental ventures such as Worldcoin, noting that the company "offers people untested and meaningless cryptocurrencies." While claiming to promote wealth redistribution and financial inclusion for marginalized groups, including refugees, such schemes raise significant concerns regarding privacy and data protection. Moreover, implementation flaws could have harmful consequences for the socio-economic well-being of individuals.

“Every piece of data collected in Colombia must comply with Colombian law.” Grenfieth Sierra, the SIC’s data protection delegate. Superintendency of Industry and Commerce (SIC), which regulates personal data protection in Colombia.

Another concern among experts is whether TfH will have a local branch in the country or if it will run the operation from its headquarters in Germany and the U.S. “You have to look into whether they will be operating in Colombia from ‘a shell,’ and if this will … make it impossible for authorities to, in practice, enforce any measures [against them],” Juan David Gutiérrez, a technology regulation expert and professor at the University of the Andes in Bogotá, told Rest of World.

The Next Frontier and Building Public Trust: To achieve Public Interest Technology and for artificial intelligence (AI) to be a tool worthy of public trust, both companies and the sector that employ these technologies must address the ethical issues arising from ongoing power imbalances between the Global North and Global South that inform data collection practices and shape individual rights.

Ethical considerations for AI use across borders must extend beyond creating algorithms that are fair, transparent, robust, and explainable to general publics. These considerations should be integral to how AI is developed and deployed from the start.

The rise of AI and the case of Worldcoin prompts us to rethink technology's societal impact, one that should provide equitable services that cater to unique community needs. A truly global AI viewpoint necessitates the inclusion of a broader diversity of voices at the table. Currently, the Global South is consistently underrepresented in AI-related forums.

Countries and organizations that have traditionally led AI discourse must ensure the inclusion of the Global South in discussions, roundtables, and working groups on AI, as well as in advisory capacities within international bodies like the OECD and the United Nations, where only 7 out of 37 members of the UN AI Advisory Body are from or represent the Global South. As technologies continue to rapidly change, the need for inclusive and diverse representation is urgent to shape global AI regulatory standards.

[84] https://www.unicef.org/innovation/InnovationFund/blockchain-financial-inclusion-cohort

7.3 Venezuela & GenAI — Between Disinformation, Innovation, and Protection

Venezuela's information ecosystem has been deeply transformed by state-driven disinformation campaigns. Since 2009, the government has employed bots and automated accounts to manipulate public discourse on social media, harass opposition figures, and fabricate artificial trends. According to the *Reporters Without Borders* (RSF) *Press Freedom Index 2024*[85], at least eight journalists remain detained in Venezuela.

The 2024 presidential elections served as a stark example of how digital manipulation reinforces authoritarian electoral processes. Since Nicolás Maduro assumed power in 2013, he has systematically dismantled press freedom while intensifying the policy of "communication hegemony" initiated by Hugo Chávez. Venezuela remains one of the most restrictive environments for the press in the Western Hemisphere, with policies that threaten the existence of independent journalism (*RSF, 2024*).

Rather than fostering independent media, the regime has intensified its digital manipulation strategy, deploying automated networks to dominate narratives across digital and social platforms. The Digital Forensic Research Lab (DFRLab) characterizes this as a "tracking network" — a system that captures population-wide data and monitors specific individuals classified as strategic targets (*Puyosa et al., 2024*).

The collapse of traditional media, driven by censorship and financial constraints, has forced independent journalism to migrate to platforms such as WhatsApp, newsletters, and social media. The economic crisis following the 2015 collapse of oil revenues created a fertile ground for the government to consolidate control over information, while independent media struggled to survive. As *RSF (2024)* notes, this period marked a sharp contraction in the country's pluralistic media space.

Although digital platforms have become a vital source of information, the regime has weaponized this shift to amplify disinformation. The government has deployed coordinated digital harassment against journalists, NGOs, and human rights defenders, including the use of troll farms, bots, and fringe websites disseminating false or manipulated content.

Despite constitutional guarantees of communication privacy, Venezuela lacks a data protection law. This absence leaves citizens without safeguards over the collection and use of their personal information. Combined with censorship and surveillance, the lack of data regulation has entrenched an authoritarian information control model in which access to reliable information is increasingly restricted.

2024 Elections and Disinformation Surge

Following the 2024 elections, social media platforms from unverifiable information sources were inundated with fabricated headlines such as:

- *"The U.S. Secretary of Defense announced that the military is ready to enter Venezuela and overthrow Nicolás Maduro's dictatorship."*
- *"Joe Biden advised Edmundo González Urrutia, Maduro's opposition candidate, to accept his defeat to Maduro."*

FIGURE 5. DISINFORMATION ON SOCIAL MEDIA-VENEZUELA CASE STUDY

[85] https://rsf.org/en/country/venezuela

Source: El País (2023)

As reported by El País in its article "They are not journalists, they are avatars: Chavismo promotes propaganda created with artificial intelligence"[86] (Singer, 2023), none of these claims were verified by official sources, yet their widespread dissemination illustrates how digital disinformation is strategically used to manipulate political narratives.

Digital Avatars: Innovation, Protection, and Propaganda

While the dangers of Generative Artificial Intelligence (GenAI) in creating false content are well documented, its potential to protect journalists and preserve press freedom in repressive regimes is a less explored but equally critical development.

In 2023, pro-government YouTube channel *House of News en Español* began broadcasting fabricated reports promoting Venezuela's economic recovery. These segments featured avatars such as "Andy," "Thomas," and "Emma" — AI-generated figures created using Synthesia technology, designed to mimic the appearance and tone of international news anchors (*Singer, 2023*). Presented in multiple languages, these fabricated reports were disseminated across platforms including TikTok and X (formerly Twitter), further blurring the line between journalism and propaganda.

[86] https://elpais.com/internacional/2023-02-20/no-son-periodistas-son-avatares-el-chavismo-impulsa-propaganda-hecha-con-inteligencia-artificial.html

FIGURE 6. AI AVATARS ANDY & THOMAS.

Source: YouTube Channel "House of News"

Meanwhile, legitimate media organizations in Latin America are also experimenting with GenAI. In 2024, *Grupo Fórmula,* a Mexican media company specializing in radio broadcasting, introduced "*Nat*," the region's first AI-generated news anchor. While designed for efficiency and accessibility, this innovation has sparked debate on the ethical boundaries between automation, editorial responsibility, and manipulation.

"OPERACIÓN RETUIT": GENAI AS A SHIELD AGAINST CENSORSHIP

In response to growing threats to journalist safety, the initiative *Operación Retuit*—developed by *Connectas* [87] a journalistic alliance between 2 different organization (Venzuela Vota and #LaHoraDeVenezuela) seeks to protect journalists from repression by using digital avatars to present news from international and Venezuelan media outlets, as its page states *"Operacion Retuit is a strategy that originated to avoid censorship and repression of journalists in Venezuela. It uses Artificial Intelligence"* Operación Retuit has deployed GenAI avatars as protective intermediaries. The virtual presenters "La Chama" and "El Pana" deliver news while clearly identifying themselves as artificial figures to avoid misleading the public. The initiative's aim is to ensure the dissemination of accurate information while shielding real journalists from persecution (*Connectas, 2024, cited in The Wire*).

---

[87] https://www.connectas.org/especiales/operacion-retuit/index-en.html

FIGURE 7. LA AND EL PANA, AVATARS CREATED WITH GENAI.

Source: Connectas.org

While GenAI offers innovative tools to circumvent censorship, it also presents urgent regulatory challenges. As the Maduro regime continues to weaponize disinformation, Venezuela illustrates the dual-edged nature of GenAI: it can simultaneously empower civic resistance and serve authoritarian agendas.

This raises critical questions for policy and governance: How can GenAI tools be regulated to prevent their misuse in propaganda while preserving their protective potential for journalists and civil society?

Ensuring a balanced and transparent regulatory framework will be essential to prevent GenAI from becoming a tool of oppression, while enabling its use in defending press freedom and truthful communication in closed or hostile environments.

CHAPTER VIII

8. CONCLUSIONS AND CRITICAL VULNERABILITIES

The cross-analysis process revealed a set of interrelated conclusions that frame the ethical, institutional, and structural context in which Latin America's AI vulnerabilities take shape. At the core lies the persistence of structural inequality—across gender, geography, class, and disability—which underpins and amplifies the uneven impacts of AI on education, labor, rights, and access. This foundational challenge is exacerbated by the failure to meet fundamental ethical imperatives around equity and inclusion (mostly gender and rural inclusion). Without targeted strategies to integrate vulnerable groups, the principles of fairness, accountability, non-discrimination, and transparency remain unfulfilled and challenging.

Governance systems across the region suffer from weak institutional and regulatory capacity. Fragile institutions, underfunded oversight bodies, and enforcement gaps obstruct the implementation of ethical frameworks and the protection of fundamental rights. While regional collaboration is often invoked as essential for effective AI governance, particularly in setting standards and addressing transboundary impacts, it remains aspirational mainly and lacks operational mechanisms.

The absence of meaningful participation further undermines legitimacy and trust. Participatory processes are frequently symbolic or exclusionary, leaving critical decisions in the hands of unrepresentative actors. In parallel, fragmented approaches across sectors have revealed the urgent need for coordinated responses that bridge AI ethics' technical, legal, and social dimensions.

Compounding these issues is the growing influence of disinformation and low digital literacy, which erode public trust in democratic institutions and AI technologies. Rather than being defined by specific regulatory gaps, the region's AI landscape is characterized by structural absences—infrastructure, oversight, human capital—that signal a strategic vacuum. Within this fragmented landscape, ethical principles do not operate in isolation; violations of one domain often ripple into others, making protecting human rights the necessary anchor for all AI-related governance.

Finally, sustainability remains collateral, mainly despite growing attention to data governance and security. Environmental and resource considerations are seldom integrated into AI policy frameworks, even as infrastructure expansion increases strain on energy systems and ecosystems.

These conclusions, drawn from cross-analysis and the key insights emerging from each analytical table, provide the foundation for identifying the region's most pressing gaps and systemic weaknesses. The case studies included in this paper offer concrete evidence that many ethical vulnerabilities are not hypothetical—they are already unfolding, and their progression is accelerating even faster in the least prepared countries, further fragmenting the region's capability to coordinate as an ecosystem for innovation. This reality calls for immediate attention and coordinated action. It underscores the urgency of national-level responses and collective regional efforts to build scale, coherence, and governance capacity.

On this basis, the research identifies ten critical vulnerabilities that define Latin America's exposure to harm in the age of artificial intelligence.

These are the 10 critical vulnerabilities identified and analyzed as an outcome of the research:

1. Expansion of Surveillance and Social Control

Building on conclusions regarding weak institutional and regulatory capacity, as well as cross-analysis findings that highlight the growing interest in surveillance technologies, current trends reveal a troubling trajectory. As illustrated in Table 26: *Principle of Human Rights / Right to Freedom of Thought*, the widespread deployment of Pegasus spyware across multiple countries exemplifies the erosion of privacy and the unchecked use of invasive tools. Similarly, Table 18: Principle of Security documents the rapid spread of facial recognition technologies in the region (Venturini & Garay, 2021).

As Almeida, Shmarko, and Lomas (2022) argue, the unchecked expansion of facial recognition technologies—often implemented without transparency, oversight, or public accountability—can result in significant human rights violations, especially when used as tools for social control.

The case study on Venezuela further emphasizes how the proliferation of surveillance and control technologies in weakly regulated environments raises serious ethical and legal concerns. Regional examples include biometric voter registration in Mexico and predictive policing programs in Chile. While tools like biometric data collection and facial recognition offer technological sophistication, they pose serious threats to individual freedoms and fundamental rights, particularly in countries with authoritarian tendencies where such technologies are deployed in politicized and opaque contexts.

The case study on Argentina also illustrates how easily biometric data can be collected, despite the existence of national laws prohibiting such practices—highlighting the gap between legal protections and their enforcement

2. Proliferation of Misinformation and Disinformation

Building on the conclusions regarding disinformation and the region's low levels of digital literacy—as referenced in Table 26: *Principle of Human Rights / Right to Freedom of Thought*, particularly in the areas of AI-generated propaganda and public opinion manipulation—it is evident that disinformation is increasingly dominating social media platforms across Latin America.

The case study on Venezuela highlights how disinformation has become a consolidated tool of statecraft, systematically used by the government to control narratives and suppress dissent. In addition to the findings presented in this paper, the Latin American Center for Investigative Journalism (CLIP) released its 2024 Digital Mercenaries series, a cross-national investigation into electoral disinformation networks. These reports document the operations of coordinated "troll farms" across the region, aimed at manipulating public opinion during elections.

A major challenge in Latin America is the region's limited digital literacy and structural gaps in education. Populations with lower levels of media and technological education are more susceptible to believing and sharing false or AI-generated content, often unable to distinguish deepfakes or fake news from legitimate information.

Without robust regulatory frameworks and widespread digital , GenAI content tagging or watermarking and education initiatives, the spread of disinformation continues to erode public trust and weaken democratic governance across the region at a very fast pace.

3. Escalation of AI-Enabled Organized Crime

This critical vulnerability is an open secret in Latin America. The signs are evident: a sharp rise in fraud and scams as outlined in *Table 18: Principle of Security*, growing use of cryptocurrencies and digital wallets, and structural inequality and lack of opportunity—highlighted in *Table 19: Principles of Fairness & Non-Discrimination*—which continue to push many into organized crime.

While a broader regional security analysis lies outside the scope of this paper, it is essential to note that there is increasing evidence in reports and investigations regarding the use of technology by organized criminal groups. According to the U.S. Congressional Research Service (CRS-Reports), Latin American drug trafficking organizations have begun to deploy drones equipped with explosives and surveillance tools to evade law enforcement and attack police and military targets (Beittel, J. S., 2022, June 7). These technological adaptations represent a significant escalation in the region's drug conflict.

Criminal groups also incorporate AI tools to improve fentanyl trafficking, enhance operational planning, and forecast police checkpoint locations. In the BBC News Mundo article *"6 Ways in Which Criminal Groups in Latin America Use Artificial Intelligence"* (Orgaz, C. J., 2024), political security consultant Katherine Herrera Aguilar explains that data analysis enables these criminal networks to identify under-patrolled routes and areas with little to no state presence.

In an interview conducted with a senior security official from Costa Rica's Bureau of Judicial Investigations (OIJ), it was noted that while formal research remains scarce, there is growing concern that gangs use public tools like Google Maps and Waze to access real-time traffic and the use of drones for police checkpoint data, helping them optimize their routes and avoid detection.

Despite growing anecdotal and investigative evidence, there remains a notable absence of systematic research on AI-enabled organized crime in Latin America. This information gap must be urgently addressed through collaborative intelligence efforts and academic investigation to better understand and respond to the evolving threat landscape.

4. Worsening Informality and Precariousness of Labor

Labor informality has long been a structural issue in Latin America, deeply tied to persistent inequality, as shown in *Table 19: Principles of Fairness & Non-Discrimination*. Combined with gender disparities (*Table 20: Principle of Gender Equality*), this creates a particularly vulnerable labor market—particularly seen in Brazil—Many individuals enter platform-based or data annotation work out of economic necessity. For women, the flexibility of remote digital labor often enables them to balance paid work with unpaid care responsibilities for children or the elderly, making such precarious employment a default solution rather than a choice.

The region's weak institutional frameworks, as identified in the conclusions, contribute to inadequate enforcement of labor standards. This highlights the urgent need to revise and modernize legal protections to reflect today's realities, especially in relation to digital labor platforms and the gig economy. A "gig" is typically a short-term, flexible task or job where individuals operate as freelancers or temporary workers without formal employment protections. The lack of effective regulation to guarantee minimum labor conditions, coupled with limited economic opportunities and sluggish growth, makes Latin America especially susceptible to labor precarity.

Furthermore, *Table 25: Principle of HHRR/ Right to Work & Fair Wages* reinforces the need for proactive policies to prevent widespread displacement due to automation and AI. Workers in high-risk sectors must be supported with training to develop the digital skills necessary for AI to serve as an economic enabler, rather than a force of exclusion. Without such interventions, technological advancement may deepen existing labor vulnerabilities instead of closing them.

5. Deepening Inequalities, Especially Gender and Urban-Rural Divides

This vulnerability is among the most visible in the region today. The concern raised in this paper is that, unless adequate conditions are created to close existing gender gaps—such as those highlighted in *Table 20: Principle of Gender Equality* and *Table 25: Principle of Human Rights / Right to Work & Fair Wages*—women will remain particularly exposed to job profiles at high risk of automation and AI displacement. Given the nature of the sectors where women are overrepresented, it is urgent to develop strategies that equip them with the necessary digital skills to navigate this transition.

Similarly, rural areas face a critical level of vulnerability. As shown in *Table 21: Principles of Accessibility and Inclusiveness*, these areas are increasingly marginalized due to a lack of infrastructure investment, limited digital connectivity, and insufficient access to digital education. If appropriate measures are not taken to close these divides, existing geographic and socio-economic inequalities will likely deepen further.

6. **Heightened Environmental Conflicts over Critical Resources, Particularly Water**

As outlined throughout this paper, Latin America currently lacks the infrastructure needed to develop foundational AI models. As shown in Table 22: *Principle of Sustainability*, the region faces a significant digital divide that requires major investments not only in connectivity (e.g., 5G) but also in high-performance computing (HPC) systems and data centers—technologies that will dramatically increase energy consumption.

This challenge aligns with broader concerns about the intensive energy and water demands of AI infrastructure, particularly during model training and inference. GPUs, which are central to modern AI development, consume substantially more electricity than CPUs. Despite ongoing efforts by the industry to improve energy efficiency, global demand for computing power is expected to rise at unprecedented rates.

Countries such as Chile and Costa Rica, with robust renewable energy matrices, are well-positioned to attract data center investments and expand cloud adoption. However, this will increase pressure on their energy grids and test the resilience and diversification of their clean energy supply.

As indicated in Table 29: *Principle of Environmental Impact*, generative AI technologies are highly resource-intensive. For example: a single ChatGPT query consumes approximately five times more electricity than a basic web search. Data centers consume an average of 2 liters of water per kWh used, primarily for cooling.

GPU shipments to data centers increased from 2.67 million in 2022 to 3.85 million in 2023, highlighting accelerating infrastructure demands.

In addition, the exploitation of critical minerals—essential for AI hardware, batteries, and clean technologies—is itself highly water-intensive, especially during the extraction phase. As global demand for these resources grows, water-stressed regions in Latin America that host these mineral reserves face increasing environmental and social pressure.

Together, these dynamics underscore the urgent need to balance digital infrastructure development with sustainable environmental and water resource management across the region.

7. Entrapment in Geopolitical Rivalries

The development of 5G infrastructure in Latin America as a strategic enabler of artificial intelligence (AI) amid an escalating geopolitical race on AI between the United States and China. While 5G offers transformative potential through high-speed, low-latency connectivity and real-time data processing essential for next-generation technologies, Latin America lacks the technological capacity to deploy such networks independently. Instead, the region relies heavily on foreign vendors—primarily Huawei, Ericsson, and Nokia—exposing it to external political pressures. China has advanced its position through infrastructure investment tied to the Belt and Road Initiative, while U.S.-backed efforts have lacked consistency and follow-through. The current U.S. administration has urged regional governments to exclude Chinese firms like Huawei from 5G tenders, citing security risks. At the same time, countries such as Brazil, Argentina, and Chile have continued to cooperate with Chinese providers.

Meanwhile, as the Case Study A 5G Battleground explains, others, like Costa Rica, have faced diplomatic consequences within its Congress for siding with U.S. strategic preferences. As a result, Latin America confronts three strategic paths: align with the U.S., align with China, or attempt a neutral multi-vendor approach with robust cybersecurity governance. Each option carries trade-offs regarding sovereignty, economic opportunity, and international alignment. The outcome of these decisions will shape the region's digital infrastructure, strategic autonomy, and position in the global AI economy.

8. Erosion of Public Trust and Democratic Institutions

Widespread inequality in Latin America has contributed to a deep erosion of trust in democratic institutions and their ability to address public needs. As disparities grow, confidence in democracy weakens further. It is, therefore, imperative to create inclusive opportunities for all, particularly in areas such as digital education. As shown in *Table 27: Principle of Human Rights / Right to Education*, the region faces significant challenges in providing equitable access to digital learning, especially for marginalized communities.

From *Table 23: Principles of Privacy & Data Protection*, it is evident that any violation of privacy—especially when tied to state surveillance or control—further fuels public distrust. Government-led monitoring systems that lack transparency are perceived as tools of coercion rather than protection, reinforcing skepticism toward institutional benefiance.

As highlighted in Conclusion 3: Weak Institutional and Regulatory Capacity Undermines Governance, when public institutions fail to evolve in response to technological change, their credibility diminishes. Without adapting their mechanisms, staff, and oversight systems to the realities of AI, they risk being unable to integrate these tools ethically or regulate them effectively. This regulatory vacuum deepens perceptions of institutional failure and democratic fragility.

Table 30: Multi-Stakeholder Collaboration and Conclusions, the lack of meaningful participation and stakeholder engagement indicate that without genuine participatory governance, public engagement remains superficial or symbolic. People become alienated from decision-making processes, and policy outcomes risk losing both credibility and legitimacy. The absence of inclusive, representative, and accountable participation renders AI ethics frameworks aspirational but unenforceable.

Finally, as noted in Conclusios, disinformation and digital illiteracy erode trust in AI and Democracy and *Table 26: Principle of Human Rights / Right to Freedom of Thought*, the unchecked spread of disinformation—exacerbated by low digital literacy—undermines democratic processes and public confidence. The proliferation of fake news and deepfakes distorts public opinion, weakens institutional trust, and poses a growing threat to democratic integrity in the digital age

9. Intensification of Technological Dependency and Loss of Sovereignty

Latin America's growing reliance on foreign technologies underscores a critical regional vulnerability. As illustrated in *Table 4: Comparative Number of HPCs in Latin America and Leading Countries* and *Table 5: HPC in Latin America*, the region faces significant infrastructure limitations, particularly in high-performance computing (HPC), which is essential for developing and scaling artificial intelligence (AI), 5G telecommunications, cloud services, and advanced data processing.

As detailed in *Table 3: Latin America's Participation in the AI Lifecycle*, the region remains on the periphery of AI innovation. Latin America does not currently develop foundational AI models. It plays a low-value role in the global AI value chain—primarily as a source of critical minerals, digital behavioral data, and human labor for data annotation and content moderation. Much of this labor is informal, temporary, and precarious, reflecting broader structural inequalities in the region's digital economy.

Drawing from the case study *Latin America: A 5G Battleground*, the region lacks domestic manufacturers of advanced technologies such as 5G hardware, GPUs, and AI chips. Instead, countries in the region depend heavily on foreign suppliers—Huawei (China), Ericsson (Sweden), and Nokia (Finland)—for 5G infrastructure and on U.S.-based corporations like Amazon, Microsoft, and Google for cloud services and AI platforms. This dependency limits the region's control over its digital infrastructure and raises serious concerns about data sovereignty and strategic autonomy.

Ongoing geopolitical tensions between the U.S. and China over firms like Huawei have placed Latin American countries amid a high-stakes diplomatic balancing act, further restricting national policy flexibility. These conditions deepen technological dependency, weaken the region's digital sovereignty, and constrain its ability to independently govern and ethically deploy emerging technologies. As a result, inclusive and context-sensitive AI adoption is delayed, and the region remains structurally disadvantaged in the global digital economy.

10. Limited Extraterritorial Enforcement in a Globalized Context

Most regulations and provisions regarding the governance of AI in Latin America lack Extraterritorial reach. Frameworks such as GDPR (EU, 2018) have notable extraterritorial reach.

The principle of "Territoriality", which restricts a state's legal authority to its physical borders, significantly limits Latin America's ability to regulate and enforce accountability over foreign AI systems operating within its territory. Global tech companies lack a local legal presence in most Latin American countries, making it challenging to apply national laws, enforce sanctions, or access essential evidence such as source code or data. The fragmented nature of AI value chains—spanning multiple jurisdictions—further complicates legal responsibility, while asymmetries in power and resources weaken Latin American states' regulatory capacity. Without extraterritorial mechanisms, international cooperation, and local legal requirements for digital platforms, the region risks deepening its digital dependency and enabling a regime of technological impunity. As Ana Karen Cortés, former Director of Costa Rica's PRODHAB, emphasizes, regional coordination and shared enforcement frameworks are essential to safeguard rights and assert digital sovereignty.

CHAPTER IX

9. POLICY ACTIONS & RECOMMENDATIONS

This chapter presents a set of policy actions and strategic recommendations informed by an in-depth analysis of the critical vulnerabilities of AI in Latin America.

9.1 REGIONAL COOPERATION & SYNERGY

A Regional approach is necessary to enhance Latin America's geopolitical standing and influence towards the global conversation on AI.

Latin America is a region highly fragmented both geographically and politically, which makes regional cooperation a challenge in several areas. However, the aspiration to form a cohesive regional bloc is reflected in various coordination and integration mechanisms, such as the Central American Integration System (SICA), where the region has successfully collaborated and created synergies, particularly in trade agreements like CARICOM and MERCOSUR.

Given that artificial intelligence systems are inherently transnational and the region faces considerable political fragmentation, a regional approach to tackling the challenges and opportunities of AI could enable Latin America to create unified regulatory frameworks. These frameworks would enhance the competitiveness of the bloc and promote collective action to reduce inequities. A regional AI strategy can foster collaborative innovation, harmonize regulations, bridge disparities, and ensure that AI's benefits are distributed equitably. This is crucial for promoting sustainable, inclusive development while addressing the unique challenges faced by the region.

NEGOTIATE AS A BLOC & PROVIDE SCALE

One of the key reasons for negotiating as a bloc is the increased leverage that comes with a unified approach when engaging with tech giants. Currently, negotiations regarding AI systems and technological platforms are conducted bilaterally, with countries like Brazil, as seen in the Case Study, facing challenges in asserting their national laws against transnational companies. Brazil is one of the few countries in Latin America with the scale to handle such negotiations independently.

However, a collective approach with the rest of the region would strengthen the bloc's position to enforce regulatory frameworks and address the enforcement gap created by the "principle of territoriality." This would require companies deploying AI systems in the region to establish a legal presence there, subjecting them to local controls and regulations. Even Brazil, our regional giant, has faced pressure from tech companies, particularly from Silicon Valley, to modify its regulations, as discussed in a recent TechPolicy article, Brazil's AI Law Faces Uncertain Future as Big Tech Warms to Trump.

Coordinate Regulation

A fragmented global or regional regulatory landscape limits synergies and collaboration on regional initiatives and reduces scalability. By leveraging collaborative mechanisms like the Economic Commission for Latin America and the Caribbean (ECLAC) or the Organization of American States (OAS), Latin American countries can establish common minimum regulatory frameworks that enhance the region's strengths and mitigate risks collectively.

Data Governance as priority

By fostering synergies and establishing regulatory frameworks that facilitate cross-border collaboration, Latin America can strengthen the development of a regional AI ecosystem. This can involve sharing regional data or creating a networked infrastructure that supports the entire region, providing increased computing power and facilitating more robust AI development.

Security & Fight Organized Crime

Organized crime knows no borders and operates regionally. Only through regional collaboration in intelligence-sharing and joint security policies can the region effectively confront this growing threat, particularly as organized crime increasingly utilizes technology and AI in its operations. National police forces often lack the resources to counter such sophisticated tactics. In this case, regional cooperation is indispensable for building a coordinated response to this challenge.

9.2 Institutional Transformation

In most countries, our institutions and their design are shaped by the colonial legacy of the region and were created for a reality of Latin America that no longer exists. Institutions play a crucial role in how democracies will address the challenges posed by AI, as well as in the capacity of governments to mitigate and counter risks while ensuring its ethical use and that it generates benefits for all people. If institutions lack the capacity to do so, we will face failure and a loss of public trust in these institutions, leading to democratic erosion. The following are some Institutional transformation is necessary to avoid that outcome.

Addressing Emerging Risks

AI has the potential to introduce risks, such as algorithmic biases, privacy concerns, and job displacement. Institutions must adapt to effectively regulate AI systems, ensuring they are used ethically and equitably. Without transformation, institutions may fail to mitigate these risks, leading to social and economic disparities.

Ensuring Ethical Use: Institutions must be capable of overseeing AI applications to ensure they align with human rights and democratic values. This includes safeguarding individual privacy, promoting transparency in AI decision-making, and ensuring that AI benefits are distributed equitably.

Adapting to New Technological Realities

The nature of AI is transnational, meaning that technological advancements occur across borders and require cross-jurisdictional collaboration. Institutions must modernize their frameworks to handle cross-border challenges in data flow, regulatory compliance, and international cooperation.

Building Public Trust: To maintain democratic legitimacy, institutions must adapt to ensure they remain responsive to public concerns about AI. Failure to do so could result in the erosion of public trust in democratic processes, undermining the stability of governance systems.

Fostering Innovation

AI can drive economic growth and innovation if leveraged correctly. Institutions must create an environment that encourages the ethical development of AI while fostering collaboration between governments, the private sector, and civil society.

9.3. Prioritize Education and capacity building

The region's priority should be a rapid transformation of the education system to integrate digital education across all levels of the curriculum in every school. Special attention must be given to schools in rural areas throughout the region, where the lack of access to digital education is one of the main causes of subsequent labor market inequities. This limitation stems from the lack of connectivity infrastructure, insufficient computing equipment, and the absence of teachers with the necessary knowledge and skills to teach and incorporate these tools into the classroom.

Teacher training should also be prioritized. By doing so, AI tools can be integrated not only for teaching purposes but also to enhance and streamline the time teachers spend on administrative tasks, allowing them to focus more on instruction and student engagement. AI could improve processes and reduce administrative burdens on teachers.

A clear route to these transitions should be made with clear short, medium and long-terms actions and outcomes.

In the short term, it is essential to establish a solid foundation for digital and AI literacy by incorporating basic digital skills and AI principles into primary and secondary education. This can be achieved through the development of online platforms for teacher training, forming public-private collaborations to accelerate skill development, and launching initiatives to raise awareness of the importance of AI literacy for the future workforce. These efforts will help equip both educators and students with the essential tools to thrive in a rapidly digitizing world, while also providing opportunities for hands-on AI learning in underserved communities.

In the medium term, the focus should shift to integrating more advanced AI education into higher education and vocational training. Universities should offer specialized programs in AI, including majors and minors, and design high school curricula that serve as a seamless transition to these programs. Additionally, comprehensive reskilling programs for the workforce must be introduced, with an emphasis on enhancing digital and AI skills for professionals. Governments should create national strategies for AI literacy and foster regional collaboration to ensure equitable access to resources and cross-border initiatives that promote inclusion.

In the long term, AI and digital literacy should be incorporated as essential skills at every stage of the education system, from elementary school through university. This will guarantee continuous, up-to-date education in AI, aligned with technological advancements. Full integration of AI into the educational infrastructure is key, with the development of personalized learning platforms and AI-powered tools that improve accessibility and inclusivity for all learners. Lastly, strong policy frameworks must be put in place to ensure that AI education remains ethical, inclusive, and equitable, with global cooperation to set ethical standards and ensure broad access to AI learning opportunities.

9.4 Industrial Policies to leverage AI

There is a growing interest in industrial policy related to technology. Much of the conversation sparked by the CHIPS and Science Act88 and the U.S. Inflation Reduction Act89, which provided $369 billion in tax incentives and federal spending, has driven energy security and climate change mitigation during the Biden administration. Although this legislation has now been revoked by the Trump administration, it opened up a discussion about the extent to which governments should create the conditions and influence the generation of new technological markets through interventions or policies such as incentives, subsidies, procurement processes, and more.

The primary goal of these policies is to support domestic manufacturing to achieve various economic and non-economic objectives. This includes driving the structural transformation of the economy, improving public health, ensuring national security, combating climate change, and increasing supply chain security.

Many countries, particularly in Latin America, as well as other parts of the world, are moving forward with the development of artificial intelligence (AI) strategies to capitalize on the opportunities opened by the nearshoring and friend-shoring sectors highlighted by the CHIPS and Science Act, allowing our nations to integrate into the semiconductor supply chain.

While this is an important step and a "stepping stone" toward developing broader visions, it is necessary to move quickly from an AI strategy to a comprehensive vision of economic growth, well-being, and sustainability alongside artificial intelligence. In other words, a more global vision that includes the economic, productive, educational models, and investment ecosystems, in order to generate a more integrated approach that considers the current technological reality, which is already present and transversal to our social dynamics. Therefore, a transversal strategy should be the solution.

This approach will include, as mentioned in other recommendations, a transformation of the institutional apparatus to adapt to the dynamics and needs of our populations in a changing and complex reality, aiming to become more dynamic, flexible, and agile in our actions.

Furthermore, a significant review of regulatory frameworks is needed to enable, mitigate risks, and ensure benefits for all. The definition of each industrial policy will be the responsibility of each country, but having a clear regional route, with the possibility of strengthening collaboration and consolidating regional strengths, will provide an important direction for seeking regional complementarity in each nation.

9.5 Investment mechanisms & Pipeline

- Funding mechanisms for AI ecosystem: Industrial Policies should include and enable funding mechanisms from public and private entities, this funding mechanism should be sustained and continued in order to create an ecosystem
- Investment in Connectivity and Data Infrastructure: Prioritization should include 5G first and foremost, but also Fiber deployment, Data Center and Cloud infrastructure, Open Data, and National and eventually regional repositories.
- Prioritize rural areas: Close the digital divide between urban and rural areas, where rural areas face disadvantages in connectivity and digital education.

---

[88] CHIPS ACT. (2022). *CHIPS Act: Creating Helpful Incentives to Produce Semiconductors for America Fund*. H.R. 4346.
[89] H.R. 5376 - Inflation Reduction Act of 2022. (2022). United States Congress.

9.6 Future Research

Artificial intelligence, with its potential, offers us a beacon of hope in our quest to address the significant challenges of our time and the future. This potential, I genuinely believe, is immense and can greatly benefit Latin America. However, to harness this power equitably and inclusively, certain conditions must be in place. AI, while not a panacea for inequality or exclusion, can be a powerful tool if we acknowledge and address the deeply rooted and multifactorial social structures that perpetuate these issues. The urgency of this task cannot be overstated. Failure to do so could result in AI systems benefiting only those who already have the tools and the power, leaving large sectors of the population in Latin America and beyond behind—further deepening existing inequalities and increasing social tensions.

Latin America is the most unequal region in the world, and that is not a promising starting point. Much work remains to be done. Yet this moment also presents a unique opportunity for the region to come together, collaborate, and strengthen its global negotiating capacity. It is only through this collective action that we can ensure that the diverse and plural voice of Latin America is heard in decision-making spaces where it has historically been excluded but whose outcomes affect it deeply. Only by working together can we make the most of AI, better mitigate its risks, and safeguard our societies.

I undertook this work to place Latin America at the center of the conversation—to remind us that millions of lives in this beautiful, diverse, and complex region will be impacted by these AI systems, for better or worse, depending on the decisions we make today. Far from exhausting the topic in depth, this text aims to offer a bird’s-eye view of critical vulnerabilities faced by the region, with the hope that policymakers, researchers, and advocates will pick up the thread, expand on it, take it further or challenge it, playing a crucial role in shaping a more equitable AI future for Latin America and for all.

Bibliography

Beittel, J. S. (2022, June 7). ***Mexico: Organized Crime and Drug Trafficking Organizations*** (CRS Report No. R41576). Congressional Research Service. https://crsreports.congress.gov/product/pdf/R/R41576

Berman, N., Maizland, L., & Chatzky, A. (2023, February 8). ***Is China's Huawei a Threat to U.S. National Security?*** Council on Foreign Relations. https://www.cfr.org/backgrounder/chinas-huawei-threat-us-national-security

Centro Nacional de Inteligencia Artificial (CNIA). (2023). ***Índice Latinoamericano de Inteligencia Artificial*** (1st ed.). Santiago de Chile. https://indicelatam.cl/

Centro Nacional de Inteligencia Artificial (CNIA). (2024). ***Índice Latinoamericano de Inteligencia Artificial*** (1st ed.). Santiago de Chile. https://indicelatam.cl/

CHIPS Act. (2022). ***CHIPS Act: Creating Helpful Incentives to Produce Semiconductors for America Fund***. H.R. 4346.

Corvalán, J. (2011). El esquema cruzado como forma de análisis cualitativo en ciencias sociales. ***Cinta de Moebio***, (42), 243–260. https://doi.org/10.4067/S0717-554X2011000300002

Cortés Víquez, A. K., & Matus Arenas, J. (2021). ***Estado de la legislación en materia de violencia de género digital en Latinoamérica*** (Programa EUROsociAL+, No. 103). Expertise France. https://eurosocial.eu

Cortés Viquez, A. K. (2025, April 4). Interview by C. Dobles. Personal interview.

Di Ielsi, C., & Negri, P. (2021). ***Base de Imágenes Latinoamericana para Reconocimiento Facial***. SAIV - Simposio Argentino de Imágenes y Visión, 50JAIIO. https://www.researchgate.net/publication/357869687

European Parliament and Council of the European Union. (2016). ***Regulation (EU) 2016/679***: General Data Protection Regulation (GDPR). https://gdpr-info.eu/

European Parliament and Council of the European Union. (2024). ***Regulation (EU) 2024/1689 laying down harmonised rules on artificial intelligence***. ***Official Journal of the European Union***, L 259, 1–163. https://eur-lex.europa.eu/eli/reg/2024/1689/oj

Fernandez, V. (2017). The finance of innovation in Latin America. ***International Review of Financial Analysis***, 53, 37–47. https://doi.org/10.1016/j.irfa.2017.08.008

Flórez Rojas, M. L. (2025). The shaping of AI policies in Latin America: A study of international influence and local realities. In ***Public Governance and Emerging Technologies*** (pp. 263–287). https://doi.org/10.1007/978-3-031-84748-6_12

Fontes, C., Hohma, E., Corrigan, C. C., & Lütge, C. (2022). AI-powered public surveillance systems: Why we (might) need them and how we want them. ***Technology in Society***, 71, 102137. https://doi.org/10.1016/j.techsoc.2022.102137

García Periche, J., & Martínez Pinto, C. (2024). ***AI and the SDGs in Latin America and the Caribbean***. CAF – Development Bank of Latin America and the Caribbean. https://www.caf.com

Gmyrek, P., Winkler, H., & Garganta, S. (2024). Buffer or bottleneck? Employment exposure to generative AI and the digital divide in Latin America. ***ILO Working Paper 121***. https://doi.org/10.54394/TFZY7681

GSMA Intelligence. (2023). ***5G in Latin America: Unleashing the potential***. GSMA and Huawei Technologies Co., Ltd.

Hickok, M. (2020). Lessons learned from AI ethics principles for future actions. ***AI and Ethics***, 1(1), 41–47. https://doi.org/10.1007/s43681-020-00008-1

H.R. 5376 - Inflation Reduction Act of 2022. (2022). United States Congress.

Huttenlocher, D., Ozdaglar, A., & Goldston, D. (2023). ***A framework for U.S. AI governance: Creating a safe and thriving AI sector*** (Policy Brief). Massachusetts Institute of Technology. http://aipolicy.mit.edu

Ibero-American Data Protection Network (RIPD). (2021, March 4). ***Declaration of the Ibero-American Data Protection Network against digital violence towards women and girls***. Cartagena de Indias.

International Labour Organization (ILO). (2024). ***Labour overview: Latin America and the Caribbean – Executive summary***. https://www.ilo.org/americas

Jobin, A., Ienca, M., & Vayena, E. (2019). The global landscape of AI ethics guidelines. ***Nature Machine Intelligence***. https://doi.org/10.1038/s42256-019-0088-2

Kuru, A. (2015). Cross impact analysis: An alternative way of qualitative data analysis of repertory grid technique. ***Journal of Design Research***, 13(4), 362–380. https://doi.org/10.1504/JDR.2015.074148

López-Calva, L. F., Rodríguez Castelán, C., & Winkler, H. (2025, January 28). Artificial intelligence is transforming middle-class jobs. Can it also help the poor? ***Brookings***.

Manrique-Gómez, L., Montes, T., Rodríguez-Herrera, A., & Manrique, R. (n.d.). ***Historical Ink: 19th century Latin American Spanish newspaper corpus with LLM OCR correction***. Universidad de los Andes and Rice University.

Maslej, N., et al. (2024). ***The AI Index 2024 Annual Report***. Stanford University, Institute for Human-Centered AI. https://aiindex.stanford.edu

Meza Jimenez, V., & Pérez, E. (2022). The role of artificial intelligence in Latin America's energy transition. ***IEEE Latin America Transactions***, 20(11), 2404–2412. https://doi.org/10.1109/TLA.2022.123456

Milan, S., & Treré, E. (2019). Big data from the South(s): Beyond data universalism. ***Television & New Media***, 20(4), 319–335. https://doi.org/10.1177/1527476419837739

Mittelstadt, B. (2019). Principles alone cannot guarantee ethical AI. ***Oxford Internet Institute***; ***The Alan Turing Institute***. https://ssrn.com/abstract=3391293

National Institute of Standards and Technology (NIST). (2023). ***Artificial Intelligence Risk Management Framework (AI RMF 1.0)*** (NIST AI 100-1). https://nvlpubs.nist.gov

Organization of American States (OAS). (2023, March 6). ***Inter-American model law to prevent, sanction, and eradicate digital violence against women on the basis of gender (Preliminary draft)***. Washington, D.C.

Oxford Insights. (2023). ***Government AI Readiness Index 2023***. https://oxfordinsights.com/ai-readiness/ai-readiness-index/

Passarelli, B., Guzzi, A. A., Angeluci, A. C. B., & Junqueira, A. H. (2014). The impact of mobility in Brazilian info centers: AcessaSP case study. ***American International Journal of Contemporary Research***, 4(3), 1–10.

Puyosa, I., Azpúrua, A., & Suárez Pérez, D. (2024). ***Venezuela: A Playbook for Digital Repression***. Atlantic Council, Digital Forensic Research Lab (DFRLab).

Rodrigues de Caires, C. M. (2020). Comprendiendo la debilidad institucional: poder y diseño en las instituciones latinoamericanas. ***Estado & Comunes***, 1(10), 199–202. https://doi.org/10.37228/estado_comunes.v1.n10.2020.157

Roy, D., & Cheatham, A. (2024, July 31). ***Venezuela: The Rise and Fall of a Petrostate***. Council on Foreign Relations. https://www.cfr.org/article/venezuela-rise-and-fall-petrostate

Rubio Núñez, R., Garcia Rossó, R., & Sánchez, V. (2024). ***Desinformación: cómo entenderla, combatirla y protegerse de sus efectos***. Fundación Friedrich Naumann para la Libertad.

Sharma, S. (2023). Trustworthy artificial intelligence: Design of AI governance framework. ***Strategic Analysis***, 47(5), 443–464. https://doi.org/10.1080/09700161.2023.2288994

Singer, F. (2023, February 20). No son periodistas, son avatares: el chavismo impulsa propaganda hecha con inteligencia artificial. ***El País***. https://elpais.com/america/venezuela/2023-02-20/no-son-periodistas-son-avatares-el-chavismo-impulsa-propaganda-hecha-con-inteligencia-artificial.html

Siroit, G. (2024). ***Critical minerals for energy transitions of Latin America and the Caribbean***. Latin American Energy Organization (OLADE).

Soto, M. (2025, February 7). Interview by C. Dobles. Personal interview.

Tamayo Flórez, P. A., Manrique, R., & Pereira Nunes, B. (2023). HABLA: A dataset of Latin American Spanish accents for voice anti-spoofing. In ***Proceedings of Interspeech 2023*** (pp. 1963–1966). https://doi.org/10.21437/Interspeech.2023-22722

Torrealba, M., & Viloria, Y. (2023). Disinformation in Venezuela: Media Ecosystem and Government Controls. ***Pensamiento Propio***, (58).

UNESCO. (2022). ***Recommendation on the ethics of artificial intelligence***. United Nations Educational, Scientific and Cultural Organization.

UNESCO. (2023). ***Declaración de Santiago para promover una inteligencia artificial ética en América Latina y el Caribe***. Santiago de Chile.

United Nations. (2023). ***International data governance: Pathways to progress***. Chief Executives Board for Coordination.

Valente, J. C. L., & Grohmann, R. (2024). Critical data studies with Latin America: Theorizing beyond data colonialism. In A. Daly, R. Milan, & S. Treré (Eds.), ***Critical Data Studies and the Global South***. MIT Press.

Venturini, J., & Garay, V. (2021). ***Reconocimiento facial en América Latina: tendencias en la implementación de una tecnología perversa***. Consorcio Al Sur. https://www.alsur.lat/

Wang, H., & Fu, L. (2022). Latin America's 5G Construction in the Context of the Sino-US Technology Game: Challenges and Prospects. ***Journal of Latin American Studies***, 44(2).

World Economic Forum. (2023). ***The "AI divide" between the Global North and the Global South***. https://www.weforum.org/agenda/2023/01/davos23-ai-divide-global-north-global-south/

Zewe, A. (2025, January 17). ***Explained: Generative AI's environmental impact***. MIT News. https://news.mit.edu/2025/explained-generative-ai-environmental-impact-0117