IAI
Inter-American Institute for Global Change Research

Droughts in the Americas: Regional priorities, early warning systems, and sustainable development

Report of the side event at the 33rd Conference of the Parties (CoP-33) of the IAI

Wednesday 28 May 2025 (hybrid)
Hotel Crowne Plaza, Asunción, Paraguay

Co-organized by the Research Center for Global Change (CICAG) of the National University of Asunción, the National Council of Science and Technology of Paraguay (CONACYT), the World Meteorological Organization (WMO) Regional Office for the Americas, the United Nations Convention to Combat Desertification (UNCCD), and the Inter-American Institute for Global Change Research (IAI), the event brought together experts, decision-makers, private sector actors, funders, and civil society to formulate concrete recommendations on droughts in response to the needs of vulnerable productive sectors in Paraguay and the Americas.

Welcome remarks

Julián Báez, Director of the WMO Regional Office for the Americas, welcomed attendees, expressing appreciation for their participation. He emphasized the importance of the topic and the collaborative spirit that made the event possible.

He noted the main objectives of the event which were to:

- Identify challenges and opportunities for the implementation and sustainability of drought early warning systems (EWS), particularly for vulnerable sectors such as agriculture, energy, and transportation;
- Exchange good practices, lessons learned, and innovative tools for drought management and impact mitigation;
- Promote regional collaboration and capacity building, leveraging networks across the host organizations;
- Formulate key recommendations in support of a joint declaration on droughts and extreme events, with the aim of contributing to national and multilateral science-policy discussions.

Representatives of Paraguay: Mario Clari, Member of the Governing Council of National Council for Science and Technology of Paraguay (CONACYT), Constantino Nicolás Guefos Kapsalis, Dean of the Faculty of Exact and Natural Sciences (FACEN), National University of Asunción and Eduardo Mingo, Director of the Directorate of Meteorology and Hydrology (DMH) of Paraguay, also offered welcoming remarks underscoring the critical role of drought management in the region and the importance of coordinated efforts to address these increasingly severe challenges.

Anna Stewart Ibarra, Executive Director of the IAI, warmly welcomed participants and highlighted the incredible diversity and potential of the group, each person bringing unique skills, knowledge, and personal qualities.

She emphasized the transformative power of this collective, noting that real change is possible when such diverse actors come together. Looking ahead, she challenged the group to imagine what could be achieved if we truly manage to work together, a significant challenge, but also a vital opportunity.

She called for a new paradigm, one in which solutions to the region's most pressing issues are co-created through collaboration, driven by a shared vision of the future we want. In particular, she encouraged participants to reflect on how this event could serve as a

turning point in the regional response to droughts, extreme weather events, and heatwaves.

In closing, she expressed hope that participants would see themselves as agents of change, capable of shaping a more resilient and sustainable future for the Americas.

The following session was organized around five “short talks” on the following topics: 1. UNCCD drought economics, IDRA and IDRO, 2. WMO State of the Climate for Latin America and the Caribbean (LAC) 2024 with a focus on Drought Management, 3. Early warning systems (EWS) and the productive sector, 4. Drought in the Southern Cone: Case study of Drought Information System for Southern South America (SISSA), and 5. Energy Sector and the Yacyretá 2021 Case study.

Summaries of short talks

1. UNCCD drought economics: "From Commitment to Action: UNCCD’s Role in Shaping Drought Resilience & Land Restoration"

Presented by Daniel Tsegai, Program Officer, United Nations Convention to Combat Desertification (UNCCD)

The presenter delivered an overview of the global challenge of drought and the central role of the UNCCD in fostering drought resilience and promoting land restoration. He began by introducing the UNCCD as the sole legally binding international agreement dedicated to addressing desertification and mitigating the impacts of drought. Since its adoption in 1994 and entry into force in 1996, the Convention has brought together 197 Parties, including 196 countries and the European Union, to coordinate action on land degradation and water scarcity.

He highlighted the alarming trends associated with drought, including a 29% increase in drought frequency since 2000 and projections indicating that global freshwater demand will outstrip supply by 40% by 2030. He stressed that drought is not merely a climatic phenomenon but a multidimensional hazard with profound social and economic consequences. According to recent data, one in four people globally was affected by drought between 2022 and 2023, with 85% of those impacted living in low- and middle-income countries.

He emphasized the economic toll of inaction, noting that the cost of drought-related damage from 2000 to 2019 is estimated at USD 128 billion, though the actual figure may be closer to USD 307 billion annually due to cascading impacts. He distinguished between drought, aridity, and desertification, underscoring that drought is a temporary and often socially exacerbated crisis, unlike permanent aridity or long-term desertification caused by poor land management.

The presentation introduced the International Drought Resilience Alliance (IDRA), a global coalition launched by Spain and Saudi Arabia, which now includes 40 countries and 28 organizations. This alliance aims to mobilize political, technical, and financial capital to enhance drought resilience globally. A key initiative discussed was the development of the International Drought Resilience Observatory (IDRO), which will integrate data analytics, artificial intelligence, early warning systems, and reporting tools to support informed decision-making.

He also presented outcomes from UNCCD COP 16, held in December 2024, emphasizing the financial commitments made to support drought resilience, including USD 150 million from the Riyadh Global Drought Resilience Partnership, USD 1 billion each from the OPEC Fund and the Islamic Development Bank, and USD 10 billion pledged by the Arab Coordination Group. He highlighted initiatives such as the Great Green Wall Accelerator and the increasing engagement of youth, Indigenous Peoples, and the private sector in land restoration efforts.

In closing, he introduced the UNCCD's Community of Learning and Practice (CLP), which aims to build capacity, promote policy development, and facilitate inclusive and collaborative approaches to land and drought management. Through shared knowledge and innovative solutions, the CLP is designed to support countries in building long-term resilience and reducing vulnerability to drought.

2. WMO State of the Climate for LAC 2024 – Focus on Drought Management

Presented by Bárbara Tapia Cortés, Technical Coordinator, Regional Office for the Americas, World Meteorological Organization (WMO)

Bárbara Tapia Cortés presented the latest findings from the WMO's 2024 State of the Climate in Latin America and the Caribbean report, focusing on drought and its broader context within extreme weather patterns affecting the region. Her intervention emphasized the critical role of regular climate monitoring in informing policy and supporting decision-making throughout the LAC region.

She highlighted that drought conditions have severely impacted vast areas, including northwest Mexico, the Yucatán Peninsula, parts of Central America and the Caribbean, the Amazon and Pantanal regions, central and northern South America, western Argentina, and north-central Chile. These patterns, exacerbated by El Niño conditions in early 2024, form part of a broader regional trend of climate instability.

Several key examples in 2024 illustrated the intensity of recent climate-related events:

- The disappearance of the Humboldt Glacier in Venezuela marked the country as the second in the world to lose all of its glaciers, a powerful indicator of accelerated climate change.
- Heatwaves are increasingly frequent and prolonged. For example, a 21-day heatwave in Mexico between April and June resulted in 1,937 reported cases of heat-related

illness and 90 deaths. A record temperature of 34.7°C was recorded on 25 May 2024. Brazil also experienced extreme heat, with Palmas recording 41.6°C on 22 September 2024.

- Wildfires in central Chile were described as the worst climate-related disaster in the country's modern history, causing over 130 deaths in the Valparaíso region. The Chilean government characterized the event as the most devastating natural catastrophe since the 2010 earthquake.
- Severe flooding in Brazil's Rio Grande do Sul led to more than 180 fatalities and approximately USD 1.5 billion in agricultural damages, particularly affecting soybean production.
- Hurricane Beryl, the first category 5 hurricane ever recorded so early in the Atlantic season, caused widespread devastation in Grenada and surrounding areas. The 2024 hurricane season overall was more active than average, with 18 named storms compared to the usual 14.

She concluded by emphasizing the growing threat to food security across the region due to extreme weather events. In Brazil, floods severely damaged agricultural production, with soybeans being the most affected. In El Salvador and Nicaragua, alternating droughts and intense rainfall disrupted maize cultivation in the Dry Corridor. In El Salvador specifically, this led to significant production losses in 2024, impacting rural livelihoods and exacerbating concerns over food availability.

Tapia underscored the urgent need for resilience strategies, improved early warning systems, and the strengthening of food systems across Latin America and the Caribbean to adapt to the accelerating pace of climate change.

3. Early Warning Systems (EWS) and the productive sector

Presented by Osvaldo Moraes, Director of Climate and Sustainability Department, Minister of Science, Technology and Innovation (MCTI), Brazil. Coordinator of the Standing Committee on Disaster Risk Reduction and Early Warning Services (SC-DRR), WMO

Osvaldo Moraes offered a reflection on the nature of droughts and the broader context of climate change. He noted that the droughts we are currently facing are likely to evolve and intensify in the future. To illustrate the fragility of Earth's atmosphere, he used a striking metaphor: "If we were to place a layer of varnish on a pool ball, the thickness of that layer would be greater than the depth of the troposphere relative to the size of the Earth." This emphasizes how thin and vulnerable the atmospheric layer is in which weather and climate processes occur.

He also addressed the concept of climate services, defining them as "the provision and use of climate data, information, and knowledge to support decision-making." One of the most impactful examples of a climate service, he added, is the Early Warning System (EWS), which helps societies anticipate and respond to extreme climate events.

He emphasized that understanding risk is more important than simply understanding the risks. This distinction is critical for designing an effective EWS.

He highlighted the fundamental differences between EWSs for floods and those for droughts, noting that these differences can be characterized by several factors: spatial scale, temporal scale, impacts, and target audience.

For example, droughts typically result in fewer immediate deaths but unfold over a longer time period, making them more complex to monitor and manage. In contrast, floods tend to occur on a shorter timescale, often causing a higher number of fatalities in a brief period.

Therefore, EWSs must be tailored to the nature of each hazard. A flood EWS requires rapid response and communication, while drought EWSs must consider longer-term risk assessment, monitoring trends, and sustained action over time.

He provided a conceptual overview of disaster risk, explaining that it comprises three key elements: hazard, vulnerability, and exposure. While the hazard itself may be natural, vulnerability and exposure are anthropogenic factors, meaning they are shaped by human decisions, behaviors, and systems. As such, we have the ability to manage and reduce risk related to anthropogenic threats, but when it comes to natural hazards, we must learn to live with them and adapt accordingly.

Droughts, in particular, were described as impacts shaped by human activity, not just natural occurrences. Moraes emphasized that improving our capacity to address droughts involves recognizing what we are capable of controlling and acting on it.

In his final message, he stressed that enhancing our ability to predict droughts, and more importantly, to mitigate their impacts, requires collective action. While there are excellent researchers working on these issues, their numbers are limited. Without collaboration, progress will be slow.

Moraes noted that technological tools already exist, such as satellites that monitor soil moisture, allowing for real-time data collection and early indicators of drought conditions.

However, he highlighted the need to go beyond technology: we must engage in dialogue with users, particularly those outside academia. While collaboration with the research community is strong, engagement with decision-makers remains a significant challenge, often due to institutional weaknesses and political instability in many countries.

He concluded by stating that if we aim to reduce the impacts of droughts, it is not enough to forecast the events themselves. We must also work to forecast and understand their potential impacts, especially those driven by human vulnerability.

4. Drought in the Southern Cone: Case study of Drought Information System for Southern South America (SISSA)

Maria de los Milagros Skansi, Central Director of Climate Monitoring of the National Meteorological Service of Argentina and Coordinator of SISSA

Maria de los Milagros Skansi shared lessons learned from the SISSA project, which aims to generate information and knowledge that supports proactive drought management, with a particular focus on the agriculture, hydro-energy, and inland waterway transport sectors.

The system is built on several key pillars:

- Monitoring and forecasting,
- Risk characterization,
- Understanding planning and mitigation actions in response to drought events, and
- Integration with national policies

She noted that substantial progress has been made in improving precipitation forecasts, allowing for the development of a drought index based on precipitation data. However, one of the ongoing challenges is understanding how to translate climate information into actionable insights about potential sectoral impacts.

As part of its knowledge dissemination efforts, SISSA has produced videos and documentation to help build capacity and to contextualize each of the system's tools and products.

SISSA has implemented so-called demonstration projects, which embodied the principles of co-design and co-production. These projects were developed in tandem with national working groups, and involved mapping relevant regulations, stakeholders, and drought response plans across participating countries. The findings were used to create policy briefs aimed at strengthening national drought governance. It was noted that institutional continuity remains a challenge due to frequent changes in government administrations.

She emphasized that drought is a complex phenomenon that requires a coordinated and multisectoral approach. The project seeks to promote risk management strategies grounded in useful, accessible, and science-based information, co-produced with local and regional actors.

Finally, the speaker highlighted that co-design and co-production processes not only enhance institutional capacities but also build trust across sectors, a crucial element for effective risk management.

5. Energy Sector and the Yacyretá 2021 Case study

Presented by Lucas Chamorro, Entidad Binacional Yacyretá

Lucas Chamorro opened his presentation by highlighting one of the most visible impacts of drought in the region: the extraordinary low water levels at the Yacyretá hydroelectric power plant. This situation triggered a series of complex bilateral negotiations among Paraguay, Argentina, and Brazil, each with distinct priorities and needs.

For Paraguay, a central concern was securing the water volumes necessary to ensure river navigation and enable the transport of 150,000 tons of goods downstream across eight shipments over three years. In contrast, Argentina and Brazil focused on ensuring minimum flows for drinking water supply and environmental protection. Brazil, notably, manages over 150 reservoirs, primarily for water storage.

After lengthy negotiations, based on international principles, solidarity, and cooperative frameworks, the countries succeeded in agreeing on water release windows to facilitate these operations. While a similar bilateral agreement had taken place in 2018, the severity and extent of the most recent drought required broader regional participation.

Chamorro stressed that such negotiations are never straightforward or singular; rather, they are part of an ongoing process involving hydrological forecasting, which is intrinsically linked to climate predictions. What the energy sector ultimately seeks is predictability, even though operational decisions must often be made under significant uncertainty.

He noted that outcomes from this period of cooperation included the development of technical manuals and regulatory guidelines, improved logistical coordination with the transport sector, strengthened relationships between meteorological services and operational actors, and ongoing coordination between Paraguay and Argentina. Internal institutional coordination also improved, along with downstream dredging and the adoption of a constellation of digital platforms to support real-time information sharing.

Summary of Panels Session

The Panels session was structured among three panels: 1. Science Policy nexus: Research opportunities and gaps, 2. A new funding model to strengthen drought resilience and early warning systems, and 3. The role of science diplomacy in climate resilience.

Panel 1: Science and Public Policy — Opportunities and Research Gaps

Moderated by Amparo Martínez, National Autonomous University of Mexico (UNAM)
Speakers: Ghislaine Echeverry, Institute of Hydrology, Meteorology, and Environmental Studies (IDEAM); Grinia Avalos, National Meteorology and Hydrology Service of Peru (SENAMHI); and Gaston Torres, Chilean Meteorological Service.

The first panel of the session, introduced by Julian Báez, focused on the critical intersection of science and public policy. The discussion addressed persistent gaps in translating scientific knowledge into decision-making, while also highlighting innovative experiences from the LAC region that are reshaping institutional responses to global change. The panel emphasized the imperative to bridge knowledge systems and build trust among researchers, institutions, and communities.

The moderator opened the panel by acknowledging the crucial role of science in responding to regional and national challenges, especially those related to climate change. She underscored the urgency of creating genuine connections between the scientific community and public institutions. In doing so, she reminded the audience that scientific models and forecasts only become truly meaningful when they reflect the lived realities of people and are informed by diverse types of knowledge. She affirmed that all three panelists represent not only scientific leadership within their respective countries but are also directly engaged with public institutions and the ENANDES initiative, a regional effort supported by the WMO.

Gastón Torres shared insights into the challenges faced by national meteorological services in transforming climate data into usable information. He noted that while Chile has developed a range of climate services and products, these have often fallen short of addressing user needs due to a disconnect between academic research and operational implementation. Droughts, for instance, impact different regions and agricultural systems in specific and nuanced ways. Torres highlighted that a “one-size-fits-all” approach had initially limited the utility of climate products. In response, the agency began prioritizing the development of localized, user-informed services. This has required more robust collaboration between scientists and national meteorological services, enabling research outcomes to be converted into practical, actionable tools for different sectors.

Following Torres’ remarks, Ghislaine Echeverry described a similar institutional evolution. She explained that IDEAM generates a vast body of knowledge meant to serve society. However, historical gaps between IDEAM and academic institutions have made it difficult

for this knowledge to be widely accessed or applied. Echeverry emphasized the importance of tailoring technologies and models to Colombia's complex topography and social context. IDEAM has recently adopted a more open and participatory approach to its data and services, actively working to build trust with external researchers and local communities. According to Echeverry, the agency has overcome legacy technological barriers that previously discouraged collaboration. The institution now provides open access to historical data that are essential for building predictive models and has begun integrating artificial intelligence (AI) technologies to strengthen climate analysis. She noted that many of these tools are no longer speculative or futuristic; they are already available and can be used to support real-time decision-making.

Grinia Ávalos offered reflections on SENAMHI Peru's actions to reconcile its operational role with research and innovation. She recalled that in the past, meteorological services in Peru were seen as isolated from academic inquiry and often viewed as lacking scientific capacity. This perception began to change when SENAMHI made deliberate efforts to engage with the academic community, mapping stakeholders and categorizing different user types in order to align their needs with the appropriate platforms. SENAMHI developed internal research lines, created new collaboration mechanisms, and started to institutionalize recognition for researchers who contributed to public decision-making processes. Ávalos explained that while SENAMHI does not have extensive capacity to publish in international scientific journals, it has succeeded in creating meaningful linkages with other sectors. One example is its collaboration with Peru's Ministry of Environment, which now collects scientific outputs that inform operational tools and public policy. These contributions are formally recognized and supported, allowing researchers to present their work at high-level meetings, including the Council of Ministers. For Ávalos, these experiences exemplify positive, replicable models of science–policy engagement.

In a second round of interventions, the moderator asked the panelists to identify what their countries need most in order to strengthen cross-sectoral and interdisciplinary collaboration. Grinia Ávalos stressed the importance of alliances, especially in resource-constrained settings. Research institutions, she argued, cannot operate in isolation. SENAMHI is currently developing a regulatory office focused on science, technology, and innovation to better connect research with practical application. However, she noted that many public institutions still lack a culture of research or innovation. In this context, meteorological services must proactively seek feedback from the scientific community, and researchers must be willing to participate in collaborative processes that may not yield personal recognition. Engaging in institutional partnerships often means letting go of individual authorship in favor of collective impact, she noted.

Echeverry echoed these sentiments, noting that IDEAM, as Colombia's IAI national permanent representative, has created a dedicated team to promote citizen engagement and research co-creation. Under the ENANDES initiative, IDEAM has led participatory processes to socialize climate information and characterize community vulnerabilities. She emphasized that beyond transdisciplinarity, institutions must move toward genuine "knowledge dialogues" that democratize science and embed it within societal processes. One concrete framework for this is the Escazú Agreement, which

supports institutionalizing transparency and public participation in environmental governance. When engaging Indigenous populations, she added, institutions must recognize not just linguistic but epistemological differences. True dialogue means respecting alternative worldviews and being open to learning about ecosystems through non-Western epistemologies, rather than attempting to impose a single scientific lens.

Gastón Torres concluded the round by highlighting the transformation of Chile's meteorological service, which now embraces closer engagement with scientists despite early resistance. In the past, the agency simply provided climate data and left researchers to interpret it independently. Over time, this limited the potential of both communities. Today, SENAMHI Chile collaborates directly with academic teams, co-developing tools for sectors like apiculture and energy. One notable example was a joint effort to assess the impacts of climate change on beekeeping. The resulting research allowed the agency to build a specialized climate service for beekeepers, addressing their specific operational needs. Similarly, by partnering with Chile's Ministry of Energy and academic institutions, the agency developed sector-specific tools to support energy planning, proving the value of integrating scientific knowledge with service design.

In her closing remarks, Martínez reaffirmed that models and forecasts, while technically sophisticated, must be grounded in real-world needs to be useful. She emphasized that fostering a culture of strategic partnerships is essential, not only among academic disciplines but also across policy sectors and diverse knowledge systems. Institutions must move beyond narrow definitions of research excellence, embracing inclusive and participatory approaches that generate actionable knowledge and long-term resilience. As countries prepare to confront intensifying climate risks, the lessons shared by Chile, Colombia and Peru, offer promising blueprints for enhancing science–policy integration in Latin America.

Panel 2: New Financing Models to Strengthen Drought Resilience and Early Warning Systems

Moderated by Gastón Kremer, World-Transforming Technologies (WTT)
Speakers: Diana Romero, National Council for Science and Technology of Paraguay (CONACYT); Lucas Chamorro, Binational Entity Yacyretá; and Clyde Fraisse, University of Florida.

The second panel addressed the urgent need to reimagine how drought resilience and EWSs are financed and sustained. The discussion brought together three experts working at the intersection of innovation, climate risk management, and science-based governance. Their exchanges underscored the multidimensional nature of drought resilience, not merely as a technical or scientific issue, but as a challenge deeply embedded in institutional design, risk governance, and financial architecture.

Kremer opened the session by framing the complexity of building resilience as one that demands profound institutional innovation. While funding is often cited as a key

constraint, he urged the audience to consider not only the quantity of financial resources available but also how these are mobilized, structured, and targeted. He argued that without strategic reform in financial mechanisms and coordination across sectors, even the most advanced EWSs may fall short of their intended impact.

Lucas Chamorro shared his experience working in a large-scale hydroelectric enterprise that operates across the borders of Argentina and Paraguay. He emphasized the importance of fostering dynamic, cross-sectoral dialogue, including with private actors, to identify and unlock new funding opportunities. According to Chamorro, the private sector is increasingly interested in financing projects that enhance productivity and long-term resilience, particularly when governments demonstrate a political will to improve efficiency. However, he warned that public investment alone is insufficient. For long-term viability, engagement with the private sector must be based on clear returns on investment, especially in climate-sensitive sectors such as agriculture, hydropower, and infrastructure.

Clyde Fraisse remarked on the growing importance of agricultural insurance and EWSs as key levers for enhancing resilience. He explained that many governments are beginning to shift responsibility for climate risk management to the private sector. While this presents certain challenges, it also opens the door for innovation, particularly when risk-transfer mechanisms are linked to incentives for adopting sustainable practices. Fraisse cited the potential of subsidized insurance schemes and climate-resilient credit lines, noting that when such financial instruments are tied to measurable resilience criteria, they can substantially support the adoption of sustainable land and water management practices. In his view, aligning financial instruments with sustainability goals offers one of the most promising opportunities for accelerating adaptation.

Diana Romero emphasized the need to reorient funding priorities to better support long-term, inclusive, and innovative solutions. Drawing from her experience in science governance in Mexico, she explained that one of the main barriers to mobilizing financing is poor communication between actors. In response, CONACYT has worked to create more enabling environments for private sector participation in science-based initiatives. She called on researchers to look beyond traditional academic outputs and contribute to policy-relevant outcomes that can catalyze impact. This shift, she argued, requires the establishment of interface organizations that can translate scientific knowledge into practical tools, reduce institutional friction, and foster collaboration between researchers, innovators, and decision-makers. She also highlighted the potential of citizen science and digital platforms to generate solutions through more diverse and inclusive ecosystems of knowledge.

During the moderated discussion, Kremer asked the panelists to share concrete examples of innovative financing mechanisms that are currently being implemented in their respective contexts. Romero responded by highlighting several initiatives supported by CONACYT Mexico that emerged from academic environments and later extended to local communities. These collaborative projects aim to apply scientific knowledge directly to rural challenges, using participatory methods to co-design climate-smart solutions. She noted that such projects have proven not only technically

sound but socially meaningful, reinforcing the value of academic outreach and inclusive innovation.

Chamorro built on this by reiterating the importance of positioning climate information systems as public goods. He stressed that access to real-time data and robust historical databases is vital for supporting both immediate decision-making and long-term resilience planning. These systems, he argued, must be designed with durability and scalability in mind, requiring long-term public investment and stable institutional frameworks.

Fraisse introduced a critical consideration: that the infrastructure of resilience comes at a cost that extends far beyond installation. For instance, setting up a weather station is only the first step; its maintenance, calibration, and data integration into forecasting systems are ongoing responsibilities that require steady funding. He suggested that large-scale producers, who benefit the most from sophisticated tools, could play a more active role in co-financing the systems, as long as clear public-private partnerships are in place. He also shared an illustrative case from Uruguay, where demand for agricultural insurance fluctuates dramatically depending on seasonal climate forecasts. During La Niña events, farmers rush to purchase insurance, while insurers become reluctant; during El Niño years, the reverse is true. This dynamic demonstrates the need for year-round, structured insurance programs that maintain balanced risk-sharing mechanisms.

Kremer closed the panel by emphasizing the critical role of transparent communication and shared platforms. He argued that for financing mechanisms to be viable and sustainable, all stakeholders, from scientists and policymakers to farmers and insurers, must understand the rules of engagement and trust the process. Only through transparency, coordination, and continuous dialogue can long-term, equitable partnerships be built to sustain early warning systems and drought resilience.

Panel 3: The Role of Science Diplomacy in Climate Resilience

Moderated by Franklin Carrero-Martínez, U.S. National Academies of Sciences, Engineering, and Medicine (NASEM)

Speaker: Agustina Salvati, National Scientific and Technical Research Council (CONICET)
The final discussion explored the role of science diplomacy as a strategic tool to enhance climate resilience across Latin America and the Caribbean.

The discussion offered conceptual clarity and practical insights into how science diplomacy enables countries to address shared climate risks, align research agendas, and build capacities at the national and regional levels.

Carrero-Martínez opened the session by positioning science diplomacy as a vital bridge between scientific communities, governments, and international institutions. He emphasized its role in trust-building and the co-creation of knowledge-based solutions to complex challenges such as climate change. Science diplomacy, he asserted, must go

beyond symbolic exchanges or episodic collaboration. Instead, it should serve as a sustained mechanism for cooperation, dialogue, and mutual learning, especially in a region as diverse and ecologically vulnerable as Latin America.

Salvati offered a grounded view from her experience at CONICET Argentina, one of the leading research institutions in Latin America. She described how international scientific cooperation has increasingly become recognized as a pillar of national resilience. Through interdisciplinary and inter-institutional alliances, Argentina has been able to participate in regional and multilateral frameworks that support joint responses to transboundary climate threats. Salvati stressed that effective science diplomacy depends not only on external collaboration, but also on robust internal infrastructure. This includes institutional focal points, professionalized science-policy interfaces, and frameworks that ensure scientific contributions are visible, impactful, and aligned with national development priorities.

She further clarified that not all international cooperation constitutes science diplomacy. The term becomes operational, she noted, when a country intentionally aligns its scientific efforts with national strategic interests, such as training a new generation of climate scientists to inform public policy or negotiating access to critical technologies. Science diplomacy is about aligning scientific knowledge with governance priorities and thus demands that scientists embrace the dual role of researcher and representative.

In response to a question on the private sector's role in this equation, Salvati warned against the prevailing utilitarian view of science that demands short-term, marketable results. Instead, she argued for a narrative shift that recognizes the long-term public value of scientific research. Scientists must also learn to communicate effectively with broad audiences and be equipped to discuss the co-benefits of science, for example, how climate action contributes to public health or food security.

She shared several notable examples of successful science diplomacy. These included binational projects on artificial intelligence, mobility strategies for energy transition, and a prominent initiative led by a female Indigenous scientist in Argentina focused on developing drought-resistant soybean seeds. These cases exemplify how regional collaboration can deliver both scientific and social impact.

Carrero-Martínez complemented this view by emphasizing the importance of trusted spaces for dialogue, especially in a time of increasing misinformation. He cited the growing skepticism toward science in some national contexts, including alarming statistics showing that nearly 60% of the Argentine population reportedly doubts the existence of climate change. This, he argued, underscores the need for sustained investment in public engagement, institutional legitimacy, and inclusive communication.

Concluding the panel, both speakers affirmed that science diplomacy must become a core function of national governance, embedded in research planning, technology transfer, and international cooperation. Institutions such as the IAI are uniquely positioned to support this agenda by facilitating regional dialogue, enhancing institutional capacities, and translating science into action across multiple sectors.

Conclusion of the meeting

The event concluded by noting that the Declaration of Asunción by the Parties and Institutions Associated with the IAI on Water Security, Biodiversity, and Climate Resilience in the Americas would be presented to IAI Parties during CoP-33 in subsequent days. The declaration outlines commitments to strengthen regional cooperation on EWSs for droughts and other extreme climate events and emphasizes an inclusive approach that acknowledges the importance of science and science diplomacy to address the interconnected challenges of global environmental change and the need for coordinated and resilient adaptation and mitigation strategies.