BUILDING CLIMATE RESILIENCE IN PANAMA THROUGH CAPACITY STRENGTHENING

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Panama faces growing climate risks from climate variability and climate change. Launched in 2023 with a 20-month implementation period, the project "Strengthening Climate Change Capacities for Children and Youth, Decision-Makers, and Establishing a Knowledge Hub in Panama" was designed as a national capacity-building and knowledge initiative led by the Ministry of Environment (MiAMBIENTE), with implementation support from Innovus Consulting and ITACA Solutions, and financial support from CAF – Development Bank of Latin America and the Caribbean.

The project combined education, applied learning, a national drawing contest, and knowledge-sharing tools to strengthen climate change understanding and skills among children, youth, educators, and future leaders, while supporting long-term public access to climate information through a dedicated Knowledge Hub.

Key outputs included the development of an online platform for the Academy on Climate Change for Young Leaders, through which 54 participants were directly trained, and more than 160 former academy students were engaged through an Alumni Program. In parallel, the project supported educators nationwide through the development of four didactic climate education guides for primary and secondary schools, enhanced public access to climate information through the launch of a Knowledge Hub, and reached 710 students from 60 schools through a national drawing contest promoting early climate awareness through creative expression.

PANAMA'S CLIMATE VULNERABILITY AND THE NEED FOR CAPACITY BUILDING

Panama's strategic location as a bridge between oceans and continents heightens its exposure to climate variability and climate change, particularly through shifts in rainfall patterns associated to climate change and climate oscillations such as El Niño–Southern Oscillation (ENSO). These dynamics manifest in more frequent and intense droughts and floods, rising sea levels, and increasing water stress, with wide-ranging implications for ecosystems, infrastructure, and livelihoods. One of the most visible impacts has been on the Panama Canal, a critical artery for global trade. During 2023–2024, prolonged drought conditions reduced water levels in Gatun Lake, limiting freshwater availability for lock operations and leading to restrictions on vessel transits. This episode underscored the canal's vulnerability to climate variability and highlighted the broader economic risks posed by increasing hydrological stress under future climate scenarios. Climate impacts extend beyond the Canal, affecting both urban and rural areas across the country. Coastal and low-lying regions face heightened risks from flooding and sea-level rise, while mountainous areas are increasingly exposed to landslides linked to intense rainfall events. In parallel, climate projections for Central America point to significant potential reductions in yields of staple crops such as maize, rice, and beans, posing risks to food security and rural livelihoods. Panama's Nationally Determined Contribution (NDC) 3.0 recognizes these intersecting vulnerabilities and prioritizes high-risk sectors and territories for targeted adaptation and mitigation actions, particularly in light of the projected increase in extreme events associated with ENSO.

Despite the growing urgency of these challenges, persistent knowledge and capacity gaps among youth, educators, and the wider public continue to limit the effective uptake and application of climate information in decision-making and community action. This project was designed to address these gaps by strengthening climate-related capacities through inclusive, practice-oriented, and user-centered approaches, with an emphasis on education, youth leadership, and accessible knowledge tools. By aligning national priorities with global frameworks such as the Sustainable Development Goals (SDGs) and Action for Climate Empowerment (ACE), the initiative sought to cultivate informed participation and long-term climate resilience in Panama.

PROJECT OVERVIEW AND DESIGN

Designed to translate climate knowledge into action-oriented capacities, the initiative supported mitigation and adaptation efforts aligned with national priorities while contributing to inclusive and sustainable development pathways in Panama. It adopted an integrated approach focused on strengthening climate capacities among children, youth, and future leaders; consolidating a community of practice to sustain youth engagement and peer learning; supporting educators in the integration of climate change into formal education; expanding access to climate-related knowledge through a user-centered Knowledge Hub; and raising early climate awareness among children and adolescents through creative and participatory methodologies.

Its design emphasized inclusive, practical, and flexible learning. Gender considerations were integrated across all components through participation criteria, facilitation approaches, and inclusive language, while a hybrid delivery model helped reduce geographic and connectivity barriers, enabling participation from urban, rural, and indigenous contexts.

Learning materials were developed in accessible formats and combined synchronous and asynchronous activities to accommodate diverse learning needs, schedules, and levels of connectivity.

The theory of change was grounded in the premise that sustained youth engagement—supported by accessible knowledge tools and institutional anchoring—can progressively strengthen climate literacy, leadership, and action. By embedding participation, access, and continuity into its design, rather than relying on isolated activities, the initiative positioned education and knowledge-sharing as foundational enablers of climate action. Alignment with the National Climate Transparency Platform (PNTC) ensured coherence with national climate information systems and supported long-term usability beyond the lifecycle of the initiative.

KEY COMPONENTS OF THE PROJECT

The project was structured around four interconnected components designed to strengthen climate capacities across different age groups and stakeholder profiles through an inclusive and multidisciplinary approach, implemented in collaboration with Innovus Consulting. Together, these components combined youth leadership development, educator support, knowledge access, and creative engagement to reinforce climate literacy and action in Panama.

ACADEMY ON CLIMATE CHANGE FOR YOUNG LEADERS AND ALUMNI PROGRAM

Established in 2018 by Panama's Ministry of Environment (MiAMBIENTE), the Academy on Climate Change for Young Leaders has been a flagship initiative to promote youth participation in climate action, with a focus on strengthening technical knowledge, leadership skills, and evidence-based decision-making in areas such as adaptation, mitigation, and community resilience. Within the framework of this CAF-funded project, efforts focused on strengthening and sustaining the Academy through the development of a dedicated online platform and the implementation of its 9th and 10th editions, with alumni serving as facilitators to reinforce intergenerational learning and program continuity.

The Academy combined flexible, hybrid learning modalities with regionally relevant content addressing priority issues such as water management, coastal risks, food security, and climate justice. Learning activities integrated multimedia resources and project-based approaches, enabling participants to develop community-oriented climate initiatives aligned with national priorities and global agendas. Through this approach, the project directly trained 54 young people (35 women and 19 men), prioritizing depth of engagement and quality of learning outcomes. As a result, participants strengthened their capacities to design and communicate climate-resilient initiatives, incorporating gender and inclusion perspectives.

Building on the Academy, the Alumni Program was designed as a community of practice to sustain engagement beyond formal training cycles and support the translation of climate knowledge into applied initiatives. The program combines mentorship, thematic learning, and peer exchange, fostering collaboration among youth and strengthening linkages with public, private, and civil society actors. In 2024 and 2025, the Alumni Program engaged more than 300 registrants through hybrid activities and structured learning modules focused on climate change, professional development, and climate entrepreneurship. The program culminated in a three-day, in-person Climate Innovation and Entrepreneurship Bootcamp, where participants applied innovation tools to develop climate-aligned business ideas linked to Panama's NDC priorities. Overall, the Alumni Program strengthened youth capacities for climate entrepreneurship and leadership, contributing to the emergence of a new generation of climate action leaders in Panama.

CLIMATE CHANGE TEACHING GUIDES FOR EDUCATORS

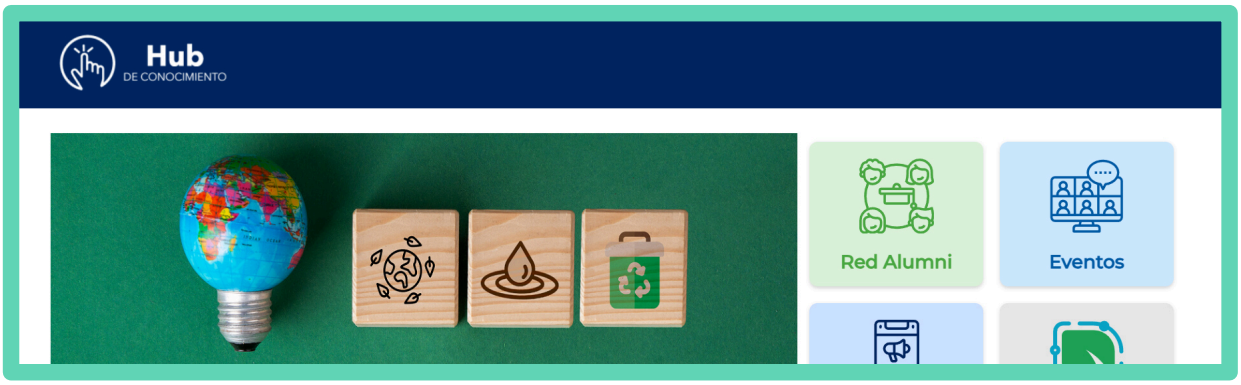
To support the integration of climate change into formal education, the project developed pedagogical and didactic teaching guides aimed at strengthening educators' capacities and fostering climate awareness among students. Four guides—two for primary and two for secondary education—were developed through interdisciplinary collaboration among environmental specialists, educators, and institutional stakeholders, ensuring alignment with Panama's national curriculum and relevance to local contexts.

The guides mainstreamed climate change across multiple subjects and incorporated gender perspectives, including a dedicated guide on women and climate change. They featured experiential learning activities, visual resources, and locally grounded case studies on issues such as droughts and floods.

Validation was carried out through pilot testing in partnership with the Ministry of Education (Meduca) in selected provinces, allowing feedback from teachers to inform final adjustments.

As a result, the project produced validated, adaptable teaching materials that strengthened educators' technical capacities and supported the systematic integration of climate education in both public and private school settings.

CLIMATE CHANGE TEACHING GUIDES FOR PRIMARY AND SECONDARY EDUCATION:
https://itaca.solutions/knowledge-library/guia-de-docentes/



KNOWLEDGE HUB

The Knowledge Hub was developed as a core component of Panama's National Climate Transparency Platform (PNTC), the country's central system for managing and publicly consulting climate action information. Rather than serving solely as a repository, the Hub was designed as a capacity-building space offering curated, reliable, and accessible climate knowledge to support the transversal integration of climate considerations into environmental and development initiatives.

The Hub provides introductory and applied learning resources, including courses for technical professionals and environmental consultants focused on mainstreaming climate change into project design, implementation, and evaluation. Its integration within the PNTC reinforced institutional ownership and long-term sustainability, while its user-oriented structure facilitated access for audiences with varying levels of technical expertise. As a result, the Knowledge Hub strengthened public access to climate information and contributed to improved technical capacities and informed engagement in support of Panama's climate goals.

Climate Knowledge Hub: Public access to structured climate learning resources
https://transparencia-climatica.miambiente.gob.pa/hub-de-conocimiento-4/

DRAWING CONTEST ON CLIMATE CHANGE

The national drawing contest on climate change was designed as a creative and participatory component to raise awareness among children and adolescents and to engage the broader public in dialogue on climate impacts and responses. By using artistic expression as an entry point, the contest fostered early climate literacy and inclusive participation under a gender-sensitive approach.

The initiative reached 710 students from 60 schools nationwide and combined a jury-based selection process with online public voting to broaden engagement. Selected works were showcased through public exhibitions, and a dedicated publication distributed to participating schools, extending the visibility and impact of the initiative. The contest strengthened climate awareness, encouraged creative expression, and created spaces for dialogue within communities, contributing to the formation of a more informed and engaged younger generation prepared to face climate challenges.

Climate change teaching guides for primary and secondary education:

https://itaca.solutions/knowledge-library/guia-de-docentes/

National drawing contest – compilation book of selected works:

https://itaca.solutions/wp-content/uploads/2025/10/Libro_Comprimido.pdf

Academy platform demo and Alumni Network:

A demonstration version of the Academy platform and a summary of the Academy and Alumni Network are available in the annexed documentation.

MEDIA COVERAGE

The initiative received national and international visibility through the following media and institutional channels:

Additional institutional coverage:

https://miambiente.gob.pa/inicia-novena-academia-sobre-cambio-climatico-para-jovenes-lideres/

https://dcc.miambiente.gob.pa/40-jovenes-panamenos-recibiran-formacion-en-la-academia-sobre-cambio-climatico/

CAF – Development Bank of Latin America and the Caribbean:

https://www.caf.com/es/actualidad/noticias/caf-empodera-a-jovenes-para-la-toma-de-decisiones-sostenibles-en-panama/

Ministry of Environment (MiAmbiente):

https://www.miambiente.gob.pa/jovenes-lideres-de-la-academia-sobre-cambio-climatico-inspiracion-accion-y-compromiso-nacional/

National Climate Transparency Platform (MiAmbiente):

https://transparencia-climatica.miambiente.gob.pa/academia-cc/

LESSONS LEARNED

The project generated several lessons that are relevant for the design and implementation of climate capacity-building initiatives in similar contexts.

First, **layered engagement models are more effective than single-track interventions**. By combining intensive training (Academia and Alumni Program), educator-focused tools, creative outreach for children, and a national Knowledge Hub, the project addressed different age groups and stakeholders with differentiated levels of depth and intensity. This multi-level approach reinforced climate literacy across the learning continuum and reduced the risk of isolated or short-lived impacts.

Second, **hybrid and flexible learning modalities are** critical for inclusive participation. Uneven connectivity, time constraints, and geographic dispersion—particularly in rural and indigenous areas—posed structural barriers to engagement. Early participation trends indicated higher dropout risks in fully synchronous formats, prompting the integration of asynchronous content and flexible pacing. This adjustment improved retention and enabled more equitable participation across regions.

Third, **communities of practice enhance** continuity beyond formal training. Previous youth-focused initiatives demonstrated limited engagement once structured activities were concluded. The Alumni Program addressed this gap by establishing a a sustained community of practice through mentorship, peer exchange, and thematic follow-up, supporting the translation of knowledge into applied initiatives over time rather than remaining at the awareness level.

Fourth, **institutionalized climate education requires co-creation with educators**. The development of teaching guides highlighted the importance of interdisciplinary collaboration with teachers and education authorities to ensure pedagogical relevance, alignment with curricular frameworks, and institutional acceptance. This co-creation approach increases the potential for scalability and long-term integration within public education systems.

Fifth, **capacity-building initiatives must be complemented by policy and financing mechanisms**. While the project strengthened skills, awareness, and networks, it was not designed to replace long-term funding or implementation of instruments for youth-led climate initiatives. This underscores the need for complementary policies and financing pathways to enable sustained action and impact.

Finally, **creative and arts-based approaches are effective entry points for early climate awareness.** The national drawing contest demonstrated strong outreach potential, engaging children and adolescents while fostering dialogue within schools and families. Such approaches broaden participation and complement more technical capacity-building efforts by making climate issues accessible and relatable at an early age.

CONCLUSIONS

The project **"Strengthening Climate Change Capacities for Children and Youth and Establishing a Knowledge Hub in Panama"** demonstrates the value of integrated, inclusive, and practice-oriented approaches to climate capacity building. By combining youth leadership development, educator support, creative engagement, and institutional knowledge systems, the initiative strengthened climate literacy and action-oriented capacities across multiple segments of society.

Beyond individual training outcomes, the project contributed to **strengthening Panama's climate education ecosystem.** It reinforced linkages between public institutions, educational actors, and young leaders, while embedding knowledge tools within national platforms such as the National Climate Transparency Platform (PNTC), supporting sustainability beyond the project lifecycle.

Overall, the experience confirms that **education and knowledge-sharing are foundational enablers of climate resilience** when designed to be accessible, context-specific, and aligned with national priorities. As climate risks continue to intensify, initiatives of this nature play a critical role in preparing current and future generations to engage meaningfully in mitigation, adaptation, and sustainable development efforts. The project offers a **replicable model** for other countries in the region seeking to strengthen climate capacities through coordinated, multi-level learning strategies.

ANNEX

To ensure transparency, knowledge-sharing, and continued access beyond the project lifecycle, key resources and public communications developed under this initiative are available through the following platforms:

CORE PROJECT RESOURCES

Project overview: Strengthening capacities in climate change for children, youth, and decision-makers in Panama

https://itaca.solutions/strengthening-capacities-in-climate-change-for-boys-girls-young-people-and-creating-a-climate-knowledge-hub-in-panama/

Academy for Young Climate Leaders in Climate Change: Information on the latest edition and access through the National Climate Transparency Platform

https://transparencia-climatica.miambiente.gob.pa/academia-cc/

Climate Knowledge Hub: Public access to structured climate learning resources

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