

# Declaration of Leticia: a manifesto for science with social impact in Latin America and the Caribbean

Since 2015, the Sustainable Development Goals (SDGs) 2030 have served as common objectives so we can achieve a better future in balance with the planet. However, the lack of conclusive achievements to date has presented governments and the scientific community with an urgent challenge. There is therefore a pressing need to design and manage innovative policies that facilitate compliance of these goals through science and collaborative work.

As young Latin American scientists, we share similar difficulties in each of our countries; being the i) **gender gap in STEM areas**, and ii) **the lack of connection between scientists, the government and society**, two of the most transversal ones. Both significantly hinder progress in achieving sustainable development goals in Latin America and the Caribbean (LAC). This manifesto is the result of the Science Leadership Program for Latin America and the Caribbean of the Global Young Academy, where 20 young scientists from LAC analyzed and concluded that we need to make female scientists visible, create innovative policies that promote their inclusion in science, and generate or consolidate collaborative networks that facilitate training for women in STEM. Also, it is necessary to promote knowledge dialogues with communities and create spaces for scientists within the Government. In addition, we need help developing science diplomacy activities with the aim of articulating science, governments, and society.

In the next two sections, we intend to showcase relevant initiatives in ours and other contexts, and propose strategies to enhance LAC's research systems as a result of the Science Leadership Program for Latin America and the Caribbean; all summarized in the Declaration of Leticia, as proof of the tenacity, leadership, and teamwork, characteristics of our region.

First cohort of the Latin American and Caribbean-Science Leadership Program (LAC- SLP) organized by the Global Young Academy, sponsored by the InterAcademy Partnership. [Science Leadership Latin America and the Caribbean - Global Young Academy](#)



**SCIENCE LEADERSHIP**  
**Latin America and the**  
**Caribbean**  
GLOBAL YOUNG ACADEMY

(the French translation does not contain figures)

## Policy brief I

# Transforming the STEM future: Visibilizing the social responsibility of young academics in Latin America and the Caribbean

### KEY POINTS

- Gender equality in STEM: gender equality in STEM is used to characterize the equality of rights, responsibilities and opportunities of women, men, girls and boys in this field of knowledge (UNESCO, 2019).
- Social Responsibility in STEM: innovative practices oriented to the training of women or those who identify as women in STEM.
- Individual social responsibility: it refers to the integral development of people taking into account their culturally chosen values. It corresponds to continuous personal improvement in different dimensions: environmental, community, market and career. It is the impact of the individual in and for society; that is, a personal development that influences social development.

### SUMMARY

Gender gaps persist in science, technology, engineering, and mathematics (STEM). Therefore, the involvement of women in STEM is essential because it contributes to the fulfillment of the 2030 Agenda for Sustainable Development and Education. This is the reason why young academics (early and mid-career researchers, inventors or undergraduate and graduate students, who are referents in their region) of different areas are concerned about bridging STEM gaps and playing an active role from their proposals of social responsibility for women; in other words, they focus on finding quality educational and employment opportunities for them.

The social responsibility initiatives shown here are all innovative actions, projects, and strategies aiming to reduce the gender gaps in STEM. In the case of Latin America and the Caribbean (LAC), there is a clear need for a systemic approach to achieve structural changes in decreasing the women gender gaps in STEM. These initiatives must involve different actors such as: Universities, business sector, government, and society, the so-called *quadruple helix*.

This policy brief aims to visibilize the social responsibility of young academics as part of a healthy scientific culture that bridges the gender gaps in STEM in the LAC regions. Herewith, we present four innovative success cases promoted by young academics in the region. Finally, we recommend four fundamental strategies to reduce the gaps in STEM: the implementation of a regional map of good practices in social responsibility, the institutionalization of official spaces for socializing innovation initiatives that benefit women in STEM areas, the promotion of transdisciplinary and inter-institutional dialogues in the regions, and the legitimization of groups of young academics that lead initiatives for reducing gender gaps.

## INTRODUCTION

In recent decades, the participation of women in the fields of science and technology has increased in Latin America and the Caribbean (Camacho et al., 2022). In some countries of the region, such as Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Panama, Uruguay, Venezuela and Ecuador, progress has been made through the formulation of policies, programs and actions that articulate gender equity with scientific and technological development. This led to a continuous increase of women in almost all scientific disciplines, except in engineering (UNESCO, 2019). Furthermore, some countries, such as Chile and Costa Rica, have formulated specific policies concerning gender equality in science, technology, and innovation: 1) Institutional Policy for Gender Equity in Science and Technology (2017-2025) and 2) National Policy for Equality between Men and Women in Training, Employment and Enjoyment of the Products of Science, Technology, Telecommunications, and Innovation (2018-2027), respectively (UN Women, 2020). Likewise, initiatives such as the strategy of gender equality for 2022 to 2025 of the United Nations Development Programme (UNDP) focused on supporting countries to accelerate progress in gender equality and women's empowerment (World Bank, 2022).

There are actions of different organizations that seek to identify the factors that contribute to the participation, achievements and progression of girls and women in STEM areas, such as the programs of UNESCO and L'Oréal *For Women in Science*, the project SAGA of UNESCO (STEM and Gender Advancement), the *TeachHER* initiative, the project of BID *Gender gaps in science, technology, and innovation in LAC countries*, among others. There are also women's academies and networks organized by disciplinary areas and by countries (UN Women, 2020). Moreover, they focus on identifying the values that motivate women's interest and commitment with STEM disciplines.

The questions that remain to be replied are: What are the specific strategies to increase the training of women in STEM areas, based on the initiatives of young people in academia? How can we replicate STEM actions in different countries of the region, adapting them to the local context? What are these internal aspects that have made these programs successful and serve to guide the academic sector?

Consequently, the objective of this policy brief is to make visible the social responsibility of young people in academia as part of a healthy scientific culture that bridges the gender gaps in STEM in the LAC regions. This document consists of the following parts: the introduction, where the topic is contextualized; the definition of the problem, which addresses current needs and outlines the advantages of reducing the women gender gaps in STEM fields; the success stories, which illustrate the experiences of the programs developed in the LAC region, and finally some recommendations are stated.

## THE PROBLEM

The inclusion of women promotes scientific excellence and boosts the quality of research results in STEM. Their contribution lies in favoring the inclusion and diversity of different perspectives that add creativity, reduce biases and promote stronger knowledge and solutions (UN Women, 2020; UNESCO, 2019). Thus, reducing the gender gap fosters female empowerment and economic benefits. It is estimated that earnings would be between 5 and 6 billion USD, if the entrepreneurship gap between men and women were reduced (World Bank, 2022).

In contrast, it has been reported that women have lower labor market insertion in STEM (IESALC, 2021). For example, some of the highest earning STEM occupations, such as computer science and engineering, have the lowest percentages of women workers (UN Women, 2020). Women remain at lower numbers in these areas of knowledge and the salary gap persists (IESALC, 2021). Giving women equal opportunities to develop and thrive in STEM careers helps to reduce the gender salary gap, improves women's economic security, and ensures a diverse and talented workforce (UN Women, 2020). However, currently, there are actions initiated by young academics, who have taken an active role in different scenarios, to involve women in order to narrow the gender gap. In addition, these actions allow improving the conditions of their environment and their quality of life (Laboratoria, n.d.). A healthy scientific culture is the well-being of those who integrate the academic community in the development process of research and innovation. This implies equality, solidarity, enjoyment, and personal satisfaction when exploring, presenting, or solving science-related questions for the benefit of the community.

Gender inclusion is a concept that is gaining more strength in public policies (Chaves, et al., 2021). In addition, this becomes transversal to promote social responsibility in innovative practices, such as niches, projects, programs, startups, ventures, accelerators or collaborative networks focused on education and with a quota of women participation. Thus, the promotion of entrepreneurship in Latin America is increasingly gaining strength and is one of the pillars that propel the development of nations (Cedeño and Dueñas, 2020).

There is a concern about closing the gender gap that still exists in the sciences, because women are still a minority in STEM knowledge (Monroy Carreño, C. and Monroy Carreño, P., 2020). According to figures of UNESCO for the year 2019, the global average rate of women researchers was 29 % and the proportion of women participation per country in that field does not exceed 27 %. (UNESCO, 2019) Moreover, the proportion of doctorate women in the world does not exceed 30%; in other words, this privilege is still reserved, to a greater extent, for men. Although there are some areas where the insertion of women is greater, such as biology; the access and permanence of women in engineering, mathematics and computer science is still low. In fact, only 35% of the total registered in this field of knowledge are women (UNESCO, 2019). Numbers are even lower in LAC, thus there is low labor demand for women in STEM areas, and low positioning in leadership and decision-making roles (IESALC, 2021). On the other hand, according to the World Economic Forum, women receive less research grants compared to the number of grants received by men and it is even more difficult for them to obtain sources of funding or capital for startups in science and technology (UNESCO, 2019).

Therefore, it is essential to promote good practices that connect the social responsibility of the quadruple helix and that are inclusive for women. However, there are few examples of initiatives that articulate these actors (UN Women, 2020).

Other determining factors are the organizational culture and the leadership of young people for implementing these innovative practices that involve women participation (Setini et al., 2020). Nevertheless, Latin America and the Caribbean have several successful schemes that show how to articulate the quadruple helix as an innovation model (CUEE, 2022; Espíndola et al., 2022; Katz and Berry, 2021). However, little is known about these experiences in the region. Therefore, it is interesting for the academic community to identify the profile of these good innovative practices based on gender inclusion and on the social responsibility where they intervene.

## SUCCESSFUL CASES

In this scenario, we present the following success stories about the social responsibility practiced by young academics as key players:

### Case 1. Laboratoria

Laboratoria is a non-profit organization, its success lies in the work realized for low-income Latin American women. It provides them with the tools to get a job, by teaching them topics related to digital products or web development, free of charge for 6 months. Once these women get a job, with their salary, they pay -for one time- an amount already established in order to give continuity to the intensive software development programs (*Bootcamp*) for other women to receive quality education.

Its motto: "Together, we transform the technology market in Latin America". This initiative was led by **Mariana Costa**, a Peruvian scientist and entrepreneur who faced an initial challenge: only 7% of web developers are women in Peru. The impact of Laboratoria is of 3000 women that completed the program and 87% of graduates who got jobs thanks to this *Edtech* initiative in the years 2020 and 2021 (Laboratoria, n.d.).

### Case 2. Women Leaders in STEAM

Women Leaders in STEM is a mentoring program in the areas of science, technology, engineering and mathematics for Latina women. The program was created by **Rebeca Vargas** in 2015 in Mexico -based on her professional experience- to contribute to the empowerment of young women. It is aimed at high school students in rural and urban areas throughout the country. This initiative consists of four basic components for the achievement of its objectives.

The first component, are the women mentors whose function is to guide the students, to help them strengthen their self-esteem and guide them to start a professional career that allows them to achieve their goals. Women mentors are professionals, working in the public or private sector or in institutions, with a minimum of three years of experience. Some have master or doctoral degrees and dedicate two hours per month for volunteering in the programme. The second component is motivational leadership courses, the third component are tasks and teamwork; and the fourth component, visits to companies and universities (Mujeres Líderes en STEAM, 2023).

Regarding the impact of the program, in the first three cohorts (2016 to 2018), of all the women who finished the program and took the college entrance exam, 98 % enrolled in STEM-related careers. The program has had a low desertion rate of 4%. In addition, they have established partnerships with different public and private institutions in the education sector and others, which support young female students from public high schools to receive academic and vocational training in STEM areas (López, 2018). Currently, there is an evident impact on thousands of women in LAC countries, and more than 100 cohorts have been completed. Women Leaders in STEM has become an active and successful network of women STEM professionals willing to support each other's professional growth, contribute to the development of their communities and promote international collaborations (Mujeres Líderes en STEAM, 2023).

### Case 3. Digital Community Centers

The Community Digital Centers (CCD, Spanish acronym) in Guatemala, came as an initiative of the Guatemalan scientist **Susana Arrechea** and other compatriots. Their purpose is to provide, indigenous women and girls in remote communities, access to electricity and internet, and training in digital and leadership skills, and finance education with cultural relevance. These centers started to operate in 2021, through New Sun Road (an organization that provides electricity and internet). Digital literacy programs are implemented for women and girls, most of them Mayan, in the local languages Q'eqchi' and Chuj. The most important aspect of this proposal is that the CCD are based on business models co-assembled with women leaders of the communities.

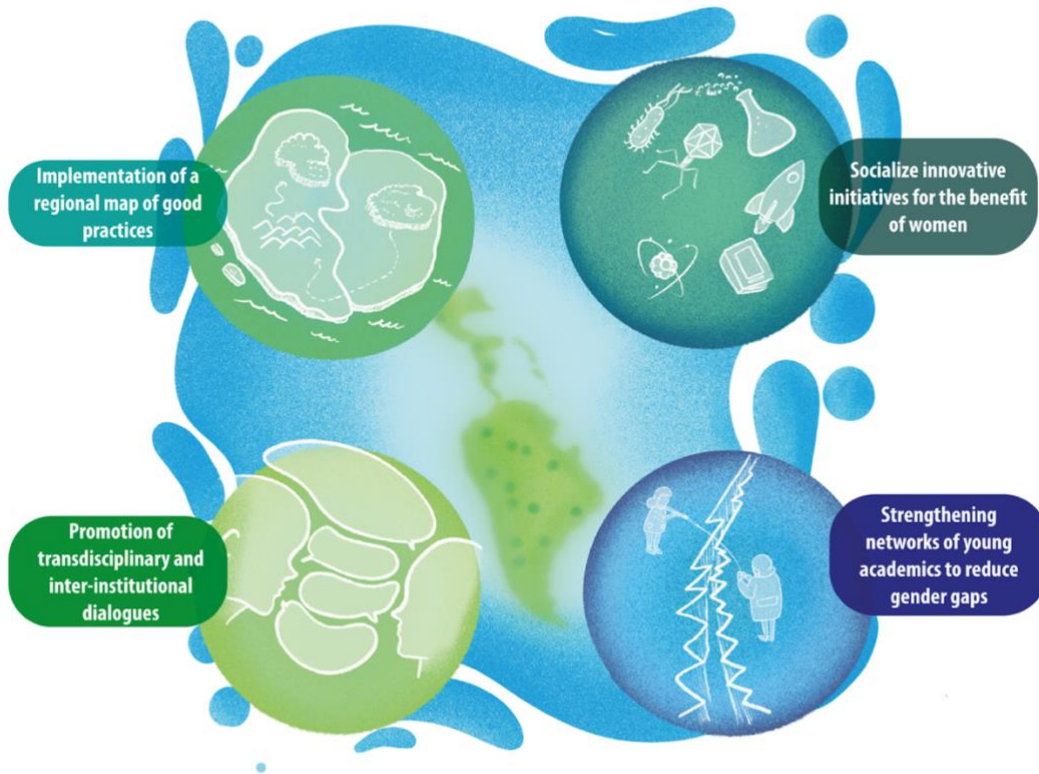
This initiative seeks to be sustainable, by training women in administrative and financial skills. In the first 18 months, they received support from New Sun Road to cover the costs and maintenance of equipment and materials. However, it is expected that in that period of time, they will reach their break- even point and become self-sustainable with their services, executing their savings plans and proper administration, as well as reinvesting their income. To date, 1360 women and girls have been trained in digital literacy. Twenty CCDs have been established and are operating in two Departments: Alta Verapaz and Huehuetenango. In 17 months of operation, 14486 services have been provided, with a total income of USD 13500. Also, 300 women were part of the committee of women leaders.

### Case 4. She is Foundation

The She Is Foundation was founded in 2016, it is a non-profit entity, whose mission is empowering girls and women in vulnerable conditions in Colombia and Latin America through entrepreneurship and STEM education, providing them the necessary tools to be agents of change in their communities. It was created by **Nadia Sanchez**, Colombian, administrator, business agent and professor at the Universidad Javeriana de Colombia.

In 7 years, 16000 beneficiaries of the programs and projects in Colombia have been trained. The foundation signed an alliance with the NASA Space Center, in order to impact the lives of girls in Peru, Colombia, Costa Rica and Ecuador; that breaks the paradigms of poverty. The main goal is to empower, motivate and inspire them to become icons and role models for millions of girls. This program has a virtual mode; academic modules will be developed, through an *e-learning* platform, focused on STEM skills reaching 100 girls between 9 and 15 years old from the 32 Departments of Colombia (She is Foundation, 2022).

## TRANSFORMING THE STEM FUTURE: VISIBILIZING THE SOCIAL RESPONSIBILITY OF YOUNG ACADEMICS IN LATIN AMERICAN AND CARIBBEAN

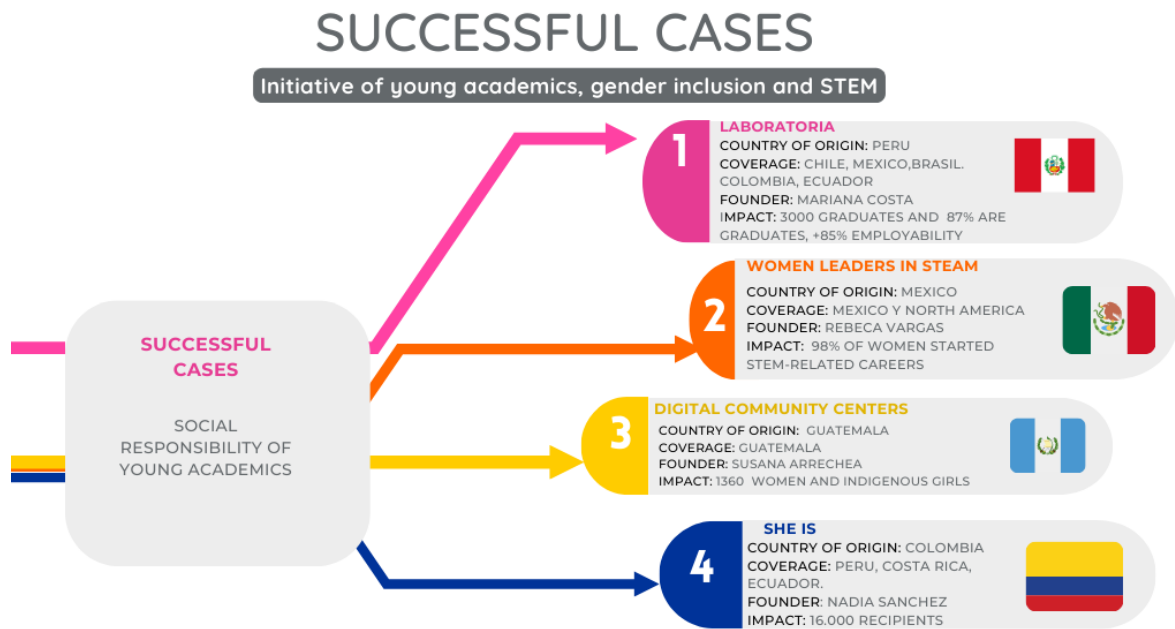


**Figure 1.** Recommendations for transforming the STEM future in Latin American and Caribbean

### Determinants of Success

Some key elements of the successful cases in the region were the following:

- Have a direct impact on reducing the gender gap for women, seeking equality and labor insertion.
- The innovative strategies underpin their value proposition in the training of women in STEM areas.
- The initiatives seek to address a need in the Latin American region.
- They are articulated with the civil society (donations or volunteers), the institutions and companies that support and take action in social responsibility initiatives.
- The spirit of motivation generates social responsibility in other young people, based on the solutions to the needs of their community.



**Figure 2.** Successful cases of social responsibility of young academics from four Latin American countries which describe their impact, the coverage and their founders.

## RECOMMENDATIONS

**Strategy 1. Implementation of a regional map of good practices in social responsibility related to reducing gender gaps in STEM. For developing this strategy is required:**

- Generation of a virtual platform for the dissemination of good innovative practices (Gaete et al., 2019). Identification of young academics who have an impact through their social responsibility as main actors in their initiatives. We propose to do this through the calls for participation in the UNESCO Portal. This is beneficial because young people take action with their initiatives in reducing gaps in STEM.
- Creation of innovative state policies in terms of the tripartite: initiatives of young academics, gender inclusion, and STEM. This is evidenced by specific actions of knowledge exchange among stakeholders, and effective, sustainable actions, reproducible through indicators (Labor Organización Internacional del Trabajo, 2022).

**Strategy 2. Institutionalization of official spaces to socialize innovation initiatives for the benefit of women in STEM areas. For developing this strategy is required:**

- Political will at multiple levels (universities, companies, governments, and society) to promote coordinated work for training, funding and scholarships management, that enable



women to access and continuation in education, as well as support and follow-up for their positioning in the labor market (CUEE, 2022).

- The generation of new spaces for the exchange of significant experiences of social innovation or entrepreneurship in terms of gender, with training paths in STEM, through entrepreneurship camps-BootCamps (Laboratoria, n.d.) or the inclusion in networks and mentoring programs as an educational strategy (Comunidad Mujer, 2002).
- The formation and consolidation of collaborative networks, in-person and virtual spaces, in Latin America and the Caribbean for the visibility, recognition, and grants management for the training of women in STEM areas (IANAS, 2021; Red Colombiana de Mujeres Científicas, 2019). The benefits are the diffusion, visibility and recognition of their contributions related to the promotion of gender equity, the advancement of innovation and the empowerment of women.

***Strategy 3. Promotion transdisciplinary and interinstitutional dialogues in the region. For developing this strategy is required:***

- The participation in awareness-raising events for the academic-scientific community, such as programs or workshops about the articulation of different knowledge types in the development of innovation proposals for the benefit of women. This is reflected; for example, in cooperation events of inter- institutional organizations (Sebastián, 2019). For our case, UNESCO.
- The implementation of good practices such as the success cases mentioned before, through 1) evaluation with indicators 2) identification on the regional map 3) replication in other countries and/or regions.
- The former requires an analytical framework of inter- institutional dialogue processes (Herrera-Kit et al., 2021; Natera and Dutrénit, 2017). The promotion of community spaces allows the participation of women, whether or not involved in science, for them to express their opinions on the subject. All this contributes to generating integral solutions and advancing towards more just, inclusive, and equitable societies for women.

***Strategy 4. Strengthening networks of young academics, who lead initiatives to reduce gender gaps. For developing this strategy is required:***

- A revision of assessment metrics in national research systems about the impact of the participation of young professionals in mentoring, leadership, and outreach activities.
- Development of calls for proposals aimed for young academics, that articulate the reduction of the gender gap with a focus on STEM areas.
- Creation of badges for young academics, which can be recognized in the science platform portal of their countries or similar systems. The benefit of developing this strategy is the empowerment and active participation in the reduction of gender gaps, as well as the recognition and transparency of their efforts and contributions.

## **CONCLUSION**

In conclusion, in order to promote a healthy scientific culture with social responsibility, it is necessary to visibilize and promote the efforts made by some young researchers, who have managed to solve a specific need in the region of Latin America and the Caribbean, for example, in reducing gender gaps in STEM areas. To magnify these efforts, it is necessary to develop a regional

map of good practices, socialize innovation initiatives, promote transdisciplinary and inter-institutional dialogues, and strengthen youth initiatives in academia as an impactful strategy to reduce the STEM gender gap, the development of a more just and egalitarian society, and the recognition of the contributions in favor of women.

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## Policy brief II

# Advancing sustainable development in Latin America and the Caribbean through science-society-government cooperation

### KEY POINTS

#### Promotion of knowledge dialogues (intercultural dialogues)

- Effective communication and dissemination of science, through capacity-building programs and assertive science communication techniques, explaining its purpose, findings and impact.
- Dialogue with communities, through the creation of spaces for exchange between researchers and the community, to draw on their experience, understand their needs and create relevant solutions to local problems.
- Education with an interdisciplinary approach, giving visibility to the impact and scope of interdisciplinary projects, along with the advocacy of this approach by national governments and international funding organizations.

#### Presence of scientists in the Government

- Internships for scientists in public institutions so that communication barriers can be identified and critical points of public management be understood. This would allow that scientific knowledge reaches public policy and decision-makers in a clear and relevant manner.
- Public management training opportunities for researchers so they can access relevant positions in ministries and/or science and technology councils of their country.
- Creation and/or strengthening of civil organizations that bring together researchers in order to facilitate dialogue between actors from both public and private sectors, as well as the participation of the scientific community in government decision-making.

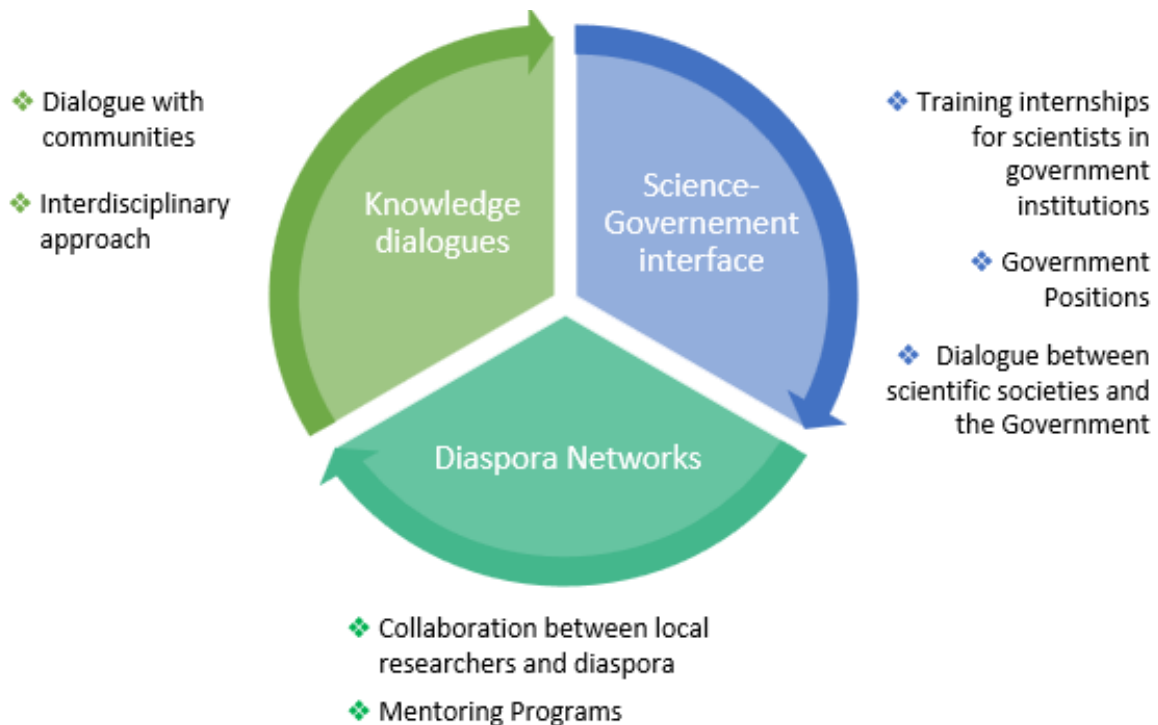
#### Building and promotion of scientific diaspora networks in favor of scientific diplomacy

- Promotion of collaborative work between local researchers and the scientific diaspora fostered by Latin American governments through the creation of public policies of science diplomacy. This would support the building, activity, and sustainability of said networks of researchers.
- Creation of mentoring programs led by researchers from the diaspora to the scientific community of their country of origin.

### SUMMARY

The lack of communication between science, government and society has created difficulties in achieving development goals in Latin America and the Caribbean. This policy brief stems, therefore, from our personal and collective cause, as young Latin American scientists, to address this barrier and maximize the appropriation of knowledge for the continuation of our species and the care of

our planet. This vision includes strategies that seek to: (i) design scientific studies based on the dialogue with our local communities and their realities, recognizing their intrinsic characteristics, strengths and needs, (ii) promote the participation of scientists in the public arena as a means to inform the design of evidence-based public policies, (iii) foster collaborations between the Latin American scientific diaspora and the local scientific community through the building of well-established networks and the promotion of science diplomacy strategies. In this work, we propose the aforementioned approaches and present policy briefcases of proven success as evidence that large-scale implementation of science integration strategies will accelerate sustainable development in Latin America and the Caribbean.



**Figure 1.** Graphic representation of key points proposed to promote science-society-government cooperation for the advancement of sustainable development in Latin America. (Own elaboration)

## THE PROBLEM

The disconnection among Latin American scientists impairs them to be relevant actors in the development of a knowledge society that prioritizes the needs of people and influences the creation of public policies (López-Verges, et al., 2021). The social context of our region is intersected by complex inequality, which halts its ability to reach development goals such as: social transformation and peace, environmental justice, food security, human development, closing of economic, gender, age, ethnic, rural and academic gaps, etc. Science must contribute to decision-making processes looking for solutions to the problems of Latin American countries from a territorial approach and, to this extent, the research agenda must be nourished and informed by the needs of society, including historically excluded communities from the production and benefits of scientific work. Hence, there is a pressing need to foster convergence and openings in the Latin American sciences

that strengthen their integration and cooperation with society and government to accelerate the sustainable socioeconomic development of our countries.

## **THE ESTRATEGIES:**

### 1. Knowledge dialogues

- Dialogue with communities strategy:

Science, from a social justice perspective, must link the geographical, social and historical complexities and realities of the local communities with its object of study. This holistic approach could only be achieved by the participation of actors with diverse knowledge (Barragán & Amador, 2014). Said participation allows us to identify not only social problems, but also to foster a new connection between science and society through the acknowledgment of community assets (Montes, et al., 2015). Thus, knowledge dialogues become a nodal point for listening and acknowledging both scientists and communities (Castaño Pineda, et al., 2023), whilst establishing transformational research based on experiences resulting from the connection with the local communities, their territory, as well as with their own idiosyncrasy and beliefs. An example of this is the study by Orozco et al., 2020, which explored the popular knowledge that families in rural areas of Colombia had regarding health. The research found that although these families used certain elements of Western medicine, they mostly used natural methods described in the study; especially, the management of local plants. This type of research can contribute to the design of the training curriculum of health professionals, and public health regulations. (Orozco et al., 2020).

- Interdisciplinary science strategy:

Establishing knowledge dialogues through interdisciplinary science implies the collaboration and integration of knowledge from various disciplines (Arboleda-Alzate & Becerra Hernández, 2023). This is necessary in order to address complex problems from different perspectives. To achieve this, researchers must assume an epistemological opening, which requires critical alternative approaches (Calderón & Betancurth, 2015). The ideal strategy includes identifying a common theme, building an interdisciplinary team of experts, defining clear objectives, fostering an atmosphere of respect and openness, facilitating communication and collaboration, integrating knowledge, promoting interdisciplinary education, evaluating and adjusting the process, and sharing the results in scientific publications. Despite the inherent challenges, effective communication and mutual understanding will result in innovative and significant results. In line with this, an analysis by Sun Y et al., 2021 of almost 45,000 funded projects in the United Kingdom, found that studies carried out by interdisciplinary researchers achieved better long-term financial results than non-interdisciplinary projects (Sun Y et al., 2021). It is not surprising, therefore, that countries such as the United States or the United Kingdom have implemented national programs that promote the funding of interdisciplinary projects through their science agencies such as the National Science Foundation and the UK Research Institute, respectively.

### 2. Science-Government interface

- Internship in the public sector strategy:

In countries like Spain or the UK, scientists are appointed for government advisory councils that provide regulatory and technical advice in its exercise of decision-making (Freire, et al. 2023). Their advice is deemed necessary in highly complex situations, which requires the assessment of multiple sources of information (Jarvis, 1998). A recent example is the Spanish initiative “Ciencia en el Parlamento” (“Science in Parliament”), winner of the first “Science for Politics” Euroscience prize. This initiative has several programs, including the “Science Meets Regions Comunitat Valenciana 2023” pairing program, which brings together scientists and politicians from Valencia in order to give a joint response to local challenges with new evidence-based policies.

To ensure a successful collaborative work, scientists must learn to function in the political sphere by communicating their knowledge in an accurate yet accessible manner. This could thus prevent the given information from being misinterpreted or misused (Sugiono, 2021). On the other hand, politicians get often frustrated by the high amount and debatable relevance of the information received. A two-way learning could be achieved through internships for scientists in government institutions, allowing them to identify communication barriers, understand the critical steps in project formulation, and help scientific knowledge to reach decision-makers in a clear and concise manner. Certainly, the internships sponsored by the Inter-American Institute for Global Change Research (IAI) respond to this need under the [Science, Technology, Policy \(STeP\) Fellowship Program](#). Thanks to the agreement that exists between the IAI and the member countries, the program places selected scientists (fellows) in government institutions of their home country. There, they receive training, mentoring, and hands-on experience working at the science-policy interface.

- Scientists in Government strategy:

Government institutions should be composed of professionals who can carry out policies with both technical and public service knowledge. Scientists with previous training and/or hands-on experience in public management could be thus considered for full-time government positions. A good example of this occurred during the COVID-19 pandemic in the United States, where the presence of specialist scientists, such as Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases (NIAID/NIH), was key for decision-makers not only of that country but also for other countries that took his advice as a reference. Likewise, an analysis of public policies from 114 countries between March and May 2020 revealed that their design and formulation required continuous access to scientific data (Yin, et al., 2021). Although the policies analyzed correspond to a pandemic context, this finding highlights the need to have representatives of the scientific community in the Government. Furthermore, in countries with a good alignment between politics and science, such as Germany and South Korea, the population showed more trust in their government and thus achieved better management of the pandemic (Bangerter, et al., 2021). Beyond extreme situations, such as humanitarian crises, natural disasters, etc., our society would consistently benefit from more effective and sustainable development policies, with accurate sources of information from experts in different areas.

- Scientists organized as societies before the Government:

Most scientific organizations aim to promote the professional development of their members, increase public engagement through effective science communication, among others. Often, these organizations are well regarded by the Government. This allows them to help solve shared local problems (Escobar, 2010) such as the defense of democracy, the demand for informed solutions to



existence threats such as the climate crisis, or the call for structural changes in the science system itself (Hendricks, et al., 2021). We can cultivate the already established relationship between scientists organizations and decision-makers at local, regional, and national levels, to show the importance of our voice and technical knowledge in the creation and execution of public policies. The government must see science as a fundamental tool for shaping the country. At the same time, it is our duty as scientists to deal with problems that we are able to help with. A recent example in our region is the [Gremio Doctoral Colombiano](#) (Colombian Doctoral Guild), who managed to help [persuade Colombian congressmen to desist from presenting an animal protection bill](#), which -due to its ambiguity- could seriously hinder research in their country. The presence of the scientific community before the Government, through organized groups, is therefore key for the development of the society to which they belong.

### 3. Scientific Diaspora

- Collaborative Research strategy:

The scientific diaspora has the capacity to generate and sustain international collaborations with the scientific community and research centers in their country of origin. A good example is the [RAÍCES Program](#) in Argentina, which encompasses the different types of researchers networks formed in 20 countries (until July 2023). This program maps Argentinian researchers and organizes inter-network meetings to identify opportunities for collaboration on cross-cutting issues. These collaborations keep alive the diaspora's commitment to their native country, without necessarily having to move back (brain linkage) (Shin & Moon, 2018). Likewise, the diaspora can work with the Government authorities of the country of origin to promote scientific cooperation tailored to the local reality, and collaborate in the creation/improvement of public policies for science and other issues of national interest, including science diplomacy. The latter is defined as that set of actions that are aimed at addressing: i) national needs, ii) cross-border interests, and iii) global challenges (Turekian, et al., 2018). A relevant example is FECYT, the Spanish science and technology agency, which has been working on the implementation and strong promotion of science diplomacy hand in hand with its diaspora in key countries (Moreno, et al., 2017). In Latin America, diaspora organizations already interact with Government actors, and are active agents of science diplomacy without, unfortunately, responding to any strategy of the country of origin (Echeverría-King, et al., 2022). This emphasizes the need to establish policies and programs to link the scientific diaspora with the interests of the countries. This could promote the development of resources and conditions for the return of the diaspora to their home country (brain circulation) (OECD, 2007).

- Mentoring with scientific diaspora:

Government and non-state actors must seek the organization and communication with the scientific diaspora through, for example, mentoring systems (Tejada, 2007). Diaspora groups can broaden dialogues and contribute to equity in scientific collaborations between the Global North and South by giving voice and value to Latin American contexts, research questions, and professional development conditions and environments, as they have privileged information about their country of origin; generally from the Global South. This facilitates the support that scientists from a country with equipped laboratories and resources abroad can offer to students and scientists from their home country. Mentoring strategies to benefit Latin American students or professionals can include conceptual orientation of their research, guidance for applying to training or university programs,

providing information of different funding sources for scholarships, job opportunities, building of networks, or even supporting the overcoming of language barriers, etc. (Carneiro, et al., 2020). A clear example is [Neurodiáspora Colombia](#), an initiative of the Colombian College of Neurosciences (COLNE), which brings together scientists from the diaspora who act as facilitators for the formation of research networks, and as mentors. Through a virtual platform, Colombian students who have an interest in areas linked to neurosciences can apply and become mentees. Another good example is [REPU](#) (Research Experience for Peruvian Undergraduates), a community of Peruvian professionals abroad committed to strengthening STEM capabilities in Peru, particularly the training of young undergraduates. REPU volunteers help organize research internships in the best centers and universities in the world, as well as mentoring, and other activities that promote the professional development of young Peruvians selected for the program.

## CONCLUSION

As early and mid-career scientists in Latin America, we want to lead initiatives able to stem a science-society-government cooperation. This, in turn, could promote the establishment of public policies and programs that reinforce their interaction. There is a critical need to recognize the importance of transcending the boundaries of the traditional work of each sector if we aim to advance human flourishing and the sustainable development of our region. Based on the cases of proven success mentioned throughout this policy brief, we consider the three main strategies proposed herein will prove useful in this endeavor.

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#### **Further reading:**

Learn about Interdisciplinary Research: <https://new.nsf.gov/funding/learn/research-types/learn-about-interdisciplinary-research>

Get support for your project: <https://www.ukri.org/apply-for-funding/how-to-apply/preparing-to-make-a-funding-application/if-your-research-spans-different-disciplines/>

Science in Parliament: <https://cienciaenelparlamento.org/>

12 scientists and 14 politicians: the faces of the "Science Meets Regions Comunitat Valenciana 2023" matching program: <https://cienciaenelparlamento.org/12-cientificos-y-14-politicos-las-caras-del-programa-de-emparejamiento-science-meets-regions-comunitat-valenciana-2023/>

Science, Technology, and Policy (STeP) Fellowship Program: <https://www.iai.int/en/step>

Colombian Doctoral Guild: <https://gremiodoctoralcolombiano.wordpress.com/>

Public statement regarding bill 004 of 2023c:

<https://twitter.com/JuanKarloslos/status/1692179530814005333?t=TXmPtaeZm3-vylb8tYQnjg&s=08>

Networks of Argentine researchers, scientists, and technologists abroad:

<https://www.argentina.gob.ar/ciencia/raices/redes-exterior>

Neurodiaspora: <https://neurodiaspora.colne.org.co/>

REPU Program: <https://www.repuprogram.org/>

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