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KONRAD ADENAUER STIFTUNG

SPDA

Innovation and Technology in the context of Climate Change and Biodiversity Conservation in Latin America

Critical issues and recommendations

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I. Background

The Konrad Adenauer Foundation (KAS) and the Peruvian Society for Environmental Law (SPDA), organized three webinars with well-known experts from Latin America to exchange ideas on **the current role of creativity, technology and innovation in climate change mitigation/adaptation and biodiversity conservation**.

In a world seeking to free itself from the systemic crisis caused by Covid-19 and reverse its impacts, the idea of " building back better" and resetting a global sustainable development agenda is gathering strength. This comes, paradoxically, together with climate change negationists and growing nationalisms that openly ignore and undermine the need for global responses to global environmental and health crises.

A select group of regional experts, from different backgrounds and involved in various types of projects and programs where creativity, technology and innovation play a key role, have highlighted a series of critical points arising from the discussions and proposed some recommendations that seek **to better understand ways to generate effective and efficient spaces and enabling conditions for innovation and technology to thrive and flourish as problem-solving tools.** Not as "silver bullets" but as **part of a package of measures that contribute to a common effort and goal: mitigate climate change, generate effective adaptation options and reverse biodiversity loss patterns**.

Without seeking an absolute consensus, these critical dimensions and recommendations are an attempt to highlight issues that are often overlooked at complex times for many countries, in order to integrate them into national and regional policy discussions on development, climate change and conservation in general.

II. Highlighted critical points

Of the many paradoxes Latin America presents, one is particularly noticeable. Arguably the worlds center of cultural and biological diversity, with very visible calls over time by current governments to generate innovation and technology related to biodiversity and climate change, the results - with some exceptions - show **a neglect of science and technological development - particularly in the environmental field**. This is clearly reflected in limited or almost non-existent public funding allocated to research and development and the promotion of knowledge and innovation in general.

The wealth of biodiversity and cultural diversity does not fit in with a poorly motivated national scenario, not articulated with the private sector, somewhat gray, opaque and not very vibrant in terms of the application of science and development of innovation and technology to generate drivers of well-being for societies, except in very exceptional and limited spaces and contexts (e.g. through universities, research centers or " knowledge cities" like places that have been established in some countries like Panama and Brazil).

In most cases, there seems to be a kind of "disconnection" between public policies and regulations with the scientific, technical and technological advances, which are either not integrated into national discussions, are poorly understood and promoted, or are inadequately regulated.[1] Instead of being a transversal axis of the general policies of governments in office, **technology and innovation are just "one more element" which is highlighted only when circumstances warrant it, without a clear understanding that in technology and education lies the future of viable societies**.

In addition to this, there is a permanent instability in many public institutions - including those dedicated to promoting and encouraging science and technology - which prevents coherent and long-term programs. This responds to a major problem in Latin America with respect to the State' s role and functions, accompanied by seemingly endless political and ideological discussions that overshadow the possibilities to objectively appreciate how science and technology can play a fundamental role in generating progress, including on environmental issues (e.g., climate change, biodiversity

1 The case of regulatory frameworks on access to genetic resources and benefit sharing - derived from international commitments under the Convention on Biological Diversity (1992) - is particularly noticeable and striking, with publications such as Nature and Science calling for reconsideration of restrictions and disincentives generated by countries as a result of over and excessive regulations and their discouraging effects on research, particularly at the national level. See, for example, Laird, S., Wynberg, R., Rourke, M., Lawson, C., Ruiz, M. Rethinking the Expansion of Access and Benefit Sharing. Policy Forum. Science. March 2020, Vol. 367, Issue 6483

protection, etc.). In this context, advances are often made *despite* institutions that are not very receptive nor prepared and capable of expanding research, innovation and technological development, regardless of the political debate or ideologies prevalent in current governments.

For the purposes of this expert group sessions, it has been proposed that environmentally relevant technologies and innovations (e.g., to mitigate climate change or reverse biodiversity loss) can be broadly classified into three main categories: **"hard" technologies, social innovation and traditional knowledge/technologies**. Repeatedly, in combination, they enable effective, efficient and equitable solutions to environmental problems at different scales, from the very local to more national. As simple examples of this classification, the expert group has mentioned the application of:

- Agro-climatic warning systems
- Applications for the detection and reporting of illegal logging or illegal mining
- Taxonomic classification using genomic techniques
- Sequencing and gene editing for crop improvement
- Real-time ecosystem satellite mapping
- Initiatives that integrate local knowledge with "modern" technology for climate change adaptation purposes

These technologies, types of "social innovation" or traditional knowledge or local knowledge, are part of the arsenal that conservationists, governments and local communities, including indigenous peoples have in the context of growing and increasingly complex challenges that environmental deterioration poses, including as a result of changes in climate patterns.

As already mentioned, rarely do these technologies or approaches constitute "silver bullets" on their own. On occasions, especially due to excessive techno-centrism, technologies and their forms of application can eventually undermine their purpose as solutions and become problems in themselves (e.g., Green Revolution or geo-engineering). Possibly social innovation and traditional technologies/knowledge where Latin America has certain competitive advantages and has experienced applied solutions proven to be effective over time in adaptation and biodiversity conservation in particular.

The responses of innovation and technologies to environmental problems, in this case, respond to or are integrated in a complex social scheme of interests, biases and power relationships regarding their development and implementation, and are rarely "neutral" in the strict sense. However, they are tools that since the appearance of Homo sapiens, in an objective and measurable manner, have transformed and, in general, improved human living conditions in all aspects including health, hygiene, transport, production, etc.[2]

2 See, Pinker, S. (2018) *Enlightment Now: The Case for Reason, Science, Humanism and Progress*. Viking, New York.

III. Some recommendations

1. Compliance with existing regulations.

Although it has been repeated insistently in different spaces, it is important to reiterate the importance of the dimension of application/implementation/ compliance of public policies through norms and regulations, including research and development, promotion and dissemination of technology and innovation, as the pillars of future prosperous and healthy societies. In Latin America, the problems associated to public policies and regulations **are not so much their absence or non-existence, but, in addition to practices which often favor corruption and impunity, their rather limited application, also verified in the context of promoting research and technological development - with obvious distinctions between countries**.

2. Restoration

For Latin America in particular, not only the conservation process per se is critical, but, increasingly, restoration as a major objective that can be achieved by applying existing practices and technologies according to contexts, including through agroclimatic information, for example, early warnings and adequate knowledge management, including local knowledge, at different levels. The Decade of Ecosystem Restoration 2021-2030 offers a great general framework through which to address policies, standards and appropriate responses from innovation, including social, and advanced or "hard" technologies.

3. Food security

It is necessary to prevent or minimize the negative effects of climate change in agrobiodiversity, including food and relevant industrial crops through appropriate treatment of adaptation and acclimatization. Research is needed in ways to trigger the genetic potential and responses of agrobiodiversity, including wild crops and their "hidden" useful variations. [3]

3 This is often known as a "gradual negative response to nutria fertilization."

4. Marine ecosystems

Marine ecosystems and fisheries have historically been overlooked in national conservation policies. The need to generate data and information, and manage that which is already in repositories, is a pending and urgent task in most countries of the region, particularly considering the importance of the ocean in the context, for example, of food security and climate change.

5. Visibility of successes

It is essential to make the multiple examples visible in a more extended manner, even on reduced scales, as a result of complex geographical, social and cultural conditions - of how different forms of innovation and technology have been applied in Latin America, in the area of climate change and biodiversity conservation. **This visibility can be the first step in a broader process of recognition, replication, scaling up - according to the circumstances - and analysis of the enabling factors that allow an innovation or technology to enhance its positive impacts and mitigate eventual adverse effects.**

6. Corruption

Corruption has repeatedly emerged as a cross-cutting problem that inhibits positive action and adequate responses for mitigation/adaptation and biodiversity conservation. Although it is not a new problem, it is beginning to be discussed more openly and associated with areas that were previously kept or preferred to be kept aside from its inclusion, such as limiting technological application options, civil society participation in conservation actions, the presence of international cooperation, among others. Permanent denouncement and citizen participation, as well as the application of technology and open access information mechanisms are sometimes the best means to initially contain this problem and then denounce it.

7. Transformational change

Due to circumstances of present times, where the environmental crisis severely threatens the viability of the planet medium/long term, conversation on creativity, innovation and technologies takes on special relevance due to the widespread belief that solutions will inevitably come from somewhere and in some way as a product of human ingenuity. **Along with this creativity and ingenuity, transformative and**

far-reaching changes are required in people's own ways of behaving, which, in the end, will have the required impact to mitigate or, in the best-case scenario, reverse the visible trends of biodiversity loss and contribute to climate change.

8. Educational models

Related to the possibility of changes in attitudes, behaviors and ways of viewing the world, it is essential to encourage educational forms and models - at different levels, especially among children (boys and girls) - that will trigger **profound changes and new ways of viewing the world, the economy and social relationships, perhaps taking advantage of the Covid-19 crisis itself and the impulse to return and restart the path to sustainable development in a better manner**. Models such as "TiNi: Land of Children and Youths"[4] are the kind of innovation that seek not so much to positively change present generations, but the generations to come, so that conservation and sustainable behaviors become a natural part of social and environmental relationships.

4 See, ***https://www.aniaorg.pe/tini***

IV. Experts

- ***Bruno Monteferri (SPDA- Perú):***
  Lawyer, Graduate from Pontificia Universidad Católica del Perú, with a Diploma on Integrated Coastal Zone Management from Universidad de Guadalajara and a Masters in Conservation Leadership from Cambridge University. At present, Director of the SPDA Marine Governance Program and We Conserve by Nature Iniciative.

- ***William Roca (CIP-CGIAR):***
  Cell Phisiologist of Plants and Cytogenetics with a Masters and PhD from Cornell University, U.S.A. Visiting Lecturer of Universidad Nacional Agraria la Molina (UNALM) and External Consultant of Centro Internacional de la Papa (CIP).

- ***Mariana Varese (WCS - Perú):***
  Natural Resources Economist of Pontifica Universidad Católica del Perú. Has a Masters in Latin American Studies from University of Florida. At presente is the Director of Amazon Landscapes at the Wildlife Conservation Society (WCS).

- ***Carmenza Spadafora (INDICASAT – Panamá):***
  Molelcular Biologist from Eastern Michigan University, with a PhD in Biomedicine and Parasitology from Universidad de Granada España. Was the coordinator and researcher of Instituto de Investigaciones Científicas y Servicios de Alta Tecnología (INDICASAT) de Panamá and at present is the Coordinator of Centro de Biología Celular y Molecular de Enfermedades (CBCMe) in Panama.

- ***Maria Elena Gutierrez (ACCA – Perú):***
  Industrial Engineer of Universidad de Lima, with a Masters in Sustainable Development and Biology Conservation from University of Maryland (U.S.A.) At present is Executive Director of ACCA.

- ***Tarsicio Granizo (WWF - Ecuador):***
  Biologist from Pontificia Universidad Católica de Ecuador. Has studies in Environmental Audits and Environmental Business Planning from Instituto de Estudios Ecológicos de Málaga, España. Was Minister of Environment between 2017 and 2019. At present is Country Director of WWF Ecuador.

- ***Roberto Vides (FCBC – Bolivia):***
  Conservation Biologist. Has a Masters in Wildlife Management and Doctorate in Biological Sciences, with a specialization in Population Ecology. At present is the

Executive Director of Fundación para la Conservación del Bosque Chiquitano in Bolivia and Professor of Universidad para la Cooperación Internacional de Costa Rica.

- ***Avecita Chicchon (Fundación Moore):***
  Biologist from UNALM, with a PhD in Social Anthropology with an emphasis on Natural Resources and Conservation from University of Florida, Gainesville. Has been Program Official of the MacArthur Foundation, Director of the Wildlife Conservation Society and at present is the Program Director of Iniciativa Andes-Amazónica of the Gordon and Betty Moore Foundation.

- ***Juan Torres (CIZA UNALM – Perú):***
  Biologist from UNALM, with a Master in Ecology from Universidad Nacional Autónoma de México. Main Professor at UNALM y Director of the Centro de Investigación de Zonas Áridas (CIZA).

- ***Wilfredo Rojas (PROINPA - Bolivia):***
  Agricultural Engineer from Universidad Misael Saracho – Tarija, Bolivia. Has a Masters in Plant Sciences from Universidad Austral de Chile. Expert in Plant Genetic Resources and Agrobiodiversity Management. Investigator of Quinua and Cañahua Andean Grains. At present is the Andean Regional Coordinator of Fundación PROINPA, based in La Paz, Bolivia.

- ***Manuel Ruiz Muller (Consultor SPDA/EKLAS KAS):***
  Environmental Lawyer. Graduate from Pontificia Universidad Católica del Peru, with a Masters in Competition Law and Intelectual Property from the same University. Was Director of the SPDA International Affairs and Biodiversity Program from 2000 to 2015. At present is an independent consultant.

- ***Joaquín Leguía (ANIA – Perú):***
  Bachellors Degree from Cornell University, with a Masters in Environmental Management from Yale University. Founder of Asociación para la Niñez y su Ambiente (ANIA), and driver of the idea “Active Empathy for Life” reflected on regional initiatives such as “TiNi: Land of Children and Youths”.

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