Futures 142 (2022) 103014

Contents lists available at ScienceDirect

Futures

journal homepage: www.elsevier.com/locate/futures

Climate-resilient and regenerative futures for Latin America and the Caribbean

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ARTICLE INFO

Keywords:
Sustainable development
climate change
COVID-19
futures
scenarios planning
Latin America and the Caribbean
regeneration
SDG 13
future-proof business
SDGs
nature-positive
backcasting
Colombia
Brazil
Peru
Bolivia
Mexico
Chile
Jamaica
future-positive
incentives
multi-actor
regenerative future

ABSTRACT

Few events have had an impact as the global crisis caused by COVID-19. However, prior to the pandemic, Latin American and Caribbean (LAC) countries already had severe problems in terms of inequality, environmental degradation, and dysfunctional political systems. Added to this are the growing challenges that climate change poses for this highly vulnerable region. This historic turning point represents a new call to consider future studies to re-imagine and reinvent alternative futures for the LAC region. For this paper, we conducted an in-depth qualitative futures study to identify how Latin American and Caribbean countries could build long-term resilience, focusing on adaptability to climate change risks, considering existing sustainable development challenges and the detrimental effects of the COVID-19 pandemic on the economic, environmental, and social aspects. This study's findings provide recommendations for policymakers and decision-makers to achieve sustainable futures for LAC. Finally, it reflects on the value of collective action for a future-proof region.

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https://doi.org/10.1016/j.futures.2022.103014
Received 4 August 2021; Accepted 26 July 2022
Available online 30 July 2022

1. Introduction

Few events have had an impact as the most recent global crisis caused by COVID-19. By August 2021, the virus had taken over 1.3 million lives in the Latin American and Caribbean (LAC) region, accounting for 32% of the global casualties, although the region represents 8.4% of the global population (WHO, 2021). Furthermore, over 22 million people have been pushed into poverty, 8 million have become extremely poor (CEPAL, 2021a), and thousands of companies have been put into bankruptcy. Although by August 2021, the economic projections seem more optimistic, experts from the Economic Commission for Latin America and the Caribbean argue that growth estimates will not be enough to revert the adverse effects the pandemic has had in LAC countries (CEPAL, 2021b).

The pre-existent structural problems of the region, inequality, unemployment, vulnerability and dependency (Mohieldin et al., 2022), have gotten worse and do not seem to recover completely (CEPAL, 2021c). The gap is growing amongst those who benefit from the crisis and those struggling to fulfil their basic needs (Gonzalez-Perez et al., 2022). Additionally, political polarisation and mistrust in official institutions have worsened the situation (Gonzalez-Perez et al., 2021, as cited in Mohieldin et al., 2022). The conjunction of a turbulent international context and difficult circumstances within the countries of Latin America heralds a critical situation for the region (Mohieldin & Shehata, 2021).

Structural development issues in Latin America and the Caribbean have also had an impact on the regional management of its biodiversity. The LAC region is known for its abundant and diverse biological wealth (IPCC, 2002 p.30). However, the influence of traditional models of development and the region's insertion into the global market has instilled a divergence between economic and environmental goals.

Managing and taking advantage of its natural resources to promote socio-economic development, while maintaining biodiversity as a pillar for competitive advantage and the wellbeing of its population is a challenge for which a solution has not been yet defined in the region (Aguilera et al., 2017; Cuervo-Cazurra et al., 2019; Gonzalez-Perez & Velez-Ocampo, 2014; Gutiérrez-Viana et al., 2013; Hult et al., 2018; Velez-Ocampo et al., 2021). This seemly contradictory dichotomy between economic and environmental goals, is the foundational dilemma of sustainable development (Gomez-Valencia et al., 2022).

The Intergovernmental Panel on Climate Change of the United Nations has highlighted the fragility of the region regarding climae change and that biodiversity loss (IPCC, 2002; Higgins, 2007; CDB, 2016). The drop-in activity due to curfews and restrictions gave only a brief relief to nature. However, emissions have gone back up with the economic reopening, and prospects are not optimistic about pollution and emissions in the region in the following years (CEPAL, 2021c). Climate change has been widely established as a driver for change shaping futures in most areas of life and at scales ranging from the individual to the global (Kumpu, 2013). It is a particularly future-sensitive issue over which worry is based on "predictions, projections and scenarios concerning greenhouse gas emissions, the material consequences of rising concentrations of these greenhouse gases in the atmosphere, and the social consequences of changes to the earth's climate patterns" (Kumpu, 2013). In the same line, according to the Global Centre for Public Service Excellence, national development planning is concerned with making anticipatory decisions regarding the future evolution of a country (GCPSE, 2014). Because of this, socio-economic development also relies on activities such as planning, risk management and strategy, which are all closely tied to the idea of the future (Godet, 2006).

We have mentioned prospects twice in this introduction. Prospects take historical and present trends and project them into the future with a business-as-usual perspective. They (prospects) are helpful to know what would happen if the LAC society decided to treat the crisis with inertia. Nevertheless, focusing on this perspective is de-empowering and removes agency in building better futures since prospects present futures as given (Dreborg, 1996).

At a particularly uncertain time in history, with heightened stakes and pressing urges in the realms of socio-economic development and resilience to climate change, what is required to achieve sustainable futures (regenerative, inclusive, positive with nature and resilient to climate change) for Latin America and the Caribbean?

Going beyond prospective into imagining futures that are alternative yet feasible, moving from a present-future thought order to a future-present one, using backcasting to envision scenarios and identify pathways and tools, provides a fresh perspective for tackling these present issues, bringing what was previously unmanageable within the scope of the manageable (Neuvonen & Ache, 2017). Additionally, by increasing awareness of alternative future(s) and converting these alternatives into strategic opportunities, we can identify key actions and mechanisms both at the individual level and at stakeholder group cooperation levels (Neuvonen & Ache, 2017).

Although the COVID-19 emergency has required immediate effective control and investment in the realms of public health, a long-term perspective of the situation is also necessary to overcome its adverse economic outcomes and to prevent further degradation of the natural environment and the materialisation of climate-change-related risks. The already insufficient development of the region and the latent threat of a climate crisis have both been put on an even more uncertain path with the hit of the COVID-19 pandemic and the resulting economic crisis.

This is the opportunity to bring the left behind issues (and people) to the top of the agenda, vindicating human rights. Moreover, this constitutes once-in-a-lifetime reflection moment on the prospects for long-term development for Latin America, presenting an opportunity to stimulate the imagination and interest of decision-makers (Sagasti, 1989).

In this regard, beyond recovery (which can imply returning to a previous state), our project emphasises an approach of regeneration, which is 'the act of improving a place or system, especially by making it more active or successful', according to Cambridge dictionary. To achieve this, we must overcome the challenge of aligning multiple and geographically dispersed efforts towards those common global goals (Gonzalez-Perez, 2015; Gonzalez-Perez, 2016; Gurdgiev et al., 2016; Kaartemo & Gonzalez-Perez, 2020). Additionally, even after succeeding in this alignment, we must still learn how to attain a proper balance of trade-offs between economic and socio-environmental goals while achieving the valuable synergies of togetherness (Wong & Van der Heijden, 2019). Planning is

and should be the 'mobilisation of hope' (Hillier & Healey 2008 as cited in Neuvonen & Ache, 2017). This paper is one of the resulting products of a project funded by the Center for the Sustainable Development Goals (CODS) to envision sustainable futures for the LAC countries in the post-COVID19 context. The study was conducted simultaneously in Bolivia, Brazil, Chile, Colombia, Jamaica, Mexico, and Peru. We collected empirical data through workshops (focus groups) with representatives from business, government, academia, and civil society in late 2020 and early 2021. For this study, we used different futures studies methodologies during the first year of the COVID-19 pandemic. In this paper, along with presenting the alternative futures identified, we bring forward the action opportunities for the different stakeholders to become an active part in achieving desired futures.

The following section presents a literature review of studies using or referring to futures methodologies to formulate national and regional level sustainable development strategies. This review was used to identify gaps and to contribute to the futures' body of knowledge. Finally, we continue with a section describing the methodology used for the project and presenting the scenarios built in the workshops and the action opportunities governments, private enterprises, academia, and the civil society can take to contribute to a regenerative and inclusive future for the region, including sub-national, national and regional cooperation opportunities.

2. Literature review: futures studies and the construction of sustainable futures at national and regional levels

In the last decades, few phenomena have shaped the way futures are discussed more than the challenges associated with climate change (Neuvonen et al., 2014). Climate models that predict global warming from 3º to 4º by the year 2100 have shown the need for policies that allow the mitigation and adaptation of extreme risks in the long term (Gowdy, 2020). Under this context, by March 2020, the world had realised the undeniable potential impact of the COVID-19 pandemic on already existing global challenges at the social, economic, political (Gonzalez-Perez, 2022b), and environmental levels.

Futurology or futures studies has been consolidated since its inception in the 1930s as an interdisciplinary field that explores the opportunities and challenges of the future to design effective strategies to face them (Caiquo & Adesida, 1994). In this line, a wide variety of future-oriented approaches has been the basis to structure long-term thinking of many nations in the world in the last 40 years (the European Union, Japan, Singapore, Korea, Taiwan, Hong Kong, United Arab Emirates, Mauritius, New Zealand, Canada, among many others) (Heydinger & Zentner, 1983; Gillwald & Habich, 1991; Van Steenbergen, 1992; Laszlo, 1992; Caiquo & Adesida, 1994; Yoo, 2008; Habegger, 2010; Kuosa, 2011; GCPSE, 2014; Ahmad, 1997; Vittal, 2004; Cameron & Potvin, 2016; Frame, 2018). Consequently, COVID-19 has represented a new call for most countries, sectors, companies, and individuals to consider future studies and re-imagine and re-invent the future (Gonzalez-Perez, 2022b).

The post-war Western Europe territorial planning methodologies, which were generated within the European Recovery Program by the Marshall Plan, have had greatly influenced on the development of futures research and on the long-term vision of the continent (Vargas-Lama & Osorio-Vera, 2020). As a result of this, most futures bibliographies incline to emphasise European and US sources, since historically those regions have tended to dominate the field (Dahle, 1993). In any case, "what has taken place in Latin America only reflects patterns established in the United States and Europe with regard to future studies and foresight" (Vargas-Lama & Osorio-Vera, 2020).

As shown in Table 1, for more than 15 years, important national planning projects based on long-term future thinking have taken place in Latin American and Caribbean countries (Martin, 2005). However, the region lacks a long-term vision (Mattar & Perrotti, 2014a; Mattar & Perrotti, 2014b; Bitar, 2014; Burinskiene & Rudzkiene, 2009; Mojica, 2010). In this sense, the role of future studies can become a driving force for strategic foresight based on the local contextualisation of global trends (Mojica, 2010).

On the other hand, futures methodologies had been used not always to predict but to show the open alternatives when dealing with several possible futures (Bertram, 1968; Kumpu, 2013; Scherhaufer, 2021). While forecasting methods are based on an extrapolation of the past that proposes probable futures according to dominant trends, backcasting methods projects desirable futures to determine the conditions that can materialize them from the present (Gonzalez-Perez, 2022b).

Conventional forecasting approaches have been criticised for their limitation of anticipating trend discontinuities, which is why they only work well when "non-economic" parameters remain constant (Caiquo & Adesida, 1994). This limitation has prompted the emergence of novel future study methods to promote strategic decisions in turbulent contexts (idem). In response to the intensification

Table 1
Some planning projects based on long-term future thinking in Latin American and Caribbean countries.

Country	Project	Reference
Brazil	São Paulo in the year 2000	(Maksoud, 1969).
Colombia	Status and foresight of the possibilities for mitigating the impact of climate change in the Atlantic Coast region	(Guerrero et al., 2014)
Costa Rica	Costa Rica's national strategy for sustainable development: A summary	(Quesada-Mateo & Solís-Rivera, 1990)
Mexico	Key areas for economic and social development: A vision from the international foresight activity	(Silvera & Silvera, 2008)
Mexico	The foresight of agriculture in the development of Mexico.	(Haro, 2013)
Peru	General Directive of the Strategic Planning Process	(CEPLAN, 2014a)
Peru	Megatrends: An analysis of the global state	(CEPLAN, 2014b)
Uruguay	Uruguay and its development foresight. Opportunities and restrictions	(Caetano & De Armas, 2015)

Source: Own construction base on Caetano & De Armas, 2015; CEPLAN, 2014a; CEPLAN, 2014b; Guerrero et al., 2014; Haro, 2013; Quesada-Mateo & Solís-Rivera, 1990; Maksoud, 1969; Silvera& Silvera, 2008; Vargas-Lama & Osorio-Vera, 2020

of landscapes with high uncertainty, scenario-based planning has been one of the future-oriented approaches that have historically evolved to guide decision-making to face alternative futures (Raford, 2015). In this sense, the exploration of alternative scenarios is one of the few possibilities available to plan sustainable futures for Latin America and the Caribbean countries, considering the significant vulnerability of the region to the current and future impacts of COVID-19 and climate change (Vargas et al., 2022).

In contrast to foresight analyses, or quantitative trend analyses, scenario planning aims

to broaden the set of variables that are considered and contrast them with a wide variety of possible outcomes (Dahle, 1992; Raford, 2015). Since the 1970s, the variables considered by futures sciences have included environmental aspects, mainly due to the influence of the publication of the Club of Rome "The limits of Growth" and to the global environmental problems that were highlighted at the Stockholm Earth Summit in June 1972 (Gonzalez-Perez, 2022). From then on, future thinking has been crucially linked to the concepts of sustainable development and sustainability (Ahmad, 1992; Dreborg, 1996; Hughes & Johnston, 2005; Tonn, 2007a; Tonn, 2007b; Alcamo & Henrichs, 2008; Julien et al., 2018). In effect, since the term "sustainable development" was first defined in the report Our Common Future, its emphasis has been firmly on the future (WCED, 1987; Cameron & Potvin, 2016).

Even though historically, most of the futures research has been directed to public-policy makers or State level economic or political decision-makers, there are still significant gaps between future studies and the policymaking related to sustainable development at the national (Abrams, 1971; Alonso-Concheiro, 1990; Schmertzing, 2021) and international level (Gallopin, 2001; Nordlund, 2008; Mattar & Cuervo, 2016). This concern is deepened in Latin America and the Caribbean countries, characterised by significant contrast between their sustainable development challenges and the low institutional response capacity (Universidad EAFIT et al., 2021). This illuminates the relevance of a greater inclusion of the futures studies in curricular programs and educational models (Julien et al., 2018), which could strengthen the role of academia in generating recommendations to achieve sustainable futures at the regional level, from the local contextualization of global challenges (Mojica, 2010; Vargas-Lama & Osorio-Vera, 2020). In fact, futures studies, there is a general call for future thinking exercises to be more collaborative and inclusive (Van der Voorn et al., 2012; Schmertzing, 2021; Neuvonen et al., 2014).

In this way, the primary purpose of this manuscript is to contribute to the knowledge gaps identified in this literature review with emphasis on (i) the construction of future scenarios taking into account the inflexion point derived from the potential impacts of COVID-19 and climate change related risks in the region, (ii) the connection between futures research and the generation of public policy recommendations for the countries of Latin America and the Caribbean and, (iii) a multi-stakeholders scenarios approach based on the participation of a representative sample of experts from the government, the private sector, the civil society and the academia.

3. Methodology

3.1. Study design

This in-depth qualitative futures study endeavoured to identify how Latin American and Caribbean countries can build long-term resilience, focusing on adaptiveness to climate change risks considering existing sustainable development challenges and the detrimental effects of the COVID-19 pandemic on the economic, environmental, and social aspects. Besides, we aim to define recommendations for achieving this and alert alternative and no desirable futures for the region.

We followed Iversen (2006) recommendations and Fauré et al. (2017) to develop future-oriented scenarios as a helpful methodology for policymaking from a sustainability perspective. Based on the literature review, we designed a generic data collection instrument (focus group protocol) based on futures methodologies and adapting Shells' seven questions futures technique (Waverley Consultants, 2017). In addition, a senior researcher and research assistants were invited in each of the seven countries to replicate in their local language the data collection and recruit and invite research participants following the established sampling protocol.

3.2. Sampling

This study relies on representative sampling. This sample type allows data from a sample to reach conclusions representing the sample's population (D'Excelle, 2014). However, using this type of sampling implies that researchers must ensure that the sample is

Table 2
Research participants by country, type of actor and gender.

Type of actor	Number of participants per country										
	Bolivia	Brazil	Chile	Colombia	Jamaica	Mexico	Peru	Total	Median	Average	Percentage (%)
Business	18	15	20	17	10	13	14	107	15	15,29	40
Academia	8	7	6	9	6	9	5	50	7	7,14	19
Government	6	5	9	8	14	9	6	57	8	8,14	21
Civil society	8	6	8	9	8	9	7	55	8	7,86	20
Total	**40**	**33**	**43**	**43**	**38**	**40**	**32**	**269**	**40**	**38,43**	**100**
Median per type of actor	**8**	**6,5**	**8,5**	**9**	**9**	**9**	**6,5**				
Women	22	16	21	25	17	17	18	136	18	19,43	51
Men	18	17	22	18	21	23	14	133	18	19	49
Total	40	33	43	43	38	40	32	269	40	38,43	100

Source: Authors

genuinely representative of the investigated population (business leaders, government officials, academics, and civil society activists). Therefore, besides ensuring harmonious multi-stakeholder participation in each workshop, additional sampling considerations were gender balance (40%-60% female per workshop); experience (40%-60% of participants in each workshop should have at least ten years of experience in the population they represent); and location (maximum of 70% of each workshop participant should share geographical location at the subnational level). A total of 269 individuals representing the four actors participated in 28 country-based focus groups (workshops). Table 2 below summarises the sample of participants in this study.

3.3. Data collection

Each national team conducted four multi-stakeholders focus groups on their local language for each country between November 2020 until February 2021. Each focus group lasted 120 minutes on average. As we collected primary data during the COVID-19 lockdown, face-to-face interactions were mediated by technology. Therefore, we used either Zoom or MS Teams for communication; and rely on Miro as mind mapping software for collective interaction.

We videotaped, and audio recorded each workshop, and permission to record the sessions was requested from participants when invited to participate. Furthermore, we requested a consent agreement to participate in the study and an authorisation form for recording their interventions.

Besides, during each session, members of the national research teams took notes of qualitative and quantitative data, relevant quotations, interactions, and emerging codes for subsequent analysis. We stored audio, and video recording of each session in each country and the transcripts to the original language in a cloud shared folder centralised by the leading research team.

The data collection instrument consisted of 7 stages. The first stage aimed to make participants familiar with the software. For this, we asked participants to brainstorm the best and worst scenarios for their own countries for 2021. Second, we invited participants to comment, validate, complement, and refute a set of pre-defined PESTEL drivers. In the 28 country-based focus groups' framework, we identified 334 drivers of change: 71 economic, 60 environmental, 59 political, 59 social, 54 technological and 41 legal. Third, we provide a 2×2 scenarios matrix in which the x-axis was (best, worst) socio-economic prosperity, and the y-axis was (best, worst) resilience to climate change. Fourth, we requested each participant to create narratives describing each of the future scenarios for 2030. Fifth, we invite participants to socialise their narrative, summarise each of them with a title and vote on which title represents each potential future. Then, we gave participants a timeline from 2020 to 2030 with 2025 as a milestone to brainstorm on critical actions to materialise each future. Finally, we provided a new 2×2 scenarios matrix in which the x-axis was (best, worst) socio-economic prosperity. The y-axis was (best, worst) resilience to climate change and invited participants to provide recommendations to existing policies propose new ones (see Fig. 1 below). In all stages of the focus groups, participants were asked to interact with other participants and express their opinions orally and in writing. Prompted by the workshop mediator, all participants contributed to the discussion.

3.4. Data analysis

Each national team was responsible for analysing each multi-actor focus group and providing an assessment at the national level.

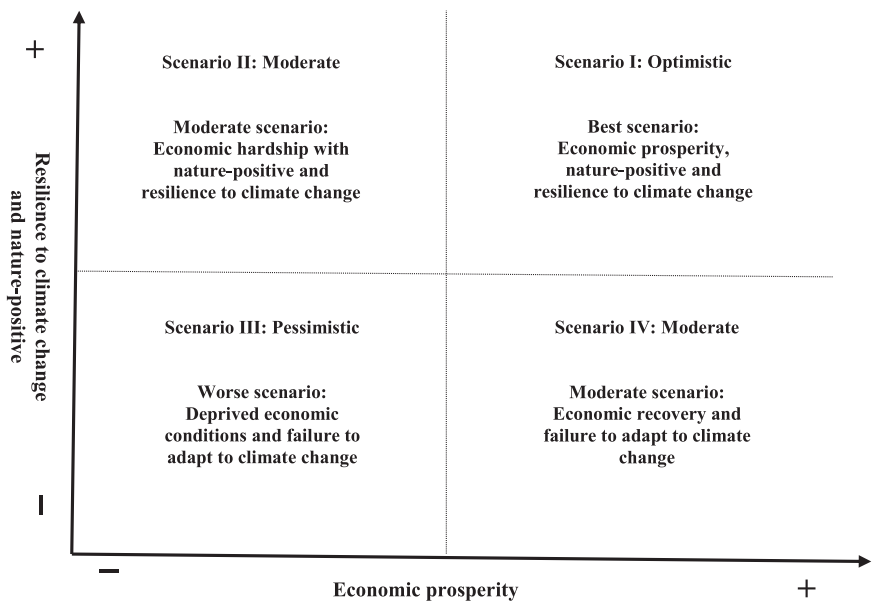

Fig. 1. Back-casting scenarios for Latin American and Caribbean countries.

Table 3
Backcasting scenarios for Latin American and Caribbean countries.

Scenario	Public Administration characteristics	Private sector characteristics	Relation with the natural environment	Society's mindset, lifestyles and conditions
Scenario I: Best scenario: socio economic-prosperity and resilience to climate change	Effective regulation and incentives protecting people and nature and promoting sustainable and regenerative activities. State efficiency, decentralization, bottom-up approach to policy making. Decision and policymaking based on science.	Proliferation of new business models. Green businesses, circular economy, regenerative agriculture, promotion of clean production and consumption. Purpose driven companies committed to corporate citizenship, contributing to the development of their stakeholders and to limiting their negative impacts.	Society understands the synergy between caring for the planet and their own welfare	Awakening of climate consciousness. A sense of the collective and of cooperation. Development is inclusive and equitable among all beings. Equal access to education and technology allows the growth in green jobs and green investment. Conscious consumption habits. Active participation in the creation, promotion and monitoring of commitments required to advance towards sustainable development at the local, national and regional levels.
Scenario II: Moderate Scenario: Socio-economic hardship with resilience to climate change	Incentives to prioritize environmental, social and governance factors in private companies. Strong, unrealistic regulations narrow the behaviour of companies and people. Renewable energy is prioritised.	Most companies are government -owned. The ones left to privates prioritize environmental, social and governance factors for strategy. These factors do not generate profit in the short term. Lack of liquidity weakens companies' ability to provide goods and services and to innovate.	Nature centered. Limited economic development. Prioritisation of climate change over the economy. Good intentions fail to materialise or be executed appropriately, and economic and social stability is sacrificed.	Since the economy is stagnant and companies are not strong enough to provide competitive goods and services, people take a "do it yourself' approach to food, energy, and clothing. Consumption habits migrate towards simplification and minimalism.
Scenario III: Worse scenario: Deprived socio-economic conditions and no resilience to climate change	Populism, power concentration and corruption. Political instability and extreme polarisation.	Increased dependence on the extraction of natural resources, especially fossil fuels and minerals. Focusing on raw materials which lack of added value compromise competitiveness and difficult socioeconomic recovery and the capacity of meeting fiscal targets.	Poor decisions harm both economic development and nature. The progressive materialisation of the effects of climate change intensify poverty, hunger and the displacement of populations	Development continues to be centralized in capital cities. The oversight of the countryside leaves agriculture and forest areas to be operated without considering any international standard for resource exploitation. High rates of unemployment. Extreme poverty and lower life quality. The population depends on relief funds. Increase in illicit economic activities.
Scenario IV: Moderate scenario: Socioeconomic recovery and lack resilience to climate change	Control mechanisms are extinguished in favour of the expansion of agricultural frontier in protected areas. Development policies have an economic and competitive focus, without prioritising environmental issues. Uncontested and corrupt political postures that neglect climate change and rule in favour of profitable but polluting sectors. Increased vulnerability to future crises.	Economic investment is conducted without sustainability criteria. Businesses are solely profit-driven. This scenario follows some of developmental trends by 2021 in the region: economic dependence on polluting sectors and the use of fossil fuels.	Anthropocentrism. Economic development is favoured at the expense of nature.	General lack of awareness of the importance of climate change and biodiversity. Increased public health issues. This scenario is characterized by inertia. The development model's long-term sustainability is not questioned. Divergence between economic and environmental goals. Short-termism.

Own construction based on the findings of project partners Casnici et al., 2022; Cordova et al., 2022; Coronado et al., 2022; Gomez-Valencia et al., 2022; Minto-Coy et al., 2022; Monje-Cueto et al., 2022; Nava-Aguirre et al., 2022

Table 4
Opportunities for SDGs-based action, policies groups and implementation considerations.

Public policy group	Opportunities for action	SDGs
Renovation of the Welfare State (Universal system of social protection)	• Investment in infrastructure, education and health and in the human resources needed for implementation to improve access to those services • Universal access to energy, Internet, water and sanitation • Unemployment Program • Social programmes for those in vulnerable situations for them to achieve economic independence	SDG 1.3 SDG 1.5 SDG 3.8 SDG 8. b
Education for sustainability	• Citizenship consciousness toward conservation • Achieve universal access to education and ITCs • Developing infrastructure and technology for internet coverage • Including environmental and climate education in the curriculum • Improve the quality and efficiency of teaching and learning • Educating for sustainable consumption • Educating for diversity with inclusion • Educating for creativity and innovation • Constant and updated qualification of the workforce	SDG 4 SDG 13.3 SDG 8. b SDG 9. c
Rural development and food security	• Acceleration of the rural economy and rural integration • Sustainable agriculture practices, agroecology, silvopastoralism and regenerative agriculture for healthy production and biodiversity • Standards for organic farming • Local consumption • Agriculture productivity and storage • Value-added agricultural products with export potential • Diet diversification	SDG 1.4 SDG 8 SDG 12 SDG 15
Sustainable use of natural resources	• Sustainable land use • Nature-based solutions • Sustainable use of oceans	SDG 8.4 SDG 14 SDG 15
Energy transition	• Green mobility (mass and private) and merchandise transportation • R+D for technology and process innovation • Carbon neutrality • Clean technology	SDG 9 SDG 13
Economic resilience and regenerative diversification	• Sustainable withdrawal of extractive industry • Creative economy • Bioeconomy • Sustainable tourism • Green jobs generation • Purpose-driven business • Sustainable exports • Water, energy and resource efficiency • Formalisation • Sustainable supply chains • Sustainable business models • Circular economy • Consumers sustainable awareness • Sustainable lifestyle adoption • Align private ventures to the national climate strategy • Process innovation and R&D • Multi-stakeholder agreement on R&D priorities to promote national development • Strong intellectual property protection • Sustainable government procurement • Payments for ecosystem services • Resilient cities • Sustainable infrastructure • Carbon markets • Profitable climate action • Green bonds	SDG 8.2 SDG 8.3 SDG 8.4 SDG 8.9 SDG 9.3 SDG 9.5 SDG 9. b SDG 9. c SDG 11 SDG 13

Source: Own construction based on the findings of project partners Casnici et al., 2022; Cordova et al., 2022; Coronado et al., 2022; Gomez-Valencia et al., 2022; Minto-Coy et al.,2022; Monje-Cueto et al., 2022; Nava-Aguirre et al., 2022

Also, each national team should provide both data and analysis according to the categories previously identified. Besides, each national team provided emerging categories, rankings, and alternative clustering, which were not considered in the initial research design.

All activities were conducted in the native language of each country, recorded and further translated to English. We coded the transcripts using Atlas.ti. In addition, we used an MS Excel spreadsheet to code all written data collected used during the futures focus groups. The list of codes used by the researchers was prepared a priori of the coding process and comprised 16 code groups and 309 codes. Codes ranged from actors, drivers of change, structural changes, limitations and risks to goals and opportunities for action, among other relevant aspects of the research topic. National coding added up to 413 codes classified into code groups and analysed by the research team in each country.

4. Findings

The results from the futures' methodology workshops implemented in the seven different countries show common ground regarding some of the most pressing needs and opportunities for action. This is coherent with the workshop participants' perception regarding the interconnectedness of the region's issues. It is also consistent with the benefits and urgency for cooperation between different actors within national, regional, and global spheres to address these issues.

4.1. Four scenarios for Latin American and Caribbean countries

The four scenarios of socioeconomic recovery and climate change resilience for the region are presented in Table 3. These scenarios result from a comparative and overlapping analysis of the scenario narratives proposed by the research partners from the seven countries participating this study. The axes of the diagram are the apparently contradicting goals of (1) achieving socio-economic recovery and (2) achieving resilience to climate change while avoiding biodiversity loss. More detailed narratives for each scenario can be found in each country chapter of the project book (Gonzalez-Perez, 2022). This paper provides an overview of the characteristics of the four resulting scenarios: an optimistic, a pessimistic, and two moderate scenarios. Finally, the key opportunities for action which are common across countries are identified.

4.2. Action priorities

Although each country research team participating in this study brought forward different action opportunities identified in the workshops, the comparative analysis evidence convergence around 50 action priorities identified across the LAC countries, which were compiled in six public policy groups. Table 4

Table 5
Regulatory policies, incentives, and disincentives.

Regulatory Policies
Mandatory regulation around climate actions for companies, public entities and individuals
Regulation of the use of land and natural resources
Regulation for the protection of biodiversity
Regulation of the extractive industry
Regulation of green bonds
Regulation of the carbon market
Norms for the renovation of soils
Designing and implementing sanctions to polluting emissions
Strengthening control on protected areas already established
Regulatory framework to support the inclusion of local economy into the national development
Regulatory framework to support investment in strategical sectors for business and social recovery
Enforce regulation for responsible mining
Incentives
Incentives for sustainable practices in business
Financing for SMEs that are committed to sustainability
Incentives for business, public entities and individuals for protecting biodiversity
Incentives for the inclusion of climate change resilience strategies in key sectors
Incentives for the application of environmentally sustainable technologies for small and medium enterprises
Incentives to promote the use of technology for innovation
Disincentives
Tax burden of polluting and carbon-intensive economic activities
Tax incentives to promote responsible production and consumption
Tax incentives for investment in strategic sectors for transformative recovery
Reduce the tax burden of companies with positive economic impacts
Tax incentives focused on low-carbon sectors
Reduction of taxes in households that apply environmental techniques
Taxation of large fortunes
Sanctions to polluting accidents and negligence

Source: Own construction based on the findings of project partners Casnici et al., 2022; Cordova et al., 2022; Coronado et al., 2022; Gomez-Valencia et al., 2022; Minto-Coy et al., 2022; Monje-Cueto et al., 2022; Nava-Aguirre et al., 2022

4.3. Public policy instruments

The opportunities for action can be implemented through public policies. Public policies proposed by workshop participants can be categorized into regulatory policies, incentives, and disincentives. Table 5 summarizes policy examples in each category.

The policies proposed by the participants which were directed towards modifying people's behaviour and drawing the limits of what is acceptable and not, were classified within the category of *regulatory policies*. Workshop participants highlighted the urgency of establishing regulation around climate change, migrating from voluntary recommendations towards mandatory requirements for public entities, companies, and individuals (Gomez-Valencia et al., 2022).

Keeping in consideration the high level of environmental degradation in the region, the need to strengthen existing laws and monitoring mechanisms to enforce them becomes urgent (Coronado et al., 2022). However, workshop participants show a pro-business and realistic perspective, acknowledging that although regulating the use of natural resources is key, this should not mean the impossibility to exploit them for wealth. Since the regional economy depends greatly on agriculture, mining and living stock, different technologies and agreements that allow the exploitation of natural resources without compromising the economy must be considered. The carbon market regulation is a good example of this kind of mechanism (Casnici et al., 2022).

In the same line, participants from the private sector highlighted the relevance of strengthening *incentives* fostering both proper economic recovery and adequate mitigation and adaptation strategies for climate change and biodiversity loss. These could prompt fair commercial and production operations together with a sustainable perspective (Cordova et al., 2022). In some cases, in which prohibition is not feasible, *disincentives* and sanctions can also aim to deter climate disasters. This is the case for fossil fuels and plastic consumption.

Additionally, according to the participants, the LAC countries should conduct a tax reform allowing both national and local governments to finance their public policies without depending on international funding. Furthermore, academia, civil society and the public sector should work together to influence the reform with evidence that through the correct green incentives, socioeconomic growth can be promoted, and the environment can be protected (Casnici et al., 2022).

4.4. Multi-actor approach: how can non-government actors take part on regenerative recovery for the region?

The interconnected nature of the region's challenges in regard to development and environmental regeneration was stressed by workshop participants. They insisted these challenges benefit greatly from cooperation within and between all actors (public sector, private sector, civil society, and academia) and at all levels (local, national, regional and international). Since these issues should not be left to the public sector only, workshop participants provided opportunities for the other actors to take part too. Table 6 summarizes the means of implementation for each actor. Public sector means of implementation have been expressed in the previous section.

5. Concluding remarks and contribution to the field of future studies

In this paper, we assess alternative futures for Latin America and the Caribbean in the post-COVID19 context using participatory futures methodologies workshops, with experts from the different stakeholder groups. There are infinite alternative futures possible. Focusing on prospecting historical and present trends into the future may yield limited perspectives and does not empower change. Countries, companies, academics, and civil society "should seize the opportunity to work actively to achieve a desirable future or risk an undesirable future being forced on them as destiny" (Caiquo & Adesida, 1994 p.897). Social, political, economic, technological, and environmental factors should not be taken as given or fixed. Instead, although they constitute drivers, they should also be considered

Table 6
Means of implementation for the private sector, civil society and academia.

Means of implementation for private sector	Means of implementation for civil society	Means of implementation for the academia
Redefinition of firm's purpose	Active civic engagement/Mobilisations to promote a green, fair and inclusive recovery	Boost of cultural change towards green and inclusive economic recovery
Corporate citizenship and business activism around sustainability	Youth leadership empowerment	Civic engagement/Promotion of collective action
Prioritisation of sustainability criteria in financial sector decisions	Conservation and transmission of knowledge about the territory	Leading the transformation of the educational system
Strengthen relationships among local stakeholders and networks	Appropriation of local mechanisms for disaster risk management	Generation of scientific bases for the design and implementation of public policies
Adoption of an economy based on regeneration	Strengthening the community economy	Coordination of public-private alliances
Adoption of a climate change risks and opportunities approach (TFCD)	New sustainable consumption habits/modest lifestyles and climate sensitivity	Research and development for greener the energy mix, heating and cooling technology
Responsible investment	Vigilance to behaviour and commitments of the government and the private sector.	Re-assessing protected areas with the academia to restore and protect strategic ecosystems
Increasing the power of companies to return to society in the form of ESG with impact measurement		Systematisation and dissemination of success cases
Generation of decent work		
Green foreign direct investment		

Source: Own construction based on the findings of project partners Casnici et al., 2022; Cordova et al., 2022; Coronado et al., 2022; Gomez-Valencia et al., 2022; Minto-Coy et al., 2022; Monje-Cueto et al., 2022; Nava-Aguirre et al., 2022

key factors to be influenced in the right direction (Caiquo & Adesida, 1994 p.897).

Having climate change resilience in one axis and socio-economic recovery in the other, we created four scenarios. Research participants created the narratives of these scenarios and identified characteristics and drivers. Derived from these, we present over 50 action opportunities for public policy, and action opportunities for the private sector, the academia and civil society to achieved desired futures.

In achieving the best possible scenario, a virtuous cycle is generated. Better policy establishing a welfare State with safety nets for the most vulnerable and human rights for all allows for improved equality in accessing services and opportunities that enable people to overcome poverty and develop the capabilities to participate and build better and future-proof businesses committed to sustainable development. Moreover, innovative production and consumption models seek resource efficiency and are conscious of the natural environment.

In this paper general actions applicable through the countries in the region are presented. Tackling these challenges requires and benefits greatly from the cooperation between the actors at the national and international levels. Still, we acknowledge a gap regarding the differences and particularities in desired outcomes and contexts between the LAC countries and even within them at subnational levels. These particularities suggest that a one-size-fits-all approach may not be entirely practical, although Participative, representative bottom-up approaches and specific solutions are also going to be needed. We invite scholars, governments, private organisations and civil society organizations to engage in the creation of those subnational scenarios, to fill the pieces in the puzzle of the strategy for sustainable and regenerative futures for Latin America and the Caribbean, and the cooperation opportunities for socio-economic development in the region

Acknowledgements

This paper summarises the main findings of a study on climate action funded by the Center of the Sustainable Goals (CODS) at Universidad de Los Andes (Colombia). The authors of this paper gratefully acknowledge the participation of the 269 people who participated in the 28 future scenario building workshops in Bolivia, Brazil, Chile, Colombia, Jamaica, Mexico and Peru. We also acknowledge the support of the research assistants.: Itzel Zárate Solis, José Luis Rojas Vázquez, Bruce Lezana, Javiera García, Yanniré Cid, Larissa Marchiori, Ana Julia Santiago, Pablo Leão, Fátima Huamán, Ruth Powosino, Thais Liñan, Johnny Davy Ruiz Ayala, Aaron Hoilett, Tameka Claudius and Latoya Lambert.

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