# COMMENT OPEN (Check for updates) The ABCs of governmental climate action challenges in Latin America

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Following Tosun's distinction between international, national, and subnational scales of intervention, this commentary presents the ABCs of governmental climate action challenges in Latin America. In relation to international climate action, Latin American organizations present numerous and diverse positions in international fora. This heterogeneity of positions affects the region's bargaining power. At the national level, centralism, dominant, hierarchical political cultures, and weak federal systems have limited collaboration across government sectors and offices as well as citizen participation. Furthermore, localized climate action is constrained by political centralization together with administrative, technical, and financial limitations of local and regional governments. Altogether these elements represent the ABCs of challenges for climate action in Latin America. This perspective piece remarks a gap in the literature, highlighting the ways that publications regularly ignore a comparative and regional outlook. Accordingly, this text recommends that Latin American social researchers move beyond single case studies to carry out crossnational comparisons.

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# INTRODUCTION

Climate action in Latin America has attracted the attention of global institutions like the Inter-American Development Bank (IDB), the United Nations Development Program (UNDP), and the World Bank, among others<sup>1–3</sup>. Following the evolution of climate governance and policy in the region, the most recent developments include traditional actions linked to mitigation and adaptation as well as participation from different levels of governmental organizations (NGOs) and businesses. While there is still a long way to go, Latin America has responded to climate change and its related challenges in progressive ways.

Similarly, social science research has recently begun focusing on previously neglected aspects of climate action in Latin America, including public policy design and implementation, government/ business collaboration (and collusion), and contributions from civil society organizations and the general public. However, this scholarly research fails to include systematic analyses of the challenges that the region faces in terms of policy and action. Notable exceptions include a collection of essays published by the Latin American Council of Social Sciences<sup>4</sup> as well as a book that sheds light on the gulf between global climate negotiations and the environmental realities of the region<sup>5</sup>. Nevertheless, our literature review demonstrates significant research gaps, including the lack of comparative analyses and works that take a regional perspective.

This perspective piece reviews the primary research literature on climate action in Latin America, summarizing the most relevant findings and tracing new lines of inquiry. Although the broader climate action terrain includes different types of actors (public, private, and social), the scope of this analysis is limited to governmental action. This text is organized according to Tosun's<sup>6</sup> distinctions between international, national, and subnational scales of intervention, which is useful for delineating the main challenges concerning governmental climate action in the region. Although Latin America is not a monolithic entity when it comes to climate change, general trends do exist due to shared characteristics among countries. At an economic level, climate change is linked to regional development models that have been historically characterized by a reliance on natural resource extraction<sup>7</sup>. At a social level, the centrality of extractivist operations as a lever for development has resulted in high levels of conflicts across the region<sup>8–10</sup>. In 2022 Latin America was the region with the highest rate of mortalities among environmental, land, and indigenous rights defenders<sup>11</sup>. Thus, although Latin America is characterized by a diversity of political regimes, they all share the feature of having major obstacles to civil society participation in climate policy decision-making<sup>12</sup>.

Our methodology consisted of identifying journal articles and book chapters published in Spanish and English. This was carried out through Google Scholar searches employing the keywords "Latin America," "climate action," and "climate policies" in both languages. The literature was then narrowed down using the criteria of relevance (number of citations) and focus (only social science climate research was included). The snowball method was subsequently employed to identify additional material using the references in the initial literature. The same selection criteria were applied in this step. Finally, the list was complemented with works that were identified through a Google Scholar search that used keywords related to different scales (international, national, and local) of intervention (e.g., "Bolivarian Alliance for the Peoples of our America" for the international arena). Here, papers were selected based on their linkage to climate action.

# CLIMATE ACTION AT THE INTERNATIONAL LEVEL

Latin America is a diverse and economically unequal region, made up of countries with distinctive economic and demographic profiles<sup>13</sup>. The economies of Argentina, Bolivia, Brazil, Colombia, Ecuador, Mexico, and Venezuela are highly dependent on oil and

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gas revenues<sup>14</sup>, while those of Central American countries rely on agriculture, forestry, and other land uses<sup>2</sup>.

Latin America produces approximately 7% of global greenhouse gas (GHG) emissions<sup>3</sup>, yet it is one of the most vulnerable regions to the impacts of climate change, particularly as experienced by its poorest populations<sup>15</sup>. The following figures summarize climaterelated inequality: Brazil and Mexico are responsible for almost half of GHG emissions produced in Latin America, 33% and 16%, respectively<sup>14</sup>, but the countries that are most vulnerable to climate change are in Central America and the Caribbean<sup>2</sup>. Accordingly, climate change mitigation literature concerning Latin America considers land conservation<sup>16</sup> and energy transition<sup>17</sup> to be key necessary activities. However, these structural challenges to climate action in the region and the ways to be transformed must be further researched.

Latin American organizations present numerous and diverse positions in international fora. In the United Nations Framework Convention on Climate Change (UNFCCC), climate action is carried out by negotiating groups comprised of countries from the region. Here, Caribbean countries have joined the Alliance of Small Island States (AOSIS) to call for drastic GHG reductions<sup>5</sup>, whereas Brazil, South Africa, India, and China have formed the BASIC group to represent the interests of emerging economies and advocate for climate policy compromises<sup>18</sup>. Another bloc of countries that includes Mexico, Chile, Colombia, Costa Rica, and Peru has also emerged and is characterized by the promotion of climate ambitions that are linked to domestic measures<sup>5</sup>. Their proposed linkage of global positions and domestic actions provides another terrain for further investigation, particularly since the linkage brings implementation challenges at the national level.

In terms of purely regional negotiation blocs, Watts & Depledge<sup>19</sup> trace the emergence of two main groups: the Bolivarian Alliance for the Peoples of our America (ALBA), formed in 2009, and the Independent Association of Latin American and the Caribbean (AILAC), formed in 2012. Whereas the former advocates for the recognition of historical responsibilities in the agreement and resists market mechanisms, the latter takes a more collaborative approach toward the Global North<sup>19</sup>. Taking into consideration the need for financial support for climate action throughout Latin America, this heterogeneity of positions affects the region's overall bargaining power. However, further research is necessary to have a better understanding of the negotiating roles and the outputs of Latin American countries in the UNFCCC. Much of what has been written on these subjects has been more descriptive than analytical<sup>20</sup>, leaving many doubts about the effectiveness of these climate action interventions.

The different approaches taken by Latin American countries is also reflected in the heterogeneity of existing regional politicaleconomic alliances. For example, Mexico participates as a member of the North American bloc (alongside the United States and Canada), while progressive governments (mostly from South America) participate through ALBA<sup>21</sup>. Both alliances have experienced political gains and setbacks, whereas the Central American Integration System (SICA) stands as a more stable bloc, unaffected by political changes. These integration processes have been demonstrated to impact climate action and inaction in different countries<sup>22,23</sup>.

In North America, the Commission for Environmental Cooperation (CEC) presents a great institutional achievement (although it is not exclusively dedicated to climate action). The so-called "three partners," Mexico, the United States, and Canada have repeatedly jointly addressed the challenges of climate change. However, CEC operations have been constantly sidetracked due to political turmoil<sup>24</sup>. Despite this, Pacheco-Vega<sup>25,26</sup> has found that regional integration has resulted in increased denunciations on the part of civil society concerning non-binding mechanisms in U.S., Canadian, and Mexican environmental legislation. Furthermore, the renewed United States–Mexico–Canada Agreement (USMCA) has enhanced environmental protection within regional commerce<sup>27</sup>.

Conversely, ALBA organized the 2010 World People's Conference on Climate Change and the Rights of Mother Earth to demand that developed countries commit to quantifiable emission reduction goals (an acknowledgment of the Rights of Nature that extend beyond financial compensation) and the creation of an International Climate and Environmental Justice Tribunal<sup>28</sup>. Regarding the Central America bloc's Regional Strategy on Climate Change, this proposal has clashed with the developmental aspirations of some Central American countries. Lazo<sup>29</sup> thus points to the lack of climate finance as being a central obstacle to climate action. Here too, more research is needed about regional actions designed to tackle climate change.

# CLIMATE ACTION AT THE NATIONAL LEVEL

According to our sample literature, the reluctance to implement climate strategies in Latin America is related to the wellestablished conception that only developed countries are responsible for climate change<sup>30</sup>. Following this observation, several authors have argued that development can indeed be sustainable and favorably responsive to climate change<sup>31</sup>. Never-theless, scholars working on climate action in Latin America have criticized most climate-friendly initiatives, categorizing these with terms such as green grabbing, green colonialism, and green extractivism<sup>32</sup>.

Currently, recent trends towards the "reprimarization" of Latin American economies involve a more active role by the State, where the latter is more responsible for procuring economic growth and wealth distribution<sup>33</sup>. In this regard, governments in the region, upon realizing that they are unable to co-opt emerging indigenous environmental movements as a result of their distinctive ways of valuing the territory and natural resources, have accused these movements of hampering development<sup>34,35</sup>. The tension between development and progressive climate actions in Latin America<sup>36</sup> has contributed to the rise of alternative frameworks for relating to nature and the environment such as Buen Vivir —a concept associated with post-developmentalism<sup>37</sup>. These locally grounded forms of resistance have caught the attention of scholars throughout the region but have yet to be explored in terms of potential incorporations into mainstream policies.

Until recently, Latin America was not fertile ground for climate change deniers<sup>38</sup>. Climate debates instead centered on climate justice and the fair distribution of the costs associated with climate policies<sup>39</sup>. Today, regional climate debates increasingly include leaders that deny the problem of climate change and the need for action, including Jair Bolsonaro in Brazil<sup>40</sup> and, more recently, Javier Milei in Argentina. This tendency is becoming a central challenge to climate action in the region.

The Economic Commission for Latin America and the Caribbean (CEPAL) is a good starting point to get to know existing climate policies in the region (see: https://observatoriop10.cepal.org). The adoption of climate-related policies has become commonplace in Latin America, but it is the diffusion of climate acts<sup>41</sup> that has really caught scholarly attention. Mexico was the first country in the region to adopt a Climate Act in 2012, with Peru (2018), Paraguay (2017), and Chile (2022) soon following this example. Guatemala and Honduras (both in 2013) have also followed suit with the difference that their climate acts came by presidential decree.

Despite these national legislative efforts, the implementation of the entailed policies has been limited as a result of a lack of coordination across policy sectors, asymmetries in the power given to different governmental areas (e.g., environment vs. energy), and short-sighted politicians<sup>42</sup>. Once again, the implementation and non-implementation of such policies offer fertile

grounds for scholars of Latin America to develop new research agendas. Also needed is research concerning the institutionalization of government climate action in Latin America, and the effects of budget cuts on environmental ministries<sup>43</sup>.

The limited institutional capacity development poses a fundamental challenge to the implementation of national-level climate actions in Latin America. Focusing on climate adaptation in Argentina, Brazil, Chile, Costa Rica, Paraguay, and Uruguay, Ryan & Bustos<sup>44</sup> identified knowledge deficits related to the policy design, implementation, and evaluation. Considering the complexity of national-level climate action, policy integration has to be central in institutional capacity building<sup>45</sup>. Numerous countries have initiated organizational interventions to improve intersectoral coordination, a process frequently led by the national environmental authority<sup>46</sup>. Here too, the current literature presents a minimal number of investigations concerning such coordination efforts in Latin America<sup>47,48</sup>.

The problems of centralism, hierarchical political cultures, and weak federal systems have also constrained decentralized climate actions, even in countries where the government does not have a strong interest in climate change<sup>49</sup>. In the words of Sapiains et al., polycentric approaches "may not easily be implemented in Latin America where authoritarian, individualistic, and top-down policies and institutions have historically prevailed<sup>50</sup>. Such political cultures also opposed the demands of social movements and civil society<sup>51</sup>. As such, the participation of grassroots organizations and other political acters within the climate political process are subordinated to government interests and are prevented from shaping policies<sup>52,53</sup>. Nevertheless, more empirical evidence is needed to demonstrate the ways that these regional and political factors have hindered climate action at the national level.

Given the region's vulnerability to climate change, adaptation policies are central to climate action in Latin America<sup>54</sup>. In fact, the impacts of climate change on local livelihoods have increased climate migration, a situation that urgently calls for both policy action and social research<sup>55</sup>. Indeed, the World Bank has estimated that by 2050 approximately 3.9 million people will have migrated because of climate-related causes in Central America and Mexico, alone<sup>56</sup>.

#### CLIMATE ACTION AT THE SUBNATIONAL LEVEL

The available empirical evidence suggests that localized climate action is limited by political centralization as well as the administrative, technical, and financial restraints of local and regional governments<sup>57,58</sup>. This being the case, this section provides a topical framework for discussing the main challenges for climate action at the local level.

On the one hand, proponents of multilevel approaches contend that the State's capacity to effectively implement climate policies depends on collaboration and coordination capacities among institutions<sup>47</sup>. Accordingly, the participation of local and subnational climate action actors in climate action policymaking is hindered by administrative, technical, and financial shortfalls, particularly in the context of countries with centralized governments, which prevail in Latin America. On the other hand, proponents of polycentric approaches contend that decentralized climate action linked to transnational networks can offer the technical and financial support required for the development of climate actions<sup>59,60</sup>. This is supported by research suggesting that transnational governance initiatives can provide opportunity structures and the necessary exchange of knowledge for the development of local climate action in Latin America<sup>25,26,61</sup>. There is thus the potential for local climate action to replace the prevailing centralist climate action models.

However, researchers must collect further empirical evidence to establish the best ways to respond to the aforementioned climate action challenges. Developing these lines of inquiry could reveal the ways that polycentric and decentralized climate actions offer a viable alternative to the authoritarian, institutionalized, and topdown climate policies that have historically prevailed in Latin America. Empirical material can be collected through cases that involve transnational initiatives, like those of Local Governments for Sustainability (ICLEI) or the Cities Climate Leadership Group (C40). Similarly, more studies concerning the role of international (technical and financial) cooperation agencies as facilitators of local climate action in Latin America are also needed. Finally, further research concerning communitarian institutions and local experiences related to climate action in Latin America is also required.

#### FINAL COMMENTS

This perspective piece has presented the main challenges for governmental climate action in Latin America and offered a broad mapping of the related existing literature. Certainly, the obstacles for climate action in the region are overwhelming. These involve differing perspectives presented in international climate forums as well as national legacies of political centralization and authoritarianism. Such a terrain is adverse not only for the localization of climate action but also for the participation of different groups and publics that embody emerging possibilities for climate governance at a global level. Tosun's framework<sup>6</sup> has proved to be useful in delineating the main challenges concerning governmental climate action in Latin America, but much work remains to be done, particularly in relation to the participation of non-state actors in climate action.

This literature review has focused on climate action dynamics in Latin America, which leads to the question of whether the noted challenges are specific to this region or whether they are common to other regions in the Global South. Another open question concerns which lessons derived from the Global North can be applied to Latin America and vice-versa. To answer these questions, cross-regional studies must be developed. In the meantime, we call on social scientists to advance research that examines cross-national climate action phenomena and related local experiences in Latin America.

# DATA AVAILABILITY

This research did not rely on specific datasets.

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#### REFERENCES

- Cárdenas, M., Bonilla, J. P. & Brusa, F. Climate policies in Latin America and the Caribbean: success stories and challenges in the fight against climate change. (Inter-American Development Bank, Washington D.C, 2021). https:// publications.iadb.org/publications/english/viewer/Climate-policies-in-latinamerica-and-the-caribbean.pdf.
- Cardenas, M. & Orozco, S. The challenges of climate mitigation in Latin America and the Caribbean: Some proposals for action. UNDP Latin America and the Caribbean, Policy Documents Series. UNDP LAC PDS N°. 40. https:// www.undp.org/sites/g/files/zskgke326/files/2023-01/PNUDLAC-working-paper-40-climate-EN.pdf (2023).
- World Bank. A roadmap for climate action in Latin America and the Caribbean. https://reliefweb.int/report/world/roadmap-climate-action-latin-america-andcaribbean-2021-2025?gclid=Cj0KCQjw2qKmBhCfARlsAFy8buKYtjSuwFolkEihDs \_qNGsPUXFCG\_58m2tDActCCj9eM6TiopRxl9laAqmjEALw\_wcB (2022).
- 4. Günther, M. & Gutiérrez R. (Coords.) La política del ambiente en América Latina Una aproximación desde el cambio ambiental global. Universidad Autónoma Metropolitana. CLACSO. http://biblioteca.clacso.edu.ar/clacso/se/20170612053229/LaPoliticaDel Ambiente.pdf.

- 4
- Edwards, G., & Roberts, J. T. A Fragmented Continent: Latin America and the Global Politics of Climate Change. (The MIT Press, 2015). https://doi.org/10.7551/ mitpress/9473.001.0001.
- 6. Tosun, J. Addressing climate change through climate action. Clim Action 1, 1. https://doi.org/10.1007/s44168-022-00003-8 (2022).
- Svampa, M. Neo-extractivism in Latin America: Socio-environmental Conflicts, the Territorial Turn, and New Political Narratives (Elements in Politics and Society in Latin America). (Cambridge University Press, Cambridge, 2019). https://doi.org/ 10.1017/9781108752589.
- Estenssoro, J. Challenges of Latin America in the global environmental geopolitics of the twenty-first century. In (eds. Lorenzo, C.). *Latin America in Times of Global Environmental Change*. (Springer Nature, 2020) pp.15–29.
- Martínez-Alier, Joan. Mapping ecological distribution conflicts: The EJAtlas, The Extractive Industries and Society, Volume 8, ISSN 2214-790X (2021).
- Solorio, I., Ortega, J., Romero, R. & Guzmán, J. AMLO's populism in Mexico and the framing of the extractivist agenda: the construction of the hegemony of the people without the indigenous voices. Z. Vergl. Politikwiss. 15, 249–273 (2021).
- Front Line Defenders (2022) Global Analysis. https://www.frontlinedefenders.org/ sites/default/files/1535\_fld\_ga23\_web.pdf (2022).
- Leon, D. S. Do international rents bolster democratic backsliding under populist governments? Evidence from Latin America. Int. Area Stud. Rev. 25, 280–302 (2022).
- Reyer, C. et al. Climate change impacts in Latin America and the Caribbean and their implications for development. *Reg. Environ. Change* 17, 1601–1621 (2017).
- Franchini, M. A., & Viola, E. J. América Latina en la gobernanza del Antropoceno: desafíos y propuestas. Cuadernos Del Claeh, 11-34. https://doi.org/10.29192/ claeh.41.2.2 (2022).
- Conde, C. & Saldaña, S. Cambio climático en América Latina y el Caribe: Impactos, vulnerabilidad y adaptación. *Rev. Ambient. Desarrollo.* 23, 23–30 (2007).
- Hall, A. Getting REDD-Y Conservation and Climate Change in Latin America. Latin American Research Review, Special Issue. (Cambridge University Press, 2011). https://doi.org/10.1353/lar.2011.0039.
- Stanley, L. Latin America Global Insertion, Energy Transition, and Sustainable Development (Elements in the Economics of Emerging Markets). (Cambridge University Press, Cambridge, 2020). https://doi.org/10.1017/9781108893398.
- Hallding, K. et al. Report Preview: Together Alone: Brazil, South Africa, India, China (BASIC) and the Climate Change Conundrum. (SEI, 2011).
- Watts J. & Depledge J. Latin America in the climate change negotiations: Exploring the AILAC and ALBA coalitions. WIREs Clim Change. https://doi.org/ 10.1002/wcc.533 (2018).
- Torres Ramírez, B. El activismo en materia de cambio climático en la búsqueda del reposicionamiento internacional de México. Foro Internacional. Vol. LIII, 3–4 (213–214) julio - diciembre (2013).
- Diamint, R. Regionalismo y posicionamiento suramericano: UNASUR y ALBA / Regionalism and South American orientation: UNASUR and ALBA. *Rev. CIDOB* d'Afers Int. 101, 55–79 (2013).
- Selin, H. & VanDeveer, S. (eds.) Changing Climates in North American Politics: Institutions, Policymaking, and Multilevel Governance (The MIT Press, 2009).
- López-Vallejo, M. Reconfiguring Global Climate Governance in North America: A Transregional Approach. (Routledge, 2016).
- Fickling, M. & Schott, J. NAFTA and Climate Change. (Peterson Institute for International Economics, Washington, D.C., 2011).
- Pacheco Vega, R. Las denuncias ciudadanas sobre cumplimiento ambiental en América del Norte (1996-2012): perspectivas sobre la sociedad civil ambientalista norteamericana. Norteam. Rev. Acad. Del CISAN-UNAM https://doi.org/10.20999/ nam.2013.a005 (2013).
- Pacheco-Vega, R. Transnational environmental activism in North America. *Rev. Policy Res.* 32, 146–162, (2015).
- Ramírez, J. El tratado entre México, Estados Unidos y Canadá como instrumento complementario al Acuerdo de París en la lucha contra el cambio climático. Derecho Glob. Estudios Sobre Derecho Just. 7, 49–75 (2022).
- Solorio, I., Romero, R. & Ros, C. Indigenous and local knowledge in environmental decision making: the case of climate change. In (eds Helge Jörgens, Christoph Knill, Yves Steinebach) *Routledge Handbook of Environmental Policy*. (Routledge, 2023).
- Lazo, Miguel. Centroamérica y el cambio climático: De la planificación a la acción. Realidad y Reflexión, Año 20, N 51. (2020).
- Ryan, D. Política y cambio climático: explorando la relación entre partidos políticos y la problemática climática en América Latina. *Ambient. Soc.* 3, 277–294 (2017).
- Beg, N. et al. Linkages between climate change and sustainable development. *Clim. Policy* 2, 129–144 (2002).
- Malte, F. Green colonialism in Latin America? Towards a new research agenda for the global energy transition. *Eur. Rev. Lat. Am. Caribb. Stud.* **114**, 137–146 (2022).
- npj Climate Action (2024) 6

- Lopez, E. & Francisco Vértiz, F. Extractivism, transnational capital, and subaltern struggles in Latin America. *Lat. Am. Persp.* 42, 152–168 (2015).
- 34. Martínez-Alier, J. The environmentalism of the poor. *Geoforum* **54**, 239–241 (2014).
- Gudynas, E. Diez tesis urgentes sobre el nuevo extractivismo. In Extractivismo, Política y Sociedad, et al. 187–225. Ecuador: CAAP—CLAES. (2009).
- Kothari, A., Demaria, F. & Acosta, A. Buen Vivir, Degrowth and Ecological Swaraj: alternatives to sustainable development and the Green Economy. *Development* 57, 362–375 (2014).
- 37. Gudynas, E. Buen Vivir: today's tomorrow. Development 54, 441-447 (2011).
- Ryan, D. Diseño de la institucionalidad climática: aportes para el análisis. Ambient. Soc. XIX, n. 4 n p. 211–222 (2016).
- Stein, A. Cambio climático y conflictividad socioambiental en América Latina y el Caribe. Am. Lat. Hoy 79, 9–39 (2018).
- Mendes, F. & Hauber, G. Anti-environmentalism and proto-authoritarian populism in Brazil: Bolsonaro and the defence of global agri-business. *Environ. Polit.* 32, 642–662 (2023).
- Nash, S., Torney, D. & Matt, S. I. Climate change acts: origins, dynamics, and consequences. *Clim. Policy* 21, 1111–1119 (2021).
- 42. Ryan, D. et al. Toma de decisiones y cambio climático: acercando la ciencia y la política en América Latina y el Caribe. UNESCO. http://repositorio.minedu.gob.pe/bitstream/123456789/4751/1/Toma%20de%20decisiones%20y%20cambio% 20clim%c3%a1tico%20acercando%20la%20ciencia%20y%20la%20pol%c3% adtica%20en%20Am%c3%a9rica%20Latina%20y%20el%20Caribe.pdf (2016).
- Dussauge-Laguna, M. I. The promises and perils of populism for democratic policymaking: the case of Mexico. *Policy Sci.* 55, 777–803 (2022).
- Ryan, D. & Bustos, E. Knowledge gaps and climate adaptation policy: a comparative analysis of six Latin American countries. *Clim. Policy* **19**, 1297–1309 (2019).
- Cejudo, G. M. & Trein, P. Pathways to policy integration: a subsystem approach. Policy Sci. 56, 9–27 (2023).
- Pérez, M. & Seerlay, Y. Cambio climático en América Latina: política pública y legislación para la adaptación. *Estado comunes* 1, 255–270 (2019).
- Guzmán, J. Liderazgo y rezago subnacional en la política climática de México: análisis cualitativo comparado de sus instrumentos. *Estado Comunes* 1, 19–37 (2023).
- Solorio, I., Carrillo, A. R. & Guzmán, I. M. La arquitectura institucional de la política climática de México: un análisis desde el enfoque de integración de políticas. *Estud. Polít.* https://doi.org/10.22201/fcpys.24484903e.2020.51.77182 (2020).
- Solorio, I. Leader on paper, laggard in practice: policy fragmentation and the multi-level paralysis in implementation of the Mexican Climate Act. *Clim. Policy* 21, 1175–1189 (2021).
- Sapiains, R. et al. Exploring the contours of climate governance: an interdisciplinary systematic literature review from a southern perspective. *Env. Pol. Gov.* **31**, 46–59 (2021).
- Solorio I., Guzmán, J. & Guzmán, I. Participatory decision-making in the policy integration process: indigenous consultation and sustainable development in Mexico, Policy Sciences, Springer; Society of Policy Sciences, vol. 56(1), pages 115–140 (2023).
- Foweraker, J. Grassroots Movements and Political Activism in Latin America: A Critical Comparison of Chile and Brazil. (Cambridge University Press, 2002).
- Solorio, I. & Tosun, J. Presidents and intermediaries: insights from clean energy policy processes in Mexico. *Policy Stud.* https://doi.org/10.1080/ 01442872.2022.2149724 (2022).
- Lampis, A. Vulnerabilidad y adaptación al cambio climático: debates acerca del concepto de vulnerabilidad y su medición. *Cuad. Geogr.* http://www.scielo.org.co/ scielo.php?script=sci\_arttext&pid=S0121-215X2013000200002&Ing=en&tlng=es (2013).
- 55. Gouritin, A. (ed.) Migrantes climáticos en México, FLACSO, México (2021).
- 56. Bárcena, A. & Joseluis S. (eds). La emergencia del cambio climático en América Latina y el Caribe: ¿seguimos esperando la catástrofe o pasamos a la acción? CEPAL https://www.cepal.org/sites/default/files/events/files/19-00711\_lbc\_160\_emergencia-cambio-climatico\_web.pdf (2020).
- López-Vallejo, M. & Schiavon, J. A. Sub-federal deliberative exclusions and free trade: Mexico's centralized federalism and weak institutional capacities. *Quebec J. Int. Law* 59–78. https://doi.org/10.7202/1090917ar (2022).
- Lechón Sánchez, W. Acción frente al cambio climático: gobernanza multinivel de los gobiernos subnacionales y locales en Ecuador. *Estado Comunes* 1, 39–59 (2023).
- Valenzuela, J. M. Climate change agenda at subnational level in Mexico: policy coordination or policy competition? *Env. Pol. Gov.* 33, 188–199 (2014).
- 60. Monroy, G. & Cortés, S. Gobernanza Climática en México: vínculos horizontales y verticales de los gobiernos estatales y municipales. In I. Solorio (ed.), México ante la encrucijada de la gobernanza climática. *Retos Insti.* http://ciid.politicas.unam.mx/www/libros/mexico\_gobernaznaclimatica\_instituciones\_solorio.pdf (2021).

 Tosun, J., Saad, E. L., Glückler, J., Irigoyen Rios, A. & Lehmann, R. Country-specific participation patterns in transnational governance initiatives on sustainability: preliminary insights and research agenda. *Glob. Chall.* **2023**, 2300012 (2023).

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#### AUTHOR CONTRIBUTIONS

The main author is solely responsible for the conceptualization, methodology, investigation, and writing of this work.

## **COMPETING INTERESTS**

The author declares no competing interests.

#### ADDITIONAL INFORMATION

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