
CLIMATE CHANGE & FEDERALISM

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1. Introduction

For several decades, there has been an overwhelming scientific consensus that anthropogenic sources of greenhouse gas (GHG) emissions are leading to significant increases in global temperatures and disrupting global climatic process that may have catastrophic consequences for the planet and populations around the world (IPCC 2014). The impacts of climate change will threaten the lives, health, and livelihoods of the most vulnerable segments of the population, most notably in developing countries (Thomas et al. 2018). The large-scale threat posed by climate change requires that governments not only adopt measures to reduce the causes of anthropogenic climate change, but also take steps to adjust to the unavoidable impacts of global warming (Biesbroek and Lesnikowski 2018).

Despite clear scientific recommendations and an international consensus on the importance of combating climate change, GHG emissions have continued to rise and the world is on track to achieve a dangerous level of global warming that would have dire social and economic consequences (Masson-Delmotte et al. 2018). While there has been a dip in carbon emissions in many countries as a result of the COVID-19 pandemic and related control measures, this is a transitory occurrence that does little to alter the structural causes of the climate crisis or the long-term trends in global warming (Quéré et al. 2020). The extent to which states have adopted policies to enhance their climate resilience is still highly variable and largely insufficient.

Federalism has been a central piece in addressing the climate crisis around the world. For one thing, the majority of the largest emitters are either federations or have adopted systems of decentralized governance. Together, Australia, Brazil, Canada, China, Germany, India, Indonesia, Mexico, Russia, and the United States account for 63% of the world's GHG emissions annually [1]. The successful realization of the world's climate mitigation objectives in these key jurisdictions thus depends, in large part, on whether and how governments within federal systems can cooperate in a collective effort to reduce carbon emissions and catalyze the emergence of low-carbon societies.

In addition, as the emerging and likely consequences of a changing climate become increasingly apparent, governments at different levels must establish planning processes and initiatives focused on adapting to climate change.

Climate governance in the context of federalism has generated a burgeoning literature in the past fifteen years (Adler 2007; Balthasar et al. 2019; Harrison 2013; Jordaan et al. 2019; Rabe 2004). Research suggests that federal structures and practices have the potential to enhance, as well as hinder different types of efforts to address climate change under varied conditions (Balthasar et al. 2019; Steurer and Clar 2018). Drawing on this literature, this session paper provides a succinct analysis of key developments and challenges at the intersections of climate governance and federalism and identifies key policy issues likely to be encountered by practitioners working in this field.

2. Developments, challenges and opportunities in climate change and federalism

It is widely recognized by policy-makers and scholars that climate change is a problem of multi-scale and multi-level governance. For one thing, GHG emissions result from actions taken and choices made at the global, regional, local and individual levels. For another, the impacts of climate change affect ecological processes, ecosystems, and populations at and across a diversity of scales and boundaries. As such, an effective response to the climate crisis involves and links efforts pursued by multiple levels and forms of political authority (Bulkeley and Betsill 2005; Sainz de Murieta and Setzer 2019). This approach is explicitly enshrined in the Paris Agreement, which recognizes that provinces, states, and municipalities have a critical role to play in contributing to the realization of climate mitigation and adaptation objectives (UNFCCC COP 2015).

To explore how federations address the challenge of climate mitigation and adaptation, in this paper we will the (i) role of federal institutions, policies and politics; (ii) subnational capacities and action; and (iii) opportunities and challenges that result from the interactions between federal governments and federated entities in the design and implementation of climate policies.

2.1 Role of federal governments

A unique feature of responding to climate change in the context of a federation is that policy-making over environmental matters and related sectors (such as energy, agriculture, economic development, etc.) may be shared between, and require the engagement of, governments at the federal and subnational levels. Federal governments can play an important role in facilitating climate action by federated entities and thereby address gaps and limitations that may emerge in a purely decentralized approach (Buzbee 2005; Osofsky and Wiseman 2012).

In the field of climate mitigation, federal governments have established collaborative policy frameworks, networks, and support schemes that:

- enabled federated entities to share the financial burden of decarbonization (Schreurs 2012);
- provided models for renewable energy regulations (Strebel 2011);
- facilitated collaboration and knowledge-sharing between governments (Gordon 2015);

- reduced the barriers to the adoption of standards for energy efficiency and renewable energy in regions with more limited economic resources (Stadelmann-Steffen, Rieder, and Strotz 2020; Wurster and Hagemann 2019)

Likewise, federal structures have been shown to enhance resilience to climate change through co-funding arrangements, collaborative projects, and networks of experts that:

- make it possible to channel financial resources to meet the varying needs of affected regions;
- build capacity at the local level for assessing and managing climate risks;
- address underlying differences between jurisdictions in their exposure to climate impacts and their resources for adaptation (Clar and Steurer 2014).

Where vertical types of coordination are observed between different levels of government, national governments often establish national targets and represent the countries' interests in supranational or global forums, while subnational governments implement regulations to achieve these targets. This is observed in federal structures where central governments set standards that should be met in each of the jurisdictions, and lower levels of governments make local policies for their own constituencies (Engel 2006).

2.2 Role of federated units

Recent literature has identified in many governance structures a shift from the national to local levels, with more functions of the (national) state performed by subnational and local governments (Jordan et al. 2018). In federations, the shift of governance structures from the national level to the federated entities can make it possible to compensate for insufficient regulation at the national and international levels (Michaelowa and Michaelowa 2017). Subnational governments' climate mitigation actions, in general, are understood to be able to help countries deliver and, in some cases, over-achieve current national pledges under the Paris Agreement (New Climate Institute 2019).

There are different reasons why federated entities might pursue policies to reduce their carbon emissions. For example:

- Economic considerations: renewable energy, energy conservation, and expertise to foster a low-carbon economy are promoted not only because they contribute to reducing greenhouse emissions, but also because they fall into the regions' economic self-interest (Rabe 2011: 501-502). This is the case of policy tools to promote "home grown" energy sources that are found in most states in the US (Rabe 2008).

- Strategic political considerations: With physical risks attributable to climate change becoming more evident, there is an “impetus for a policy response”, however modest the impact of unilateral state efforts to reduce greenhouse gas emissions may be (Rabe 2008). At the same time, in some federations, individuals will support unilateral policy initiatives undertaken by their respective state and provincial governments (Lachapelle et al. 2012).
- Leadership: many federated entities choose to be “first movers”, often with the explicit intent of taking national leadership roles on climate policy (Rabe 2008). Related to this point, states provide venues for alternative approaches to policy formation, and policy entrepreneurs form networks that support policy strategies that are particularly appealing to individual states (Rabe 2008).
- In the realm of climate adaptation, federated entities are also increasingly confronted with the challenge of ensuring they are resilient to the mounting and significant social and economic impacts of climate change. Reasons why federated entities pursue adaptation action include:
 - Framing: the development of adaptation policies and action has traditionally been framed as a local problem, falling largely under the responsibility of regional governments and local communities (Climate Chance Association and Comité 21 2019: 33).
 - Increase resilience: regional adaptation action aims to reduce weather- and climate-related vulnerability and exposure, as well as increase resilience in urban and rural areas. Options include building seawalls, implementing cooling centers and green infrastructure, establishing resilient water and urban ecosystem services, urban and peri-urban agriculture, and adapting buildings and land use through regulation and planning (Masson-Delmotte et al. 2018).

2.3. Opportunities and challenges

Decentralized and experimental climate policy-making can emerge in a context of bottom-up climate policy-making that fills a void left by federal inaction (Rabe 2008) or as part of a multi-level policy framework in which federated entities are given the autonomy to adjust and innovate with the implementation of climate policies (Sabel and Zeitlin 2008).

To begin with, the cross-cutting and wide-ranging nature of both mitigation and adaptation policy-making entails engaging with responsibilities that are often held by or shared with local and regional governments in federations. Most notably, the dispersion of relevant competences between federal and federated governments includes sectors such as land-use planning, natural resources, transportation, water management, emergency planning, and healthcare (Galarraga et al. 2011; Glicksman 2010). By granting responsibilities to local and regional governments federalism makes it possible for one level of government to adopt climate policies to compensate for the void left by another level of government's inability or refusal to address climate change (Derthick 2010).

For instance, in the context of federal inaction on climate change by the Bush administration in the United States, multiple states proactively adopted policies to reduce their carbon emissions during the 2000s (Rabe 2008). Similarly, in the second half of the 2000s, several Canadian provinces developed policies to reduce their carbon emissions to address the gap in federal leadership created by the Harper government's failure to address climate change (Bélanger 2011; Harrison 2012).

In addition, many local and regional governments have developed policies to adapt to the impacts of climate change in contexts where national adaptation efforts have been insufficient or lacking and have emerged as the key players in adaptation policy-making in many jurisdictions (He 2018; Westerhoff et al. 2011). A reverse form of compensatory climate governance may also manifest itself, with the federal governments adopting climate policies to make-up for the unwillingness of federated entities to take steps to reduce their carbon emissions. Examples of this sort of top-down gap-filling were observed in the United States under the Obama administration and in Canada since the election of Justin Trudeau's government (Jordaan et al. 2019).

Another opportunity arises from the autonomy granted to federated units over the design and application of climate policies. Granted autonomy, federated entities are able to draw on their skills, knowledge, and resources to establish climate solutions that are tailored to their particular economic, environmental, and social circumstances (Adler 2007; Galarraga, Gonzalez-Eguino, and Markandya 2011; Schreurs 2012).

Indeed, often there are significant differences between regions within federations in terms of the make-up of their economies and their carbon intensity, their natural resources, their exposure to different climate risks, their public institutions and capabilities, their expertise on climate issues, and their unique political dynamics and cultures (Bélanger 2011; Houle et al. 2015; Lachapelle et al. 2012). However, decentralized action may also have significant drawbacks for tackling a global problem like climate change (Adler 2007; Harrison 2013). Adopting climate policies in the absence of common standards or a broader institutional framework may result in a fragmented patchwork of climate policies adopted by different federated entities that work at cross-purposes with another (Gordon 2015).

Detrimental climate policy fragmentation in federations has been identified in relation to varying levels and forms of support for the deployment of renewable energies (Beermann and Tews 2017; Schmid et al. 2019), technical standards for greening buildings and low automobile fuel emissions (Karapınar 2019; Steurer and Clar 2015), and multiple carbon markets that are incompatible and limit the scope of carbon trading between jurisdictions (Gulbrandsen et al. 2018).

An uncoordinated set of climate policies can generate inefficiencies that hinder the transition to decarbonization for economic actors and sectors that operate across federated entities and fail to take advantage of the economies of scale that can be generated through harmonized standards and carbon markets.

In addition, decentralized climate action also has the potential to result in counterproductive forms of carbon leakage in which stringent efforts reduce carbon emissions in one jurisdiction are offset by an increase in carbon emissions generated in another jurisdiction that continues to promote the production and use of carbon intensive economic sectors (Harrison 2013). Similarly, decentralized and uncoordinated processes of policy-making in the field of climate adaptation could also generate gaps and negative spill-overs (Biesbroek and Lesnikowski 2018).

While it is true that climate impacts are often localized in one sense, these are nonetheless tied to transformations and disruptions in ecosystems and ecological processes that often straddle several jurisdictions and which may benefit from a coordinated response on the part of governments across multiple scales (Keskitalo et al. 2016; Leck and Simon 2018).

Furthermore, increased levels of polarization over climate policies and shifts in the political leadership of federal and federated governments can result in increasing contestation, where governments at one level take action to encumber or shirk the implementation of ambitious climate policies at another level. Striking examples of this sort of opposition include the Trump administration's legal challenge against California's fuel emissions standards and its agreement to link its cap-and-trade system with Quebec, and the constitutional references launched by conservative governments in Alberta, Ontario, and Saskatchewan against the carbon pricing backstop adopted by the Liberal government as a key component of its pan-Canadian framework for climate governance.

It is important to note that opportunities and challenges often co-exist. The case study of climate adaptation processes relating to flood management and tourism in Austria is illustrative. In this case, federal political structures fostered the emergence of a coordinated set of effective policy responses across multiple levels of government (Clar and Steurer 2014).

While the governance of flood risks and the tourism sector is characterized by significant fragmentation in terms of the powers and fiscal capacities held by the municipalities, provinces, and the federal government, this has not hampered Austria's ability to enhance its resilience to climate change. This vertical fragmentation was overcome through federal co-funding arrangements and collaborative projects that made it possible to channel financial resources to meet the varying needs of affected regions and address underlying differences in their exposure to climate impacts and their resources for adaptation (Clar and Steurer 2014, 20-24). In addition, the different levels of government in Austria have established a multi-level sectoral network of experts in water management that share a policy commitment to enhancing resilience to the risks posed by floods. The practice of federalism in the context of climate adaptation in Austria therefore "fostered experimentation, mutual learning, and a race to the top rather than the opposite" (Steurer and Clar 2018, 260).

3. Conclusion

In many ways, the world's efforts to achieve carbon neutrality hinges on the ability of a relatively small number of federations to rapidly transition away from carbon intensive economic activities and lifestyles. Climate governance in federal systems involves extensive horizontal and vertical interaction among federal, state, provincial, and municipal policy-makers, private sector leaders, and civil society representations. The complex mosaic of climate actions adopted within many federations raises important questions regarding how different mechanisms and practices can foster climate governance.

In principle a well-functioning federal state should be well positioned to facilitate the gradual emergence of an effective system of multilevel climate governance in which federal and federated governments collaborate with one another to develop and implement synergistic climate policies that draw on their expertise and resources, thereby striking an appropriate balance between centralization and decentralization

But the opportunities and challenges for addressing climate change in the context of federal polities are different from one jurisdiction to another and they evolve over time. By paying attention to how federal structures influence initiatives for both decarbonization and climate resilience it is possible to have a nuanced understanding of the ambivalent relationship between federalism and different aspects of climate governance.

Discussion questions

1. Why are federal & multilevel governments around the world important players in addressing climate change?
2. What are the likely key challenges that policy makers will encounter in federal-subnational intergovernmental relations when designing and implementing climate policies in the next 10 years?
3. How have/are different federal & multilevel governments around the world addressing these challenges currently, and how might they do so in the future?

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