

# 11

## Climate Governance and Federalism in Mexico

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### 11.1 Introduction

The chapter addresses key elements of climate policy in Mexico and implementation within the framework of a highly centralised federal system.

Mexico accounts for 1 per cent of global greenhouse gas (GHG) emissions, primarily from the burning of fossil fuels for transportation and the generation of electricity. Other contributing activities are agriculture, the oil and gas industry, and waste. The country is highly vulnerable to climate change, particularly because it is on the route of the most frequent tropical storms on the continent. Seventeen out of thirty-two Mexican states are coastal and concentrate around 47 per cent of the population.

Responsibility for climate change governance in Mexico is shared between the federal, state, and municipal governments. The federal government is responsible for national strategies and policy, as well as strategic areas based on sectors. Its General Climate Change Law establishes principles, planning, management, information and participation, and intersectoral and intergovernmental coordination mechanisms. Structural challenges still prevail, though, in policy implementation, hampering adaptation and mitigation efforts. The General Climate Change Law provides states with the responsibility to legislate and implement policy for transportation, commercial facilities, residential sources, special waste, agricultural and livestock activities, and others within their jurisdictions. While some of the thirty-two states are highly active and engaged in climate action, others lag behind in identifying climate risks and in implementing policy responses to the ever-present challenges that climate change poses to ecosystems and their population. States and municipalities have the authority to design and implement their own policy instruments with a wide margin of flexibility and innovation for mitigation and adaptation in as much as they are aligned with the national climate policy.

Mexican climate federalism allows subnational governments to tailor national climate policies to their specific needs and capabilities. Progress in climate policy

implementation varies across the country, and there are contrasts and disparities in the definition of objectives or goals with the national policy.<sup>1</sup> Therefore, a high degree of coordination is needed among the three levels of government for effective climate action. This also demands a more structured coordinated strategy at the federal level.

The State of Yucatan is a good example of local action that is advancing the climate agenda. Yucatan has recently issued specific climate legislation, and has developed a diagnostic that serves as the basis for mitigation and adaptation action. It has maintained a regional and local approach to mitigation and adaptation incorporating state and municipal authorities, and it has integrated climate change into its state development plan and derived state policy.

## 11.2 Background and Context

### 11.2.1 Contributions to Climate Change

Mexico contributes approximately 1 per cent of global GHG emissions. In 2019, total GHG emissions were 736.63 Mt of CO<sub>2</sub>e, according to the National Greenhouse Gases and Compounds Emissions Inventory (or INEGyCEI as per its acronym in Spanish). Fossil fuel combustion produced 63.52 per cent of total emissions, with the burning of fossil fuels to generate electricity contributing 23 per cent and the transportation sector 20 per cent.

With 50.3 million vehicles on the streets in 2020, transport is a natural target for mitigation action (INEGI 2021). The National Strategy for Climate Change (2013) considers that sustainable mobility is a sector that should be delivering results in a ten-year period and foresees different objectives, strategies, and actions, including increasing energy efficiency and developing a national electromobility strategy with public transportation projects in each state. However, public transportation is the responsibility of state authorities, and they face difficulties in reforming this sector because of unions' and private car owners' resistance. This often results in a lack of appropriate planning, ineffective governance, and poor clean air and climate benefits.

### 11.2.2 Impact of Climate Change in Mexico

Due to its geographical location and characteristics Mexico is highly vulnerable to the adverse effects of climate change. It has 11,000 kilometres of coastline and is within the most frequent route of tropical cyclones in the region. This is compounded by social and economic issues, which greatly exacerbates Mexico's vulnerability to climate anomalies. The Global Climate Risk Index for 2018 ranked Mexico 26th in risk and 10th in deaths out of 177 countries analysed

(Germanwatch 2020). It is estimated that 70 per cent of the country's population could be affected by climate change.

In the Special Climate Change Programme 2014–18, the federal government projected changes based on a scenario where the temperature increases between 2.5°C to 4.5°C and precipitation decreases by 5 and 10 per cent. This was projected considering 1961–90 temperature and precipitation averages. These projected changes are foreseen in part by the amount, intensity, and socioeconomic consequences of the storms, and also because of the changes in rain patterns with severe droughts in the north of the country, and floods mainly in the south. However, the impact on agriculture, coasts, ecosystems and biodiversity, and strategic infrastructure is no less important.

The socioeconomic and ecological Mexican trends, including urbanisation and pressures on natural resources due to economic and population growth, suggest that under a business-as-usual scenario, climate risks will exacerbate other problems in the country (SEMARNAT–INECC 2016, 12). An example of this is public health. The Federal Commission for Protection against Health Risks (*Comisión Federal para la Protección contra Riesgos Sanitarios* or COFEPRIS) indicates that protecting human health will represent a challenge under climate change scenarios. Fifteen per cent of the territory, 68 per cent of its population, and 71 per cent of its gross domestic product are highly exposed (COFEPRIS, 2017). Challenges here include differentiated temperature increases, change of precipitation patterns, advance in the occurrence of the hot season, extreme weather events, increase in desertification, deforestation, disappearance of glaciers, increase in the sea level, and health problems.

Between 1999 and 2017, disasters with a climate-related declaration were significantly higher in Mexico. The years 2010 and 2013 stand out, representing the highest expenses in climate-related disasters. The most damaging events have been, overall, the tropical cyclones Manuel and Ingrid in 2013. In general, meteorological events in the country (tropical cyclones, landslides, floods, droughts, and severe storms) classified as 'disasters' by the National Centre for Disaster Prevention (CENAPRED), despite certain oscillations, show an increasing trend along with annual average costs.

To address these occurrences and their costs, the Mexican government has two policy instruments: one preventive, the Fund for the Prevention of Natural Disasters (FOPREDEN); and one reactive, the Fund for Natural Disasters (FONDEN). The burden of social costs associated with adverse effects of climate change is on the local communities or local stakeholders, such as municipalities, state authorities, or private stakeholders. In the period between 2012 and 2015, FONDEN's funding (reactive) were seventy-eight times higher than FOPRE-

DEN's (proactive) funding. FONDEN is utilised mostly for loss and damages where there has been a declaration of a disaster. Therefore, local stakeholders have to undertake remediation actions when hydrometeorological events strike a given territory with little or non-existing capacity to address the direct and spillover effects of these climate related events fully (INECC–SEMARNAT 2018; SEMARNAT 2019).

### *11.2.3 Commitments in Relation to Climate Change*

Mexico is an active participant in international processes related to climate change and sustainable development. The country adopted the United Nations Framework Convention on Climate Change (UNFCCC) in June 1992, and it has been a party to the Kyoto Protocol since 1998 (Edwards et al. 2015). This has supported Mexico's mitigation efforts and its capacity to establish inventories, clean development mechanism projects, and other mitigation actions. In 2010 Mexico hosted and chaired the 16th Conference of the Parties to the UNFCCC in Cancun. Its commitment helped to renew the world's interest in addressing climate change and in seeking innovative and creative means for mitigation and adaptation.

In preparation for the adoption of the Paris Agreement at COP 21, Mexico submitted its INDC (Intended Nationally Determined Contribution) on 30 March 2015, becoming the first developing country to include not only ambitious goals in mitigation, but also adaptation pledges in the social ecosystems and productive systems. In 2016, Mexico signed the Paris Agreement.

#### *11.2.3.1 Nationally Determined Contribution Commitments*

Mexico's INDC considered a reduction of 22 per cent of its total GHG emissions and a decrease of 51 per cent of black carbon. Black carbon, or soot, is part of the particulate air pollution (PM<sub>2.5</sub>) and contributes to climate change. It is one of many particles that are emitted when diesel, coal, and other biomass fuels are burned (Climate & Clean Air Coalition). Under this framework, emissions intensity per unit of GDP are scheduled to be reduced by around 40 per cent between 2013 and 2030. The document foresees actions for communities, *ejidos* (a form of traditional town with rights over a specific territory), unions, non-governmental organisations and other groups of citizens; implementation of an ecosystems-based approach; and adaptation of strategic infrastructure and productive systems. The adaptation actions include ensuring food security and water access, comprehensive watershed management biodiversity and land conservation, increasing adaptive capacity through early warning systems, risk management, hydrometeorological monitoring at all orders of government,

reducing by at least 50 per cent the number of municipalities classified as most vulnerable, and reaching zero deforestation by 2030.

The states were not involved in the design of the 2015 INDC pledge. They only became involved after the NDC submission in the context of the National Climate Change System (SINACC). In a survey carried out by SEMARNAT and INECC in 2016, eighteen states responded that key areas of action were within their authority: residential and commercial (25 per cent), transportation (25 per cent), AFOLU (14 per cent), agricultural and livestock management (13 per cent), residues (11 per cent), power generation (5 per cent) and industry (5 per cent).

For the update of the NDC (currently Nationally Determined Contributions) in 2020, the adaptation component was strengthened through five axes: prevention and mitigation of adverse effects, resilience and food security, conservation, restoration and sustainable use of biodiversity, integrated management of water resources, and protection of infrastructure and tangible cultural heritage. Synergies with Agenda 2020 were also identified. Mitigation commitments in the NDC update were identical to those in 2015: 22 per cent reduction in GHG emissions and 51 per cent in black carbon as unconditional reductions by 2030. Not adopting more ambitious targets in its mitigation pledge has been criticised by the national and international community (Climate Action Tracker 2021). However, this pledge was in line with the 2018 reform to the General Law on Climate Change.

### 11.3 Federalism and Climate Change Policy

Mexico is a federal republic with thirty-two constituent units: thirty-one states and Mexico City. These are divided into a total of 2,458 municipalities and sixteen territorial demarcations in Mexico City. Climate change is a shared responsibility spanning federal, state, and municipal governments. This shared responsibility is further outlined by the General Law on Climate Change. The Federal Ministry of the Environment, otherwise known as SEMARNAT, is responsible for issuing the national climate change policy, implementing the national climate change system, and other climate policy instruments in the information, public participation, standards, and management of an emissions registry and an emissions trading system. The Federal Ministry of Finances is responsible for administering the Carbon Tax. This has been in place since 2014 and it is applicable to the sale and importation of fossil fuels. The amount to be levied is calculated based on the amount of carbon in each fuel (for example, in 2022 propane is taxed with 8.2987 cents [MXN] per litre, this is the minimum amount charged. On the other hand, carbon coke is taxed with 51 pesos [MXN] per ton, other carbon fuels are taxed with 55.8277 pesos [MXN] per ton). Natural gas is exempt from the tax (Special Law for Products and Services, article 2.1 (H), DOF, 2013–22). There is not a

special destination for environmental or climate projects stemming from the amounts levied for this tax.

State authorities make policy in urban planning and development, transportation, land use, and waste in accordance with the Federal Constitution. Municipalities are also responsible for making and implementing policy related to municipal waste, transportation, and urban planning, consistent with federal and state policy.

### *11.3.1 Introduction to the Mexican Federal System*

While states are sovereign in their internal regime in accordance with the Federal Constitution (CESOP 2006), Mexico represents a paradoxical case of a federal country with a highly centralised form of government, due mainly to the historic social, economic, and political power concentration in Mexico City.<sup>2</sup>

Domestic implementation of international commitments varies according to the subject matter in question. The Mexican legal system, primarily determined by the Federal Constitution, determines those areas where there are shared, common, or exclusive responsibilities. Environmental protection and ecological equilibrium are shared responsibilities. The Federal Congress has the authority to enact legislation that distributes authority among the three spheres of government. Legislation stemming from such processes is known as a General Law. In this vein, environmental legislation comprises a myriad of general laws where the General Law on Ecologic Equilibrium and Environmental Protection is known as a framework legislation. The General Law on Climate Change (GLCC) is part of the series of laws addressing environmental subject-matter related areas, such as biodiversity, residues, and forestry.

The GLCC (articles 7, 8, and 9) establishes authority and concurrent responsibilities of the federal, state, and municipal authorities. Formulation and management of climate policy, financial resource management, promotion of scientific and technological development, education and climate culture, capacity building, the application of incentives and compliance monitoring are present in each level of government. However, boundaries between the jurisdictions of different orders of government are often blurred and decentralisation policies have accentuated these overlaps. Therefore, it is increasingly clear that the design and implementation of effective public policies require formal and informal intergovernmental coordination, ensuring cooperation between the three orders (Flamand 2010).

The federal government is responsible for designing national policy instruments, issuing regulatory provisions and official standards, establishing public consultation processes with society, summoning the states and municipalities for the

development of concurrent activities, proposing budget forecasts, and issuing recommendations to states and municipalities. Energy regulation and regional and demographic development are reserved for the federal government. Together, the federal government and the states are responsible for agriculture, education, food safety, and the prevention and care of diseases linked to climate change, education, and research. In states and municipalities, powers are concentrated on the protection of natural resources of their jurisdiction (although permits and authorisations are of federal nature) and on waste (other than hazardous) management.

Provisions included in the GLCC do not acknowledge differences in the degree of human and institutional development found in states across the country. It does call upon states to develop their climate change programme that should address a number of elements from transportation, urban development agriculture, livestock management conservation and natural resources restoration under their scope of authority (e.g., state protected areas), food security, infrastructure, education, land use, urban development, civil protection, and diseases prevention and attention. States are responsible for implementing their own greenhouse gases and compounds inventories and developing and implementing their risk atlases.

### *11.3.2 Climate Policy and Federal Governance*

Congress, comprising the Chamber of Deputies and the Senate, has the responsibility of passing legislation on climate change. Executive authorities are responsible for acting on climate change, environmental and sustainable development. Several ministries are responsible for contributing to the design, implementation, and evaluation of climate policy. The Ministry of Environment and Natural Resources (SEMARNAT) and its technical support agency, the National Institute of Ecology and Climate Change (INECC), play a leading role.

SEMARNAT is responsible for formulating and conducting the national policy on climate change (Diario Oficial de la Federación (DOF)); Ley Orgánica de la Administración Pública Federal (1976); Reformada el 22 de enero de 2020). INECC, on the other hand, is responsible for conducting scientific and technological research and sectorial forecasting analysis, and for participating in the development of strategies, plans, programmes, instruments, and actions related to climate change (INECC – SEMARNAT 2015). INECC supports technical NDC-related work through assessing options to achieve mitigation or adaptation targets by identifying pathways and corresponding costs (Partnership on Transparency, 2019).

States issue legislation implementing the GLCC in sectors such as transportation, forestry, waste management, land use, planning, agricultural and livestock management, education, and health. State legislation is mandatory for municipalities within their territory. Municipalities are responsible for waste management,

planning, and land use according to specific legislated authority stemming from national or state provisions.

The Mexican Constitution enshrines the human right to a healthy environment and sustainable development. The Constitution has a clause that contains ‘interpretation in conformity’ and the *pro personae principle*. Pursuant to these, any international treaty enshrining human rights provisions that is signed and approved by the Senate shall be interpreted in the same legal form as the Constitution. The National Human Rights Commission has authority to address any claim pertaining to violation of human rights in the environmental and climate change realms. There is a human rights commission in each of the thirty-two federal entities and they can also address human rights violations related to environmental issues or climate change.

### ***11.3.3 Laws, Policies, Institutions, and Initiatives Developed for Climate Mitigation and Adaptation***

The National Climate Change Policy includes planning, information, management, coordination and implementation, financing, monitoring, and evaluation instruments spanning over the three spheres of government. The most important elements for the case of Mexico are indicated below.

#### *11.3.3.1 Legal Framework*

The GLCC, which came into force in October 2012, is the main climate policy instrument in the country. This legislation defines planning and policy instruments, institutional arrangements, and provides general guidance for the implementation of climate policy. It also incorporates a long-term, systemic, decentralised, participatory and integrated approach for adaptation and mitigation. Under the GLCC, the Federal Government is mandated to formulate and guide national climate change policy. The role of subnational government is also clearly specified, including the elaboration of state-level GHG inventories and climate programmes (SEMARNAT-INECC 2016, 12).<sup>3</sup> In the same vein, GLCC determines a series of economic, political, information, education, and research instruments that require the co-responsible participation of society (INECC-SEMARNAT 2015, 60).

Based on articles 8 (sections I and XI) and 11 of the GLCC, states have the authority to formulate, conduct, and evaluate their respective policies on climate change following the national policy framework. State governments issue their own state climate change laws. By November 2021, two states, Campeche and Sinaloa, lagged behind in the responsibility to issue legal provisions aimed at



addressing climate change. Thirty states have either adjusted their environmental legislation or issued specific climate legislation.

### *11.3.3.2 Planning Instruments*

The National Climate Change Strategy, issued in May 2013, provides the long-term vision for the country with a time horizon of ten, twenty, and forty years to guide climate change policy. It is the basis for a Long-Term Climate Strategy. The National Strategy also incorporates short-lived climate pollutants emissions reduction into national policy. According to the GLCC, the Strategy must be reviewed at least every ten years in mitigation and every six years in adaptation – addressing any differences between projected estimations and the evaluated results. Likewise, the corresponding scenarios, projections, objectives, and goals can be updated based on best information and evaluations. As of October 2021, the update on adaptation has not been issued.

Aligned to the National Strategy, each federal administration has the mandate to develop its Special Climate Change Programme. These stand out as the flagship planning documents for the administration's six-year term. The programmes must include specific objectives, goals, actions, and means for implementation.

States are also responsible for preparing and implementing their climate change programmes, promoting social participation (article 8, GLCC), considering their specific powers, resources, and relevant state level regulations. The GLCC mandates states to carry out their programme on climate change and to establish criteria and procedures to evaluate and monitor compliance. These programmes establish the strategies, policies, guidelines, objectives, actions, goals, and indicators to be implemented and complied with during the corresponding government period, in accordance with the National Climate Change Strategy and the Special Climate Change Programme. INECC reviewed state programmes in 2019; only twenty-five states had issued a programme on climate change. Six states (Aguascalientes, Guerrero, Puebla, Queretaro, Nuevo Leon, and Zacatecas) had not issued a climate change programme, meaning that their ability to implement climate change action was limited due to a lack of diagnosis on vulnerability and sources of GHG. SINACC could play a role in reviewing state programmes and help states adopt policies incorporating advances in the characterisation of vulnerability and GHG sources.

### *11.3.3.3 Institutional Arrangements*

The National System for Climate Change (SINACC) coordinates government bodies and consults with the public, private, and social sectors on salient climate change issues. SINACC comprises: (i) the Inter-ministerial Commission on Climate Change (CICC), a body of fifteen Federal Ministries; (ii) the National

Institute for Ecology and Climate Change (INECC); (iii) the Congress; (iv) thirty-two Federal States; (v) the national associations of municipal officials; and (vi) the Climate Change Council (C3), which consists of at least fifteen experts from civil society (SEMARNAT–INECC 2016, 13). SINACC serves as a permanent mechanism for communication, collaboration, coordination, and consultation on the national climate change policy. It is also a forum for the promotion and coordination of national policy on climate change in the short, medium, and long terms, with a cross-cutting perspective aiming at the implementation of mitigation, adaptation, and vulnerability reduction policies, programmes, and actions to face the adverse effects of climate change (INECC-SEMARNAT 2015).

States participate in SINACC through their environmental authorities; other sectoral authorities such as urban planning or human development often take part in these sessions. SINACC must meet at least twice a year. However, most SINACC meetings have been limited to information sharing, and very few agreements have been reached to advance climate action (SEMARNAT 2020). It has thus shown limited ability to nurture and promote effective implementation of climate policy. Local governments still lack knowledge about SINACC and about the relevance of their participation therein – a situation that is not helped by the short electoral cycles, especially at the municipal level. Participation of the municipalities in SINACC is through their associations, which dilutes direct responsibility of municipalities in this forum. Because of the relevance of SINACC, more active participation of states and municipalities, and a more efficient agenda could help states and municipalities addressing needs and identifying opportunities to enhance climate action.

#### *11.3.3.4 State Climate Policy*

State climate policy areas include planning, information for decision making, coordination, management, public participation, education, research financing and evaluation.

Planning instruments include the design and implementation of a State Programme on Climate Change. A climate programme addresses key elements to identify effects of climate change in state territory. The plan is expected to be aligned with the National Strategy and the Special Programme on climate change. However, outdated plans do not reflect this alignment (ten plans out of twenty-five). Actions in the plan are geared towards preservation, restoration, and sustainable management of ecosystems and hydrological resources in their sphere of competence; food safety; agriculture and livestock management, rural development, fisheries and aquaculture; education; efficient and sustainable transportation; infrastructure; human settlements and development planning; environmental protection and natural resources; special management residues;

civil protection and prevention and attention of diseases linked to climate change. The programme should encompass procedures for public participation, follow-up and compliance monitoring, including impact indicators for mitigation and adaptation action.

In information for decision making, states have the responsibility to issue their GHG inventory. Prepared with technical support from the INECC, the inventory identifies sources of GHG and mitigation actions. By 2019, twenty-eight states had a GHG inventory in place. However, not all of these are updated; methodology for their implementation varies across the board and in very few cases, inventories are comparable or compatible with the National Emissions Inventory.

Eighteen states have intersectoral coordination commissions; not all have a solid work programme in place. The Mexico City Climate Commission has met only once since its creation. The Inter-secretarial Commission in the State of Mexico also only held one meeting, at its onset. There are other examples, such as the state of Guanajuato, where environmental authorities have made strides in cross-sectoral coordination. The State of Veracruz initiated a cross-sectoral work through the office responsible for implementing its sustainable development goals to 2030, which is linked to the office of the state governor.

State risks atlases stem from civil protection legislation, but are recognised as a vehicle for identifying climate risks in the climate legislation; not all states have an updated and comprehensive risk atlas that addresses current and future climate-related risks. INECC issued a National Atlas for Climate Change Vulnerability in 2018. It addresses six areas of climate vulnerability at the territorial level of a municipality. States – and municipalities – are progressively looking at the National Climate Vulnerability Atlas and considering its recommendations for their own domestic climate programmes or risk atlases.

At the federal level, the National Register for GHG includes facilities that emit 25,000 tons of CO<sub>2</sub>e or more than that amount of GHG. At the local level, states have not put in place registries for GHG state-jurisdiction sources.

States have the authority to issue specific standards and technical guidance – as long as their own respective legislation provides for it. There are examples of environmental standards in Mexico City regarding renewable or clean energy for certain energy intensive business, standards for volatile organic compounds emissions and others for conservation lands or ecological agriculture in its territory. Transportation, however, is an area where state environmental standards could serve to limit GHG emissions and other pollutants. The emissions verification programme in the metropolitan area of Mexico City is one of such cases where without being labelled as standards, administrative provisions serve as guidelines for internal combustion vehicles emissions and for providing exemptions for electrical and hybrid vehicles.

States are responsible for including public participation in their efforts to design, implement, manage, and evaluate climate policy. This is often implemented through consultations and processes foreseen in state legislation. However, public participation is only as worthwhile as the information available to the public for the nurturing of informed opinion. Regarding education and research, states show different degrees of engagement and development in mitigation and adaptation programmes all across the different levels of instruction from elementary to professional degrees.

States such as Puebla, Tamaulipas, Guanajuato, Yucatan, and more recently Sonora, have shown interest in clean and renewable energy and have started to implement projects. Other states do not have the same degree of interest in advancing the climate agenda. Very few states have expressed their interest in implementing a preventive and proactive agenda for adaptation to climate change (Veracruz, Sinaloa), although most of its economic and social burdens rest with state or municipal authorities.

Financing is a necessary condition for successful climate action. States vary in their efforts and understanding of this basic element of policy management. While there are states that have clearly identified public budgets for climate action, others have incorporated specific trust funds for implementation of mitigation or adaptation actions. Other states have not identified specific funds for climate change and their budgets only include allocation for environmental management under their ministries of the environment. The federal budget does not include a specific section for state climate action. Funds from international cooperation agencies are available to support studies or capacity building efforts which may otherwise not be available.

In 2019, the Supreme Court ruled that states legislatures have the authority to establish environmental taxes, including carbon taxes. Reviewing the specific case of the state of Zacatecas, the Supreme Court ruled that the Constitution allowed states to determine such taxes. By December 2021, the State of Mexico and Baja California established a carbon tax, and Nuevo Leon and Yucatan set taxes on emissions.

Grounded on the constitutional right to a healthy environment for peoples' development and well-being, and on the state's role to serve as its utmost steward of these rights, Zacatecas was the first Mexican state to consider a tax on GHG emissions. This is aimed at charging 250 MXN pesos (12 US dollars) for emissions of tCO<sub>2</sub> and other GHG such as methane, N<sub>2</sub>O, HFC, PFC, and HF<sub>6</sub>. This tax is applicable to persons, enterprises, local or foreign that have productive units in the state, and other public entities with federal or state autonomy. GHGs will be taxed according to their global warming potential considering CO<sub>2</sub> in a ratio of 1.

After Zacatecas, the State of Mexico established a tax (fiscal year 2022). In this case, each CO<sub>2</sub> emission is taxed with 43 MXN pesos (approximately 2 US dollars) per ton. As per Decree 18 adopted in January 2022, tax levies will be used to improve the state's environmental condition and not solely for tax collection purposes. Expected tax levies are in the range of 80 million MXN pesos or around 3.8 million US dollars. Baja California's carbon tax is applicable to persons, legal entities, and economic units that have installations or sources where goods or products that generate emissions into the atmosphere are sold to final consumers within the territory of the state. In this case, the contents of tCO<sub>2</sub> are taxed per fuel: gasoline 2.196 kg/l; diesel 2.47 kg/l; natural gas 2.69 and liquified gas 3.00 kg/l. Each kilogramme is taxed with 0.17 MXN pesos. In Nuevo Leon, a new tax is being imposed on emissions of N<sub>2</sub>O and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) for every ton that surpasses the Mexican Official Standard (NOM, notably, NOM-043-SEMARNAT-1993 and NOM-085-SEMARNAT-2011). Yucatan, following the model of Zacatecas, is taxing GHG considering their GWP potential. Each CO<sub>2</sub>e ton emitted is taxed with 2.70 economic units or UMAs, corresponding to 198 MXN for the 2022 fiscal year.

Environmental taxes are surging as a response to the ever-present need for resources to address environmental degradation, and enhance the structural responses of local authorities to address those to adjust or design mechanisms that effectively address the environmental and climate crisis. Tax authorities will be in charge of enforcing these provisions and environmental authorities will be in charge of designing the mechanisms to utilise these resources in a way that truly advances environmental and climate policy.

A more comprehensive national strategy on tax action addressing greenhouse gases is still pending and most needed. SINACC could serve as the forum to design and implement an environmental and climate tax strategy.

Emissions' trading regulation is reserved for the federal authority (SEMARNAT). The federal mandatory system covers specific sectors (industry, oil and gas, and electricity generation) and only CO<sub>2</sub>. States can participate in this indirectly through fostering compensation projects (that can account up to 10 per cent of each regulated facility's emissions) or by fostering voluntary carbon markets allowing emitters to offset emissions by purchasing carbon credits (SEDEMA 2018). States have also shown interest in participating in REDD+ projects where there is a need to enhance local public and private participation; these include the states of Jalisco (SEMADET 2017), Oaxaca, Campeche, Quintana Roo and Yucatan (Almanza-Alcalde, 2022; CCPY 2021). The federal government has yet to issue guidance, however, on how these reductions will be considered to attain NDC targets.

In the evaluation of climate policy, INECC and the Coordination of Evaluation play a key role. Evaluations are intended to inform national policy improvement or readjustment (INECC-SEMARNAT 2015). In 2018, a subnational evaluation of six states and eighteen municipalities (three municipalities per state) was carried out. Results showed significant differences in the implementation of climate policy across states and municipalities (INECC 2018a). It also found that few states view climate change as an overall threat to social systems. The assessment showed important mitigation opportunities in power generation, transportation, and other areas such as waste management. It also demonstrated that little coordination effort is being made in these areas. SINACC has not implemented a strategy to coordinate climate policy implementation, which is most needed. This strategy could engage environmental and sectoral stakeholders and support the implementation of Mexico's NDC. Thus, opportunities arise for SINACC to host and advance a strategy that could enhance state action. In the adaptation realm, this evaluation revealed that municipalities hardly possess the understanding, technical abilities, or the necessary human resources to design or implement effective climate adaptation action. In most cases, risks or vulnerability to climate change are managed in a reactive approach.

The 2018–24 federal administration has prioritised the enhancement of public companies operating energy generation, distribution, and management. However, these companies have insufficient financial resources to invest in renewable energies, and are ill-prepared to compete with the private sector using cleaner technologies. On the other hand, state administrations have shown political will and commitments to renewable energy, despite some reluctance from the federal government, which claims that the national electricity grid needs to be revamped for a more efficient energy management and distribution in the grid. Notwithstanding, the federal government does not allocate appropriate resources for that overhaul in its 2022 budget initiative. At the national level, there are opportunities to implement projects to distribute energy generation through small-scale projects that might not need the national grid.

The last update of the progress of subnational climate change policy was made in 2019. INECC created a portal where the progress of the thirty-two states and some municipalities was gathered and disseminated (INECC 2021). INECC reviewed progress made by states and selected municipalities in the development of policy instruments. The review found that 75 per cent of the states have a state law on climate change, 78 per cent have a state plan or programme, 43 per cent have an inter-ministerial commission on climate change, and only 12 per cent make an inventory of emissions.<sup>4</sup>

## 11.4 Federal Governance and Climate Change: The Case of Yucatan

In Mexico, governance challenges have led to responses that are typically partial and fragmented. Advances in climate policy are concentrated at the federal level, while subnational governments are still making climate change a part of their government agendas, especially among state governments. Even in the most proactive states effective climate governance remains a challenge. Due to the flexibility of the Mexican federal system, and the fact that subnational governments have not been included in the delivery of NDC, most state initiatives are no longer in force or are not clearly aligned with national climate objectives. Mitigation efforts and programmes often are unclear about actual climate benefits. An exception is the state of Yucatan, which has made significant advances in the implementation of its climate policy. Yucatan serves as an example for effective cooperation and coordination between different levels of government looking at attaining national climate objectives.

### 11.4.1 Flexibility, Experimentation, and Innovation

Yucatan's climate action spans across the state, regional, and municipal levels: (i) it has a robust state policy framework with specific legislation in place; (ii) it is part of a *regional* initiative, in coordination with the two neighbouring state governments in the Yucatan Peninsula (Campeche and Quintana Roo); and (iii) through an *inter-municipal* association named *Pucc*, which addresses climate change among other topics of shared concern.

#### 11.4.1.1 State Perspective: State of Yucatan

After the publication of the GLCC in 2012, Yucatan's State Development Plan 2012–18 included objectives aimed at reducing the vulnerability of productive communities to climate change. Yucatan has an Inter-ministerial Commission on Climate Change established in 2010, and a Special Action Programme on Climate Change was published in 2014 with validity to 2018. The State's Climate Change Law was issued in November 2021.

Yucatan addresses climate change in several legal provisions. The issue is covered in five state laws: the Environmental Protection Law, the Law of Sustainable Rural Development Law, the Education Law, Sustainable Forest Development Law, and Conservation and Development of Urban Trees Law. In the case of the last two statutory bodies, climate change is only mentioned but no further provisions are included.

The Special Action Programme on Climate Change 2014–18 defined a roadmap for the substantial reduction of GHG emissions and strengthening local capacity to

increase the resilience of the social, environmental, and economic sectors to the effects of climate change by 2030. The mitigation objective is a low-emissions development, preserving the carbon sinks potential of natural areas in Yucatan. The adaptation objective consists of reducing the vulnerability of the state's social, productive, and environmental sectors by 2030 (to reduce the percentage of state GDP affected by losses derived from extreme weather events). The programme also defines strategies, lines of action, and indicators to monitor progress. In addition to being aligned with Mexico's NDC, the objectives and goals defined by the Yucatan government are also adapted to state priorities or conditions, emphasising the conservation of natural areas and the productivity of agricultural activities and forestry.

The Ecological Planning Programme – a key instrument for the effective implementation of climate policy at the subnational level – dates from 2005, and, as expected, it is not aligned with the national climate policy. The authorities of the three levels of government will need to coordinate to determine what would be the best activities to advance climate change and the origin of the necessary resource.

#### *11.4.1.2 Regional Perspective: Peninsula of Yucatan Agenda*

The Yucatan peninsula is in the southeast of the country and is divided into three states: Campeche, Yucatan, and Quintana Roo. This region is one of the most important touristic national and international destinations in the country, and it is also one of the most vulnerable to the effects of climate change.

An important part of the territorial perimeter of the peninsula is a transition zone from the Gulf of Mexico to the Caribbean. It is highly vulnerable to the adverse effects of climate change due to the interaction of elements in its coastal environment – exposure to hydrometeorological phenomena, impact on several species of flora and fauna, a sargassum upwelling on beaches in recent years, and an increased risk for lower productivity in regional agricultural production.

In 2010, at the Sixteenth Conference of the Parties (COP 16) in Cancun, Quintana Roo the states of the Peninsula agreed to join efforts and resources to address Climate Change (Coordinación sobre el Cambio Climático de la Península de Yucatan 2015). This regional alliance represents a governance model for subnational authorities to coordinate efforts and resources to undertake initiatives for mitigation and adaptation. It establishes the institutional cooperation framework to implement public policy, and a regional Commission on Climate Change working closely with the Inter-ministerial Commissions on Climate Change in each state of the Yucatan Peninsula.

The Regional Climate Change Commission foresees the participation of the environmental authorities of the three states, as well as a representative of the Federal Inter-ministerial Climate Change Commission (CICC). Strategies of the



Regional Commission are based on three 'Big Vision Projects' (Coordinación sobre el Cambio Climático de la Península de Yucatan 2015): (1) Reducing Emissions from Deforestation and Forest Degradation (REDD+) from forests and mangroves; (2) implementing the roadmap 'Articulation of policy instruments for adaptation to climate change in the Yucatan peninsula' prepared with the support of UNDP in 2013, which includes a Regional Adaptation Strategy for the Yucatan Peninsula, inter-institutional coordination, capacity building and the preparation of diagnoses and studies with a regional vision; (3) creation of the Yucatan Peninsula Climate Change Fund to obtain and distribute funds to mitigation, eliminating deforestation, and promoting environmental restoration and adaptation actions for ecosystems and local communities (Vallejo and Becerril 2018).

*11.4.1.3 Local Perspective: Puuc Inter-Municipal Biocultural Board, Intermunicipal Decentralised Public Agency (JIBIOPUUC)*

Yucatan is one of the states with the highest rates of biodiversity in Mexico, especially the *Puuc* (*puuc* in Mayan means hill) region located in the southern part of the state. The area is considered important for the environmental and landscape amenity it provides. In addition, this area has historical and cultural characteristics that come from the time of the ancient Maya with important ceremonial centres.<sup>5</sup> The 'Puuc Biocultural State Reserve' spans five municipalities: Muna, Oxkutzcab, Santa Elena, Tekax, and Ticul. This is an area of 135,848 hectares, according to decree 455 published in the Official Gazette of the Government of the State of Yucatan in November 2011.

In 2013, the five municipalities signed an Inter-municipal Cooperation Alliance for the Integrated Management of the *Puuc* Zone for the conservation and management of natural resources. In 2014, the Agreement for the Creation of the Intercultural Biocultural Board of Inter-Municipal Decentralised Public Organisations of Puuc (JIBIOPUUC) was published in the Official State Gazette. The JIBIOPUUC provides technical support to municipalities for the preparation, management, and implementation of projects and programmes related to the environment, natural resource management, and sustainable rural development applicable in their territories, foreseeing climate change among the issues to be addressed.

Municipalities and other stakeholders such as The Nature Conservancy, the German Agency for International Cooperation (GIZ), the REDD+ Alliance, the state's Secretariat of Urban Development and Environment and the National Forestry Commission, communities and municipalities and other relevant stakeholders have joined efforts to promote and implement projects to mitigate climate change, seeking to reach zero deforestation and environmental degradation, favouring best practices in sustainable production and organic agriculture.

In 2019, municipalities signatory to JIBIOPUUC adhered to the Global Covenant of Mayors for Climate and Energy, an international alliance for local and regional authorities that seeks to disseminate and to support actions to face climate change (Yucatan Ahora! 2019). The regional agreement for the Yucatan Peninsula features data on the region and its strategy on climate change (Portal of the Climate Change Strategy of the Yucatan Peninsula).

The case of Yucatan shows us the enriching experience of a state that manages climate policy with the participation of actors from the federal, state (cross-sectorial), and municipal governments, including international cooperation and non-governmental organisations. However, there was no explicit depiction of coordination for consistency or complementarity in the implementation of policies and programmes. This same pattern could also be identified in the participation of federal actors at the subnational level.

Yucatan has worked recently to integrate climate policy into its planning instruments, as well as to address the issue from different spheres and in coordination with other state, local, and federal actors. This dynamic has occurred thanks to the leadership and political will of this particular state, a situation that is not observed in the rest of the country in the same way. The state's 2018–24 Development Plan considers climate change as an issue that needs to be addressed for sound economic, social, and environmental development (Gobierno del Estado de Yucatan 2019). The State Development Plan builds upon climate policy instruments such as the National Atlas for vulnerability. It also seeks to advance to a low emissions economy by means of mitigation action on the industrial, agricultural, commercial, and services sectors. Currently Yucatan is preparing specific legislation on climate change with support from the United Kingdom Partnership for Accelerated Climate Transitions (UK PACT).

## 11.5 Conclusion

Emissions in Mexico have grown since the early 1990s, but these emissions, notable in the energy and transportation sectors, have slowed their rate of growth in recent years. Because of its geographical and environmental characteristics, coupled with its social and economic problems, the country is highly vulnerable to the adverse effects of climate change. States and municipalities bear the political, social, and economic burdens and costs of hydrometeorological events. Financing, technical, and logistic capabilities are unevenly distributed across Mexican states.

Mexico has played an important role in the development of the international climate change agenda and in promoting and fostering compliance with the Paris Agreement. This has occurred mainly through the implementation of federal policy instruments. Internally, few states have put in place and maintained updated

climate policy instruments such as special plans, strategies, inventories, or risks atlases, and some have even embarked on the implementation of carbon taxes. On the other hand, climate action in many states struggles with lack of political will, limited information, and limited capacities to define strategies, or mid-term and long-term objectives and goals. Although there is a National Climate Change System in place, more strategic and structured coordination could strengthen the efficiency and efficacy of federal, state, and municipal climate policy.

Mexico's highly centralised federalism has fostered the design and implementation of nation-wide climate instruments. However, there are gaps for a more appropriate regional and local climate action. The General Law on Climate Change assigns an important role to subnational governments; it does allow some flexibility to adapt this climate policy to their needs as well as for innovation. On the other hand, this statutory body does not recognise territorial differences, nor does it account for the differences in development and capacities among the different regions across the country. Furthermore, the federal government has not significantly integrated subnational actions in climate policymaking processes, such as in the definition of the 2015 and 2020 NDC objectives and goals, and in the allocation of federal funds for climate action. Being relatively aside from NDC design in 2015 and their update in 2020, it remains to be seen how subnational action could contribute to enhancing or raising national ambition. Currently, the progress required throughout the national territory to meet the mitigation and adaptation objectives established in the NDC is not clear.

Despite structural challenges, state responsibilities outlined by the General Law on Climate Change have favoured the emergence of experiences such as the one in the Yucatan peninsula, and by the state of Yucatan, by adopting a regional subnational initiative for the planning and implementation of a climate policy that provides a valuable space for exploiting its mitigation capacity and to identify and address its adaptation needs. Although this sort of initiative shows a gradual progress and enhances governance, several challenges remain in a highly centralised federalism that struggles to make welfare accessible to people and ecosystems across the nation.

### Notes

- 1 This is more widely reviewed and addressed in the Strategic evaluation on the Subnational Climate Change Policy Implementation performed by the Coordination of Evaluation and INECC (INECC, 2018a).
- 2 Mexico's federal system has been widely studied. See: Victoria Rodriguez. 1998. 'Recasting Federalism in Mexico'. *Publius* 28(1): 235–54.
- 3 Mexico was the second country to have a national climate change law, after the UK, and the Regulation of the Law was published on 28 October 2014.
- 4 Cf. notes 1, 4.
- 5 Notably Oxkintok, Uxmal, Kabah, Sayil, Labna, Xlapak, and Chacmultun.

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