

**Air Pollution Series**

# **Actions on Air Quality in Latin America and the Caribbean**

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**Executive Summary**

**UN**   
environment  
programme

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1972-2022

## Context

### **Air pollution is an environmental risk to human health and a major cause of preventable death and disease worldwide.**

Based on the World Health Organization (WHO) global assessment of exposure to ambient air pollution, 92 per cent of the world's population lives in places where air quality levels exceed the organization's air quality guideline for annual mean concentrations of particulate matter with a diameter of less than 2.5 micrometres (PM<sub>2.5</sub>) (Health Effects Institute 2020). In the Americas, more than 320,000 premature deaths are attributable to ambient air pollution (WHO 2016). The welfare cost of exposure to ambient and household air pollution, covering PM<sub>2.5</sub> and ozone, is estimated to total 2.4 per cent of gross domestic product (GDP) equivalent in Latin America and the Caribbean (LAC) (World Bank & Institute for Health Metrics and Evaluation 2016).

### **This regional report complements a global report and focuses on regional trends and priorities,**

along with five others (Africa, Asia and the Pacific, Europe and Central Asia, North America and West Asia). The global report provides a review of the policy actions carried out by member states in line with the provisions of the United Nations Environment Assembly Resolution 3/8 on Preventing and reducing air pollution to improve air quality globally. In addition, it builds on the 2016 United Nations Environment Programme (UNEP) report, "Actions on Air Quality", which gives an overview of the actions undertaken by countries around the world, with focus on a set of measures that, if adopted, would significantly improve air quality.

### **The analysis conducted in this regional report is based on data collected in 2020 through a detailed survey**

shared with the 33 countries in LAC. Responses were received from 20 countries<sup>1</sup>. Other reference documents were also consulted, including official publications of environmental institutions, publicly available official documents related to plans, programmes, strategies and regulations, and academic publications. For some indicators, there are comparisons between 2015 (baseline) and 2020 (this study), which allows progress on air quality policy action to be estimated in the 33 countries in the region. These indicators are the existence of ambient air quality standards, incentives for industry, vehicle emission standards, waste-burning regulations and household clean energy programmes. For comparison purposes, if a country did not report any changes in 2020 for any of the indicators, it is assumed that the indicator remains the same as in the previous assessment<sup>2</sup>.



Renewable Energy  
Photo credit: © AngelC

A **regional consultation** for the report was also conducted in March 2021 through the focal points of the LAC Intergovernmental Network on Atmospheric Pollution and other regional experts. The compilation and editing work has been carried out by the UNEP Latin America and the Caribbean Office between August 2020 and June 2021.

### **This summary provides an update on the progress made in adopting key measures to improve air quality in LAC countries,**

and a brief analysis of progress compared to the 2016 overview. The full report provides further details and offers an analysis of regional actions, including case studies and the measures implemented by different countries to reduce air pollutant emissions from different sectors. Some recommendations have also been identified to allow progress in the implementation of air quality actions in the region to continue.

## Status and trends

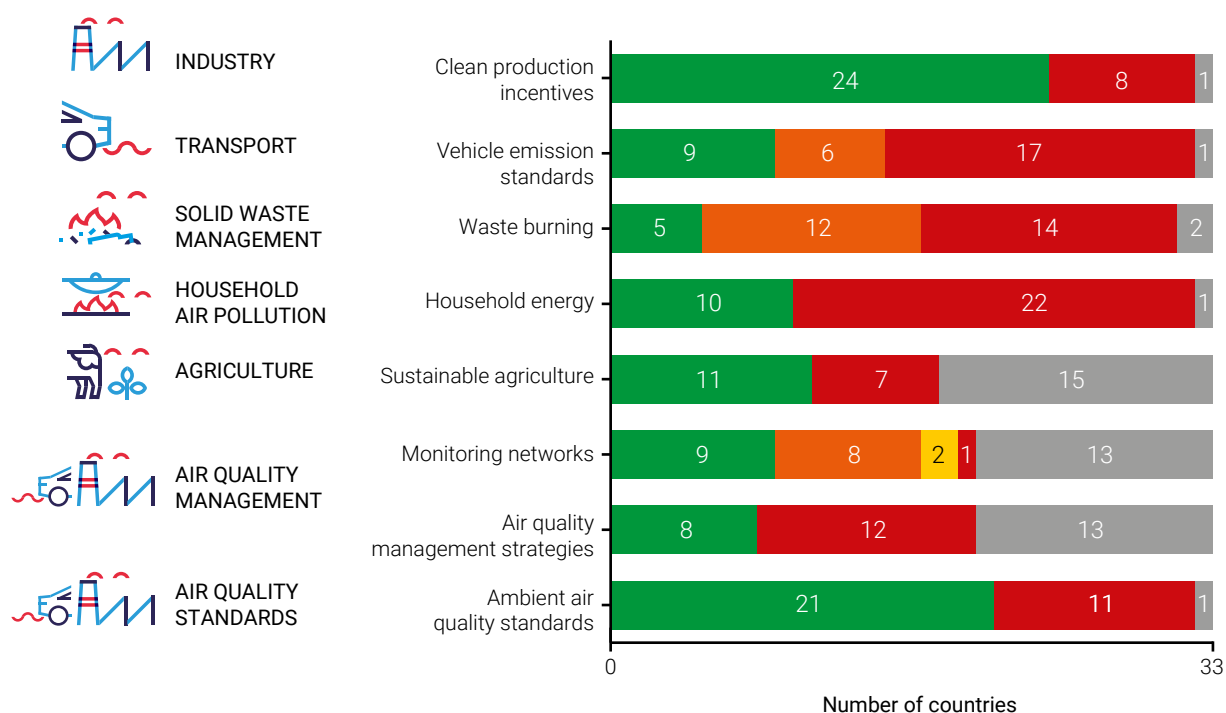
The report provides an overview of non-sectoral air quality management actions, including air quality frameworks, strategies, standards and monitoring. It also assesses the actions carried out in key sectors that contribute to air pollution in most countries, including industrial emissions, road transportation, solid waste management, household air pollution and emissions from agriculture. The number of LAC countries that have adopted key actions and policies that can significantly improve air quality is presented in Figure 1 on below, based on an analysis of UNEP data.

<sup>1</sup> 20 respondent governments: Argentina, Bahamas, Belize, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Peru, Suriname, Trinidad & Tobago, Uruguay and Venezuela.

<sup>2</sup> For example, if a country reported having air quality standards in 2015 and did not respond to the 2020 survey, it is assumed that these standards are still in place today.

## Figure 1. Progress towards adoption of key actions that can significantly improve air quality

### Where is the LAC region taking action in to improve air quality?



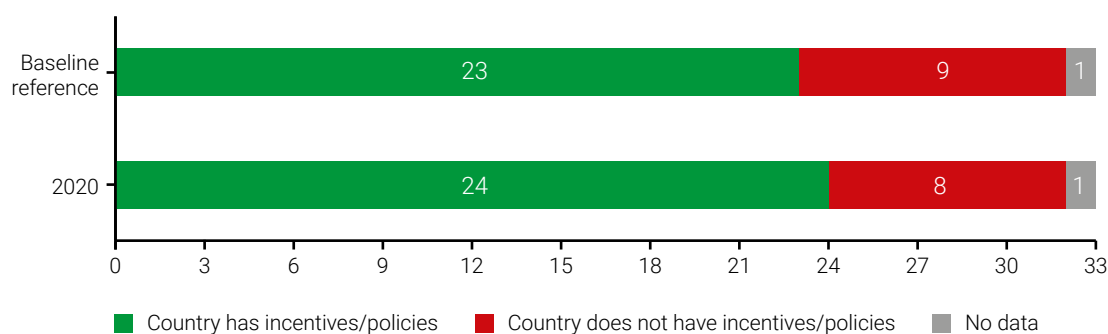
Source: UNEP survey data<sup>3</sup>

## Sectoral air quality management actions

The region has made slight progress in adopting incentives or policies promoting cleaner production, energy efficiency or pollution abatement for industries, in comparison with the baseline reference analysis of 2015. In addition, at least 12 countries have adopted national emission standards for industries that are contained in laws and regulations.

The measures adopted to reduce industrial emissions include the use of environmental impact assessments to regulate industries, industrial emission standards, and regulations and policies on efficient resource use (fuel and electricity). Box 1 details examples of some of these measures.

## Figure 2. Countries with incentives or policies promoting cleaner production, energy efficiency or pollution abatement for industries



Source: UNEP survey data

<sup>3</sup> From the analysis of UNEP data, a set of key policy actions were identified that, if adopted, would significantly improve air quality. The figure indicates how many countries have adopted these policies (green), are on their way to adopting them (orange/yellow) or have yet to adopt or implement them (red). Grey indicates that no data were available.



### Box 1: Examples of actions adopted by LAC countries to address industrial emissions

**Colombia** has adopted a *national policy for air quality improvement* through the CONPES 3943 document approved in 2018. The policy was developed with the participation of the Ministries of Environment, Energy, Health, Transport, Commerce and Industry in close coordination with the National Planning Department for the period 2018 to 2030. Furthermore, a *National Air Quality Strategy* has been developed by the Ministry of Environment for 2018–2022, and other national frameworks have also been drawn up, such as the National Strategy to Reduce Short-Lived Climate Pollutants and the National Circular Economy Strategy. Regulation exists in the country for some specific activities that require *emission permits or licences to be carried out*. Terms of reference for mining, hydrocarbon exploration, the thermal treatment of hazardous waste, etc., have been adopted by the country for the development of environmental impact assessments. In addition, sectoral guidelines for Best Available Techniques and Best Environmental Practices have been created to highlight good and cost-effective practices and promote the reduction of air pollutant emissions.

**El Salvador** has a number of different instruments in place, such as the *2010–2024 National Energy Policy*, with strategic guidance in promoting energy savings and a culture of energy efficiency. The country also has a methodology for energy efficiency for the industry, commerce and services sectors with the objective of applying *energy audits* in order to reduce electric and thermal energy consumption. Furthermore, *technical energy efficiency regulations* for labelling air conditioning equipment, refrigeration equipment and AC motors are in place and are expected to save more than USD 100 million over a ten-year period.

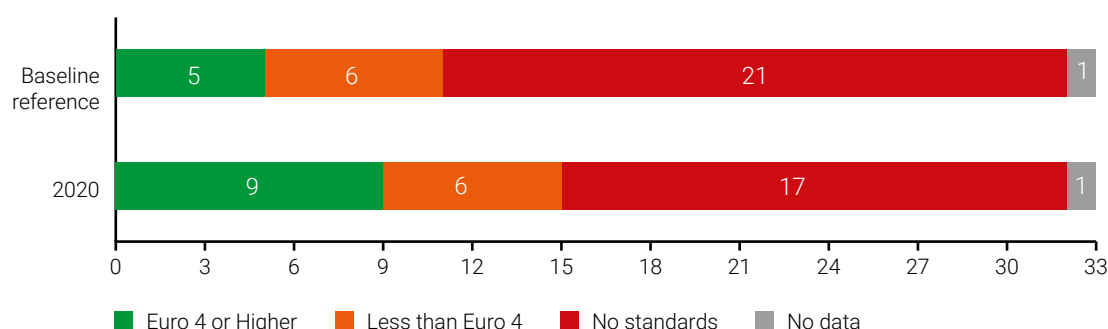
**Mexico** has developed a *National Environmental Audit Programme* that aims to promote inclusive and green growth that preserves natural heritage while generating wealth, competition and jobs. This programme recognizes the environmental performance and improvements of industrial activities, mainly the manufacturing and transformation industry. Two-year *environmental certificates* are awarded to activities that engage with environmental protection. More than 3,500 companies participate in the programme and over 17,500 certificates have been issued since it was created in 1992. This has resulted in more efficient processes, savings in water and energy consumption, and less waste being generated.

Mexico<sup>4</sup>

**Vehicle emission standards have been adopted by at least 15 LAC countries (45 per cent), which represents significant progress** compared to the baseline figure (11 countries). Some countries have also implemented regulations to limit the sulphur content of diesel and

petrol. This increase in regulations for the transport sector can be explained by the efforts focused on cities and metropolitan areas where transport is the main source of air pollution. However, no emission standards have been identified for about 50 per cent of countries.

**Figure 3. Countries meeting Euro 4/IV vehicle emission standard**



Source: UNEP survey data

<sup>4</sup> Mexico: National Environmental Audit Programme: <https://www.gob.mx/profepa/acciones-y-programas/programa-nacional-de-auditoria-ambiental-56432>

## Box 2: Examples of actions adopted by LAC countries to address transport emissions

**Chile** has strongly encouraged action towards *electromobility in public transport*, and aims for 100 per cent of public transport to be electric by 2040. In the Santiago Metropolitan Region, there are ten electroterminals and 770 electric buses, and other regions such as Temuco, Concepción and Antofagasta are also expected to move forward in this area. In addition, Chile has developed a tax scheme based on emissions and performance that is applicable to new light- and medium-duty vehicles.

In 2017, **El Salvador** adopted *Central American Technical Regulation (RTCA) 75.02.17:13* concerning diesel quality specifications that establishes 500 parts per million (ppm) as the maximum permissible limit for sulphur content. This regulation was also adopted by **Guatemala** and **Honduras** in 2015 and by **Nicaragua** in 2019. **Costa Rica** already had low-sulphur diesel by the time the regulation was adopted in 2014.

**Mexico City** has also strengthened actions to *promote sustainable mobility*. These actions include expanding public transport infrastructure such as metro lines, cable buses, trolley buses, cycle lanes and bike parking stations, and *upgrading transport technologies*, including new trolley buses, EURO VI buses and new metro carriages. Ten-year-old taxis have also been replaced by new electric vehicles or vehicles with a fuel economy higher than 15 kilometres per litre of fuel and NO<sub>x</sub> emissions lower than 0.068 grams per kilometre.

**Peru** has recently adopted a new regulation (Supreme Decree 005-2020-MTC) that only allows used *vehicles less than two years old to be imported*. The import of used vehicles that cannot comply with the maximum permissible limits of pollutant emissions required for new vehicles has also been banned. The objective of these measures is to upgrade the entire vehicle fleet and reduce air pollution. In the Lima Callao region, for example, transport is the main source of air pollution, contributing almost 57 per cent and 97 per cent of all PM<sub>2.5</sub> and black carbon emissions, respectively.

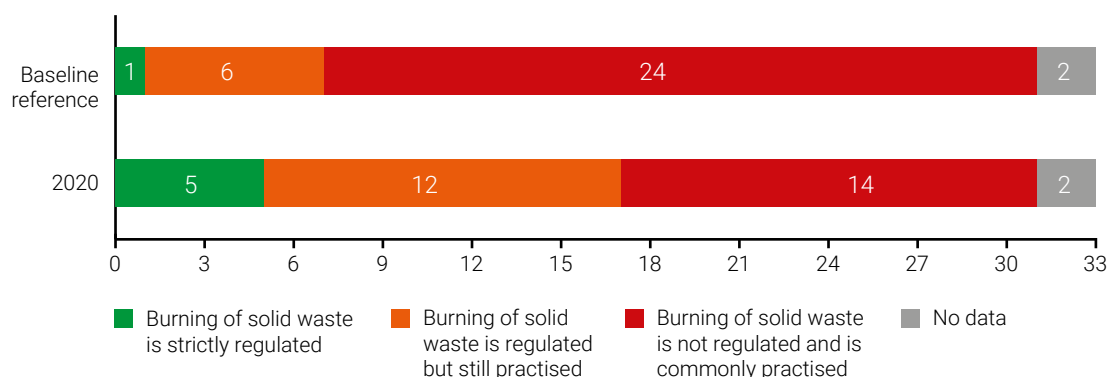
Chile<sup>5</sup>, Mexico<sup>6</sup>, Peru<sup>7</sup>

### The number of countries that have regulations for open waste burning has increased significantly since 2016.

Seventeen countries (10 more than in 2016) regulate

the burning of waste in some way, but only five of these do so strictly. Despite this progress, open burning is still practised in many countries, even where regulations exist.

**Figure 4. Countries with solid waste burning regulations**



Source: UNEP survey data

<sup>5</sup> Chile: <https://www.electromov.cl/2020/12/17/consorcio-liderado-por-la-universidad-de-chile-se-adjudica-desarrollo-de-primer-centro-para-la-electromovilidad-del-pais/>

<sup>6</sup> Mexico: Jefatura de la ciudad de México: <https://www.jefaturadegobierno.cdmx.gob.mx/storage/app/media/pdf-sustitucion-taxis.pdf>

<sup>7</sup> Peru: <https://busquedas.elperuano.pe/normaslegales/modifican-los-requisitos-minimos-de-calidad-para-la-importac-decreto-supremo-n-005-2020-mtc-1851548-7/>

### Box 3: Examples of actions undertaken by LAC countries to address emissions from solid waste

**Brazil** has recently launched a *zero waste programme* within the framework of the National Agenda of Urban Environmental Quality, which aims to address the issue of solid urban waste by strengthening the integrated management, selective collection, recycling, reverse logistics, energy recovery and environmentally sound disposal of final waste. As a successful case study, in 2018, the *Estrutural dump* in Brasilia was closed after more than 50 years of operation. It was the largest open dump in Latin America and the Caribbean, and waste was not separated, covered or compacted but was often simply burned. The *dump was replaced by recycling plants and a sanitary landfill* further away from the city. It is estimated that this measure will prevent at least 70 per cent of the 1.4 million metric tons of carbon dioxide equivalent (CO<sub>2</sub>-eq) that the landfill would have generated by 2050.

**Nicaragua** has developed national *technical regulations* for the management and final disposal of hazardous and non-hazardous waste, including pesticide residues and sites polluted with persistent organic pollutants, as well as electrical and electronic waste. The *La Chureca dump* in Managua was the largest open dump in Central America, having received more than 4 million cubic metres of waste during its lifetime. It began operating in 1971 and the waste disposed of there was never treated, and open burning was common. In 2016, the dump was *replaced by a modern landfill and a recycling plant* and local authorities also launched a social inclusion programme, which included the construction of houses for 258 families, new job opportunities and access to health services.

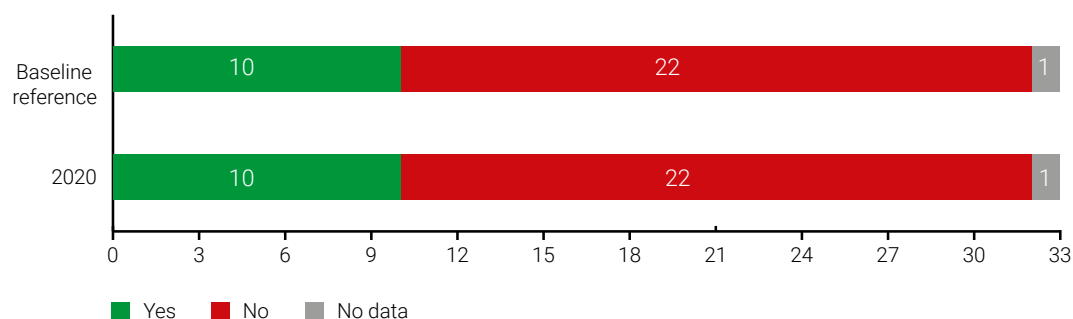
**Uruguay** has included some mitigation measures in its Nationally Determined Contribution concerning the waste sector. One of these measures is to **capture and burn methane in urban solid waste final disposal sites** (with or without power generation). The goal was for 60 per cent (unconditioned) and 90 per cent (conditioned) of the urban solid waste generated to be disposed of using this technology by 2025. By 2017, this goal had been 70 per cent achieved. The Nationally Determined Contribution includes goals that are affected by additional implementation means, such as financing, technology and development, as well as capacity-building provided to the country. Law 19.829/2019 regulates the final disposal of urban solid waste and establishes minimum conditions for the design, operation and closure of dumps. Other measures include the strengthening of recycling processes, other waste valorization alternatives and power generation within the framework of the country's national energy policy, which promotes the generation of power from renewable, non-traditional sources.

Brazil<sup>8</sup>, Nicaragua<sup>9</sup>, Uruguay<sup>10</sup>

About **40 per cent of countries in the region have developed programmes to promote the use of clean energy in households for cooking and heating**, the same figure as in the baseline year. The main fuels or

sources of energy used for cooking and heating in the region are propane/liquefied petroleum gas, wood, electricity, and to a lesser extent, coal/charcoal and natural gas.

**Figure 5. Countries with national clean residential energy programmes**



Source: UNEP survey data

<sup>8</sup> Brazil: <https://www.gov.br/mma/pt-br/assuntos/agendaambientalurbana/lixao-zero>

<sup>9</sup> Nicaragua: La Chureca: [https://www.aecid.es/galerias/noticias/descargas/2013/La\\_Transformacxn\\_del\\_Vertedero\\_de\\_La\\_Chureca.pdf](https://www.aecid.es/galerias/noticias/descargas/2013/La_Transformacxn_del_Vertedero_de_La_Chureca.pdf)

<sup>10</sup> Uruguay: <https://www.gub.uy/ministerio-ambiente/sites/ministerio-ambiente/files/2021-04/28-FT-Residuos%20SU.pdf>

#### Box 4: Examples of actions adopted by LAC countries to address emissions from the residential sector

**Chile** has promoted regulations on *thermal insulation* for new housing and the replacement of wood-based heating systems. It has also developed a national programme to replace *old household heating devices* with new ones that are more efficient and produce less pollution, whereby the government subsidizes part of the cost of the new device and the beneficiary covers the remaining cost in a type of co-payment scheme (University of Chile 2019).

**Haiti** has recently developed innovative training programmes on *wood pellet production and the construction of pyrolysis stoves*, as well as the production of *biomass pellets from agricultural waste* (sugar cane) as cleaner alternatives for cooking. Up to 2,000 kilograms of biomass can be transformed into valuable energy pellets each day, enough to meet the cooking needs of around 4,000 households. Wood and charcoal are still massively used for cooking, which has a severe detrimental effect on environment (deforestation) and household health. It is estimated that around 95 per cent of the population (equivalent to around 2.2 million households) uses these fuels in their homes.

**Honduras** has developed a national programme known as “Vida Mejor” [Better Life] to improve infrastructure in households, including the *replacement of traditional open-fire stoves* with more efficient “eco-stoves”. Firewood is one of the main fuels used for cooking in the country, representing up to 88 per cent of the fuel used in rural areas, which has led to a significant increase in deforestation over recent decades (Flores et al. 2020). Zamorano University hosts a laboratory that evaluates the performance of eco-stoves. The country has also recently developed a technical regulation that covers performance criteria such as indoor emissions, wood consumption, total emissions, energy efficiency and safety for users.

**Uruguay** has developed a *National Energy Efficiency Plan 2015–2024* that contains measures around household heating. In Uruguay, 54 per cent of households use wood for heating with open devices that have an impact on health and air quality. The objective of this plan is to ensure that 25 per cent of households use high-performance and efficient devices. In 2020, Uruguay *promoted household heating best practices through a campaign aimed at the population*, which covered the type of wood to use for better combustion, how to maintain dry wood at home and how to clean heating devices.

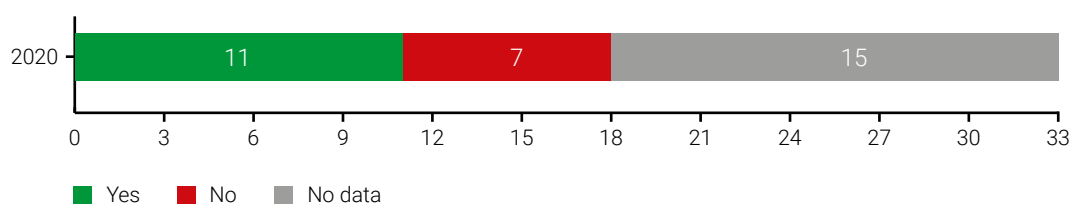
Haiti<sup>11</sup>, Honduras<sup>12</sup>

#### Eleven countries have reported that they have incentives in place to promote sustainable agriculture.

Measures include alternatives to the open burning

of agricultural residues, improved livestock manure management, and the reduction of food waste through composting.

**Figure 6. Countries with incentives promoting sustainable agriculture practices (such as livestock manure management and use of organic fertilizers)**



Source: UNEP survey data

<sup>11</sup> Haiti: USAID Fuel for Change: <https://www.youtube.com/watch?v=ZFEIGarTgo4>  
Sauver les forêts d’Haïti – un fourneau à la fois [Saving Haiti’s forests, one stove at a time], The Global Climate Change Alliance Plus Initiative: <https://www.gcca.eu/fr/stories/sauver-les-forets-dhaiti-un-fourneau-la-fois>

<sup>12</sup> Honduras: Lanzamiento de norma nacional de estufas mejoradas [The launch of national regulations for better stoves], Zamorano University: <https://www.zamorano.edu/ceem/lanzamiento-de-norma-nacional-de-estufas-mejoradas/>

## Box 5: Examples of actions adopted by LAC countries to address emissions from the agricultural sector

**Brazil** has developed a *National Low-Carbon Agriculture Plan*, which aims to increase the area where sustainable production systems are used in order to reduce greenhouse gas emissions. This plan encourages farmers to adopt a set of technologies aimed at increasing productivity, profitability, and the resilience and adaptive capacity of national agricultural systems, with the integration of soil, water and biodiversity conservation strategies. It includes, among other complementary actions, an estimated reduction in greenhouse gas emissions as follows: restoration of grazing land (83–104 million tCO<sub>2</sub>e by 2020), integrated crop-livestock systems (18–22 million tCO<sub>2</sub>e by 2020), no-till farming (16–20 million tCO<sub>2</sub>e by 2020) and biological nitrogen fixation (16–20 million tCO<sub>2</sub>e by 2020).

**Costa Rica** is implementing a *Low-Carbon Coffee Nationally Appropriate Mitigation Action* that offers technical and policy advice on changing production and processing practices in the sector. More than 60 coffee mills have been supported to identify areas for mitigation improvements in their processes and equipment, and 40 of these mills have already implemented them. More than 7,000 coffee farmers have been trained in *Good Agricultural Practices*, with at least two implemented on their farms, representing more than 20 per cent of all coffee farmers in the country. The aggregate emission reduction potential amounts to 1.85 million tCO<sub>2</sub>e over 20 years. Moreover, the country has led the Ecological Blue Flag Program, which aims to promote the implementation of climate change mitigation actions.

**Nicaragua** has created incentives for the use of *biodigesters fed by livestock waste*. The Nicaraguan Institute of Agricultural Technology promotes the use of alternative fertilizers derived from compost (food waste) and natural herbicides. The Ministry of Environment and Natural Resources has implemented projects for the restoration of natural areas, including the promotion of agroforestry and silvicultural systems that help to mitigate greenhouse gas emissions through forest recovery.

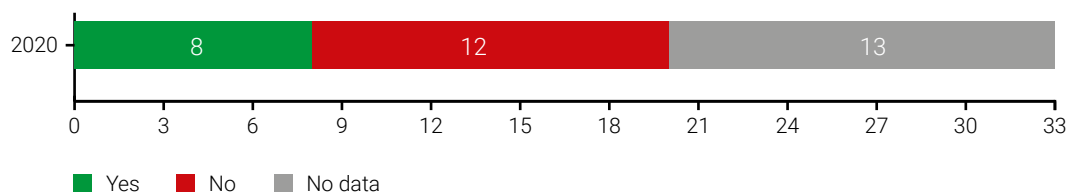
Costa Rica<sup>13</sup>

## Non-sectoral air quality management actions

**At least eight countries in the region have a national air quality management strategy, framework or action plan (40 per cent of respondent countries).** These air quality strategies are generally implemented through a national action plan, although some countries also report implementing them through sectoral plans or clean air laws.

**In 2020, 21 LAC countries (or about two thirds) were found to have legal instruments containing ambient air quality standards** taking into account the interim targets or guidelines established by WHO for certain criteria air pollutants — an increase of two countries from the baseline. Some other countries are in the process of reviewing or updating these standards or have plans to introduce standards in legislation soon.

**Figure 7. Number of countries with a national air quality management strategy, framework or action plan**

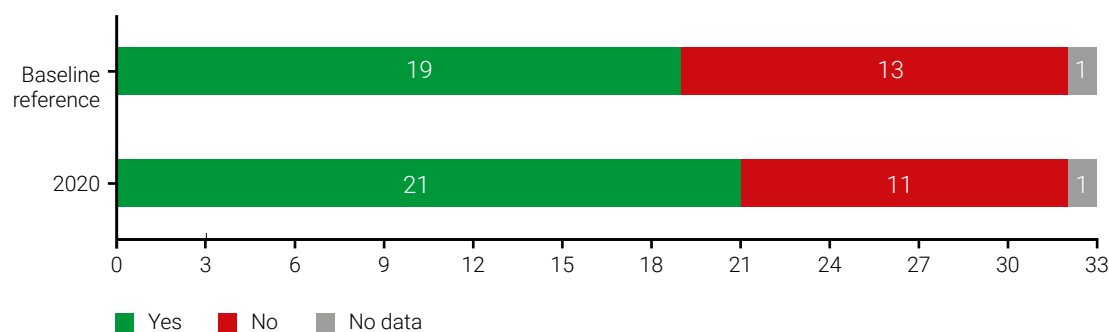


Source: UNEP survey data

<sup>13</sup> Costa Rica: <http://www.banderaazulecologica.org/que-es-bae>

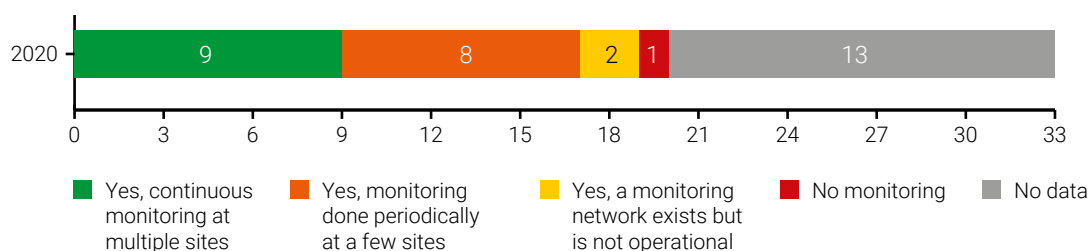


**Figure 8. Countries with ambient air quality standards embedded within a legal instruments**



Source: UNEP survey data

**Figure 9. Countries with national ambient air quality monitoring networks**



Source: UNEP survey data

**Although air quality monitoring has been strengthened, further investment is required to monitor air quality for regulatory and health assessment purposes.** At

least 17 countries have deployed some kind of air quality monitoring network, whether periodic or continuous. However, air quality monitoring in the region must be strengthened in order to expand coverage to other areas/ places and provide a better picture of the air pollution issue.



Green traffic lights for bicycles in the city. Green light for sports concept. Healthy living and sustainable transportation for healthier life, clean planet and reduction of carbon emission.  
Photo credit: © Boumen Japet

#### Box 6: Trinidad & Tobago strengthens its air quality policy framework and monitoring network

Trinidad and Tobago has a population of around 1,363,985 (2019 estimate) and is the most industrialized economy in the English-speaking Caribbean, with an important oil and gas sector. The country recently joined the BreatheLife campaign and is committed to ensuring safe air for its citizens by updating its air quality standard for  $PM_{2.5}$  through the amendment of the Air Pollution Rules legislation established in 2014. With this amendment, the country aims to reduce the 24-hour concentration standard for  $PM_{2.5}$  from  $65 \mu\text{g}/\text{m}^3$  to  $35 \mu\text{g}/\text{m}^3$  by the end of 2025, thereby achieving the WHO ambient air quality guideline value for Interim Target 3.

In addition, the Environmental Management Authority launched a National Ambient Air Quality Monitoring Network in 2016, with which it plans to expand its system of ambient air quality monitoring stations from three to five by the end of 2021. Air quality data management software is used to remotely link all stations, compile the data into an inventory system, perform data validation and calculate an Air Quality Index that can be disseminated to the public in real-time through a website, graphically displaying the connection between air quality and health. The public version of the AQI website was launched in February 2019.

## Conclusions

As a general overview, the Latin America and Caribbean region has made some progress in developing regulations, policies and frameworks to monitor air pollution, adopting ambient air quality standards and reducing emissions from different key sources. Nevertheless, there are still countries and mid-sized cities experiencing expansion and urban growth that do not have yet a framework to prevent and reduce air pollution or the capacity to implement and enforce existing plans and regulations. The development of a national or subnational air quality strategy, action plan or framework requires the participation and involvement of key stakeholders from different areas including the environment, health, energy, transport, industry and agriculture, as well as the private and academic sectors. The formation of suitable strategies is hampered in some countries by the lack of data evidence from air quality monitoring, emissions inventories or source apportionments, or where health impacts and the associated costs are not estimated.

Several experiences, case studies, best practices, etc., have also been identified and compiled in the report. There is significant potential for information and knowledge to be exchanged in the region, which can be enhanced through the Intergovernmental Network on Air Pollution of Latin America and the Caribbean, in collaboration with different partners and stakeholders. The air quality agenda in the region will continue to move forward within the framework of the United Nations Environment Assembly (UNEA) Resolutions, the Sustainable Development Goals, decisions made by the Forum of Ministers of Environment of Latin America and the Caribbean and other relevant international actions such as the BreatheLife campaign and the International Day of Clean Air for blue skies to raise awareness and build capacity in the region to strengthen the comprehensive management of air quality.



CUNHA, SAO PAULO / BRAZIL - AUG 16, 2019: Plastic waste containers used to segregate metals, papers, plastic and glass materials for recycling at the fencing of the viewing spot of O Lavandario farm.  
Photo credit: © Shutterstock/ Deni Williams



