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**Promotion and protection of all human rights, civil,  
political, economic, social and cultural rights,  
including the right to development**

## **Issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment**

### **Report of the Special Rapporteur**

#### *Summary*

In the present report, the Special Rapporteur recalls that the right to a healthy environment has been recognized by a majority of States in their constitutions, legislation, and various regional treaties to which they are parties. However, in spite of the wide recognition of its crucial importance, the right to a healthy environment has not yet been recognized as such at the global level. The Special Rapporteur focuses on the right to breathe clean air as one of its component and describes the negative impact of air pollution on the enjoyment of many human rights, in particular the right to life and the right to health, in particular by vulnerable groups. He highlights the different State obligations in relation to the right to breathe clean air, which are both procedural and substantive, as well as the specific obligation to protect people and groups in vulnerable situations. He identifies several good practices implemented worldwide that have helped to improve air quality. Finally, the Special Rapporteur offers a number of recommendations to States for actions they should consider as part of a national air quality action plan and urges businesses, in order to fulfil their responsibility in this regard, to contribute to and support efforts to reduce air pollution.



## I. Introduction

1. In its resolution 19/10, the Human Rights Council recognized that the human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment required clarification. The Council appointed John H. Knox as Independent Expert to study the obligations and to identify related best practices. The Independent Expert prepared two reports for the Council, mapping the statements of human rights bodies on human rights obligations relating to the environment (A/HRC/25/53) and describing more than 100 good practices in fulfilling the obligations (A/HRC/28/61).

2. In its resolution 28/11, the Council extended the mandate of the mandate holder as Special Rapporteur. Mr. Knox produced thematic reports addressing human rights obligations related to climate change (A/HRC/31/52), biodiversity (A/HRC/34/49) and children's rights and the environment (A/HRC/37/58). In 2018, he presented to the Council framework principles on human rights and the environment (A/HRC/37/59, annex), the main human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment.

3. In its resolution 37/8, the Council renewed the mandate for a further three years. David R. Boyd was appointed as the new Special Rapporteur on 1 August 2018.

4. On 25 October 2018, Mr. Boyd presented his thematic report on the global recognition of the right to a safe, clean, healthy and sustainable environment (A/73/188) to the General Assembly, written jointly with Mr. Knox. He organized an expert consultation on human rights and environmental challenges in New York on 22 and 23 October 2018, in cooperation with SwedBio, Terre des hommes and the United Nations Environment Programme (UNEP). The Special Rapporteur participated in the First Global Conference on Air Pollution and Health, convened by the World Health Organization (WHO) in Geneva from 30 October to 1 November 2018. From 7 to 18 December 2018, the Special Rapporteur undertook a country visit to Fiji. A separate report will highlight his findings and recommendations.

5. To prepare the present report, the Special Rapporteur organized a public consultation with States, international organizations and other relevant stakeholders in Geneva on 29 October 2018. He also held a consultation with civil society representatives on 31 October 2018. These consultations complemented the call for inputs on air pollution and human rights circulated to all Member States on 27 September 2018, as well as to civil society organizations, private actors and academics.

6. In its resolution 37/8 the Council noted that more than 100 States had recognized some form of a right to a healthy environment in, *inter alia*, international agreements, their constitutions, legislation or policies. The Special Rapporteur would like to clarify the extent to which States are clearly obligated to respect, protect and fulfil the right to a healthy environment because of binding international treaties, constitutions and national environmental legislation. All of the following information is current as of 1 December 2018.

7. The African Charter on Human and Peoples' Rights of 1981 provides that "all peoples shall have the right to a general satisfactory environment favourable to their development" (art. 24). There are 53 States parties to the African Charter.

8. The 1988 Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights (Protocol of San Salvador) states that "everyone shall have the right to live in a healthy environment" (art. 11 (1)). There are 16 States parties to the Protocol of San Salvador.

9. The Arab Charter on Human Rights of 2004 includes the right to a healthy environment as part of the right to an adequate standard of living that ensures well-being and a decent life (art. 38). There are 13 States parties to the Arab Charter.

10. The 1998 Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) refers to "the

right of every person of present and future generations to live in an environment adequate to his or her health and well-being" (art. 1). There are 46 States parties to the Aarhus Convention (plus the European Union).

11. In total, 124 States are parties to legally binding international treaties that explicitly include the right to a healthy environment.<sup>1</sup>

12. In September 2018, the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú Agreement) opened for signature. The agreement requires that "each Party shall guarantee the right of every person to live in a healthy environment" (art. 4). Sixteen States have signed the Escazú Agreement, but it is not yet in force. The Human Rights Declaration adopted by the 10 States in the Association of Southeast Asian Nations in 2012 incorporates the "right to a safe, clean and sustainable environment" as an element of the right to an adequate standard of living (para. 28 (f)), but is not legally binding.

13. There are 100 States whose constitutions explicitly incorporate the right to a healthy environment, using a variety of phrases used to describe this right. For example, the Constitution of Costa Rica states: "All persons have the right to a healthy and ecologically balanced environment" (art. 50). The Constitution of Fiji states: "Every person has the right to a clean and healthy environment, which includes the right to have the natural world protected for the benefit of present and future generations through legislative and other measures" (art. 40 (1)).

14. There are at least 12 additional countries where courts have ruled that the right to a healthy environment is an essential element of the right to life (e.g. India, Ireland, Nigeria and Pakistan) and therefore is an enforceable, constitutionally protected right.<sup>2</sup>

15. There are more than 100 States where the right to a healthy environment is explicitly incorporated in national environmental legislation.

16. In total, at least 155 States are legally obligated, through treaties, constitutions, and legislation, to respect, protect, and fulfil the right to a healthy environment. This provides a compelling basis for the United Nations to move expeditiously to provide global recognition of the right to a healthy and sustainable environment, as recommended by both the previous and current Special Rapporteurs on human rights and the environment.

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<sup>1</sup> The total number of parties to the African Charter, the Aarhus Convention, the Protocol of San Salvador and the Arab Charter is 128. (The United Kingdom of Great Britain and Northern Ireland has made a reservation to the Aarhus Convention; the State of Palestine has the status of "non-member observer State" at the United Nations; and Algeria and Libya are parties to both the Arab Charter and the African Charter, bringing the total to 124.)

<sup>2</sup> D.R. Boyd, "The implicit constitutional right to a healthy environment", *Review of European Community and International Environmental Law*, vol. 20, No. 2 (July 2011) pp. 171–179.

### Right to a healthy environment



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States in grey recognize the right to a healthy environment in their constitutions, legislation, as parties to a regional treaty, or a combination of these instruments.

*The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Republic of the Sudan and the Republic of South Sudan has not yet been determined.*

### Right to breathe clean air

17. The remainder of the present report examines the human rights obligations relating to the right to breathe clean air, which is one of the vital elements of the right to a healthy and sustainable environment, along with access to clean water and adequate sanitation, healthy and sustainable food, a safe climate, and healthy biodiversity and ecosystems. The report draws on information provided in more than 30 submissions received in response to a call for inputs from States, civil society organizations, private actors and academic as well as statements and reports by international organizations, human rights treaty bodies, special procedures and other sources.

## II. Adverse impacts of poor air quality

### A. Ambient and household air pollution

18. Air quality is degraded by both ambient and household air pollution. Ambient air pollution is caused by electricity generation (from burning fossil fuels or biomass), industrial processes (e.g. oil refining, brick and cement manufacturing), mining, agricultural practices (e.g. burning crop residues or to clear land), poor waste management (e.g. open burning of garbage) and transportation (land, water, air). Civil society organizations raised concerns about open burning of waste in Lebanon, bauxite mining in Guinea and coal mining in Mozambique. Small-scale businesses in the informal economy can cumulatively produce large volumes of air pollution. Natural factors, such as wildfires and dust storms, also can contribute to ambient air pollution. Household air pollution is generated by the use

of solid fuels (e.g. wood, dung, crop residues, coal) for cooking and heating within the home, as well as by burning kerosene for lighting.

19. The primary sources of air pollution vary between and within States. The relative importance of ambient and household air pollution varies depending on the level of wealth and availability of resources. There are significant interactions between the two categories of air pollution, as burning solid fuels indoors pollutes outdoor air. For example, in India, more than 25 per cent of ambient air pollution is from household sources.<sup>3</sup> The adverse health effects of air pollution are highest in low- and middle-income countries where exposures to both ambient and household air pollution are high.

20. Thousands of chemicals can have negative impacts on air quality. The substances that have been the primary focus of abatement efforts to date because of their known adverse health effects are particulate matter (PM), sulphur dioxide, nitrogen oxides, carbon monoxide, ozone and lead. Among the many other air pollutants of concern are benzene, polycyclic aromatic hydrocarbons, dioxins and furans, and mercury.

21. A group of pollutants that must be targeted with great urgency because of their substantial negative impacts on climate change and air quality are called short-lived climate pollutants and include black carbon, methane and tropospheric ozone.

22. Fulfilling the right to breathe clean air will require action at the household, local, national, regional and international levels. In some States, a significant portion of ambient air pollution is transboundary, meaning the source originates in another country or countries. Prominent examples include sand dust from the Sahara and Gobi deserts, haze from agricultural burning in South-East Asia and forest fires.

## B. Impacts on human health

23. Exposure to air pollution causes a wide range of health effects including respiratory illness and infections, heart disease, stroke, lung cancer and negative birth outcomes (e.g. pre-term birth and low birth weight). A growing body of evidence links air pollution to other health problems including cataracts, ear infections, the onset of asthma in children, chronic deficits in lung function, stunting, diabetes, childhood obesity, developmental delays, reduced intelligence and neurological disorders afflicting both children and adults.<sup>4</sup>

24. Fine particulate air pollution is the single largest environmental risk to health worldwide. Consisting of tiny particles that are breathed into the lungs and then pass into the bloodstream, fine particulate matter contains a toxic mixture of soot, black carbon, sulphates, nitrates and heavy metals, varying from place to place depending on the sources.<sup>5</sup>

25. More than 90 per cent of the world's population lives in regions that exceed WHO guidelines for healthy ambient air quality, specifically with respect to fine particulate matter, or PM<sub>2.5</sub>. In other words, over 6 billion people – including 2 billion children – are breathing air that has adverse consequences for their health and well-being.<sup>6</sup>

26. Together, ambient and household air pollution contribute to 7 million premature deaths annually, including the deaths of approximately 600,000 children.<sup>7</sup> This staggering death toll includes more than 2 million people in South and South-East Asia, more than 2 million people in the Western Pacific region (including China), almost 1 million people in Africa, more than half a million in Europe, almost half a million in the Eastern Mediterranean and more than 300,000 in the Americas. Emerging evidence about air

<sup>3</sup> World Health Organization (WHO), *Burning Opportunity: Clean Household Energy for Health, Sustainable Development, and Wellbeing of Women and Children* (Geneva, 2016).

<sup>4</sup> WHO, *Inheriting a Sustainable World? Atlas on Children's Health and the Environment* (2017).

<sup>5</sup> WHO, "Ambient (outdoor) air quality and health", fact sheet, May 2018.

<sup>6</sup> WHO, *Air Pollution and Child Health: Prescribing Clean Air*, advance copy, 2018.

<sup>7</sup> WHO, "Burden of disease from the joint effects of household and ambient air pollution for 2016", May 2018.

pollution and health indicates these may be underestimates.<sup>8</sup> Dependence on solid fuels, kerosene and polluting cookstoves causes more premature deaths than HIV/AIDS, malaria and tuberculosis combined.<sup>9</sup>

27. In addition, poor air quality inflicts extensive harm on workers every year, an issue that was covered in depth in a recent report by the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes (A/HRC/39/48 and Corr.1), and thus will not be further covered in the present report.

28. Hundreds of millions of people suffer from illnesses caused by poor air quality. Non-communicable diseases such as stroke, heart disease, chronic obstructive pulmonary disease and cancer have surpassed infectious diseases as the leading causes of death in the world. Air pollution is one of the five leading risk factors for non-communicable diseases globally.

29. Approximately 3 billion people continue to be exposed to household air pollution caused by burning solid fuels for cooking and heating. This includes people in Africa, South and South-East Asia and Latin America. Almost 1 billion people still rely on kerosene lamps and other polluting devices to light their homes. In poorly ventilated dwellings, levels of particulate matter can be more than 100 times acceptable levels.<sup>10</sup> The result is millions of preventable deaths caused by people breathing polluted air in the supposed safety of their own homes.

30. A study published in 2016 by the World Bank estimated that the global costs of air pollution exceed \$5 trillion per year.<sup>11</sup> Unless effective solutions are implemented immediately, the shocking statistics in the present report could grow even worse, as mortality caused by air pollution could increase by 50–100 per cent by 2050.<sup>12</sup>

### C. Impacts on vulnerable populations

31. Air pollution affects everyone, causing widespread violations of the right to breathe clean air. Yet the burden of related disease has a disproportionate impact on certain vulnerable populations. Among the most severely harmed are women, children, the elderly, minorities, indigenous peoples and members of traditional communities, people living in poverty, people with pre-existing health conditions such as respiratory conditions or heart disease and people who fall into several of these categories.

32. Women can be vulnerable to air pollution in particular situations. In States where household air pollution is prevalent, women suffer the highest levels of exposure because of their primary role in cooking. Women and girls often spend many hours each week gathering fuel for cooking and heating, which deprives them of educational and economic opportunities and raises the risks of injury and violence.<sup>13</sup>

33. Children are uniquely vulnerable to the adverse impacts of poor air quality due to physiological, behavioural and environmental factors.<sup>14</sup> Their developing brains and bodies are exquisitely sensitive to toxic substances and they have longer life expectancy, so that

<sup>8</sup> R. Burnett and others, “Global estimates of mortality associated with long-term exposure to outdoor fine particulate matter”, *Proceedings of the National Academy of Sciences*, vol. 115, No. 38 (18 September 2018), pp. 9592–597.

<sup>9</sup> World Bank, *The State of the Global Clean and Improved Cooking Sector*, Energy Sector Management Assistance Program Technical Report 007/15 (Washington, D.C., 2015).

<sup>10</sup> WHO, *Burning Opportunity*.

<sup>11</sup> World Bank and Institute for Health Metrics and Evaluation, *The Cost of Air Pollution: Strengthening the Economic Case for Action* (Washington, D.C., 2016).

<sup>12</sup> Organization for Economic Cooperation and Development, *OECD Environmental Outlook to 2050: The Consequences of Inaction* (Paris, 2012), pp. 275–278.

<sup>13</sup> WHO, *Burning Opportunity*.

<sup>14</sup> United Nations Children’s Fund (UNICEF), *Clear the Air for Children: The Impact of Air Pollution on Children* (New York, 2016); WHO, *Don’t Pollute My Future! The Impact of the Environment on Children’s Health* (2017).

childhood exposure can have lifelong health consequences. Air pollution is the leading risk factor for acute lower respiratory tract infections (e.g. pneumonia) in children under 5.<sup>15</sup>

34. The elderly in low- and middle-income countries are hit hard by air pollution. Of the total number of healthy years of life lost (disability adjusted life years, or DALY) due to air pollution, one quarter are lost by those over 70 years old. This problem is worsening as the global population ages.

35. Air pollution disproportionately harms poor people and poor communities. The overwhelming majority of illnesses and premature deaths caused by air pollution affect people in low- and middle-income countries. Poverty forces people to use polluting fuels and devices for cooking. Major sources of ambient air pollution, including power plants, factories, incinerators and busy roads, are often located in poor communities. Air pollution plagues low-quality housing, informal or temporary settlements and refugee camps. Poverty also exacerbates the impacts of air pollution through lack of access to information, health care and other resources.

36. As well as environmental injustices within nations, there are widening disparities in air quality between nations. Since 1990, wealthy, less-polluted countries (e.g. Japan, the United States of America and members of the European Union) have seen improvements in air quality while air quality has worsened in some heavily polluted countries (e.g. Bangladesh, India and Pakistan). A recent study estimated that 22 per cent of premature deaths caused by air pollution were linked to international trade, i.e. production of goods destined for export from low- and middle-income nations to wealthy nations.<sup>16</sup> For example, air pollution caused by producing goods for consumption in Western Europe and the United States is linked to over 100,000 premature deaths annually in China.

#### **D. Impacts on agriculture, biodiversity and ecosystems**

37. Some air pollutants have damaging impacts on agricultural productivity. It is estimated that 79–121 million tonnes of crops are lost annually due to ground-level ozone, leading to potential violations of the right to food.<sup>17</sup>

38. Air pollution has negative impacts on biological diversity and ecosystems. Various air pollutants cause or contribute to acidification of lakes, eutrophication of estuaries and coastal waters and mercury bioaccumulation in aquatic food webs. Terrestrial ecosystems are also damaged by air pollutants, including forests, grasslands and soils. For example, acid rain damages forests. Exposure to ozone lowers the rate of photosynthesis in many plants. Wildlife, from birds to amphibians, also are harmed by air pollution.

#### **E. Relationship between air pollution and climate change**

39. Greenhouse gas emissions are also a form of air pollution. As the previous mandate holder explained, States have obligations under human rights law to reduce their emissions of greenhouse gases and take steps to adapt to climate change (A/HRC/31/52). States are falling far short of the goals they need to meet to avoid catastrophic consequences.<sup>18</sup>

40. To a significant extent, many of the same activities that harm air quality also contribute to climate change (A/HRC/32/23, para. 14). This includes combustion in the electricity, industrial, transportation and waste sectors, livestock production and the use of solid fuels for cooking and heating.

<sup>15</sup> WHO, *Air Pollution and Child Health*.

<sup>16</sup> Q. Zhang and others, “Transboundary health impacts of transported global air pollution and international trade”, *Nature*, vol. 543, No. 7647 (30 March 2017), pp. 705–709.

<sup>17</sup> F. Sun, D. Yun and X. Yu, “Air pollution, food production and food security: a review from the perspective of food system”, *Journal of Integrative Agriculture*, vol. 16., No. 12 (December 2017), pp. 2945–2962.

<sup>18</sup> United Nations Environment Programme (UNEP), *Emissions Gap Report 2018* (Nairobi, 2018).

41. Black carbon is formed by incomplete combustion of fossil fuels, biofuels and biomass. It is a significant source of particulate matter and also contributes to climate change. In addition, when deposited on snow and ice (e.g. snowfields and glaciers), black carbon accelerates melting, contributing to natural disasters and water insecurity. This is a significant problem in mountain regions, such as the Andes and the Himalayas.

42. The overlap between air pollution and climate change has a silver lining. Well-designed laws, standards, policies and programmes can simultaneously reduce the emissions contributing to air pollution and climate change, producing a double dividend.<sup>19</sup> Improving air quality produces largely short-term and local benefits, whereas the positive effects of climate mitigation are long-term and global. Overall, the economic benefits are substantially larger than the costs of reducing emissions.<sup>20</sup> However, in some countries lack of capacity, inadequate human and financial resources, poor governance and weak rule of law are obstacles to implementing known solutions.

43. It is imperative that air quality solutions be implemented in systemic fashion, integrated with climate policy and the Sustainable Development Goals. For example, mistakes were made in earlier efforts to address climate change without adequately considering air quality. In a number of European countries, economic incentives encouraged the purchase of diesel vehicles in an effort to reduce carbon dioxide emissions. However, the climate mitigation benefits were outweighed by an increase in nitrogen oxides and particulate matter, resulting in an increase in premature deaths and preventable illnesses.<sup>21</sup>

### III. Effects of air pollution on the enjoyment of human rights

44. Poor air quality has implications for a wide range of human rights, including the rights to life, health, water, food, housing and an adequate standard of living. Air pollution also clearly violates the right to a healthy and sustainable environment. While the General Assembly has adopted numerous resolutions on the right to clean water, it has never adopted a resolution on the right to clean air. Surely if there is a human right to clean water, there must be a human right to clean air. Both are essential to life, health, dignity and well-being. The United Nations High Commissioner for Human Rights stated at the First Global Conference on Air Pollution and Health, held in 2018, that “there can be no doubt that all human beings are entitled to breathe clean air”.

45. Obligations related to clean air are implicit in a number of international human rights instruments, including the Universal Declaration of Human Rights (right to adequate standard of living), the International Covenant on Civil and Political Rights (right to life) and the International Covenant on Economic, Social, and Cultural Rights (right to health). Damage to crops inflicted by air pollution threatens the right to food, while contamination of aquatic ecosystems by airborne contaminants (e.g. mercury) jeopardizes both the right to food and the right to water.

46. In 2000, the Committee on Economic, Social and Cultural Rights called on States to formulate national policies with the objective of reducing and eliminating air pollution.<sup>22</sup> The High Commissioner for Human Rights (A/HRC/19/34 and Corr.1) and the Human Rights Council (resolution 35/24) have stressed the importance of addressing air pollution. The impacts of air pollution on human rights have been acknowledged repeatedly as part of

<sup>19</sup> V. Ramanathan and others, *Well Under 2 Degrees Celsius: Fast Action Policies to Protect People and the Planet from Extreme Climate Change*, report of the Committee to Prevent Extreme Climate Change (2017).

<sup>20</sup> D. Shindell and others, “Quantified, localized health benefits of accelerated carbon dioxide emissions reductions”, *Nature Climate Change*, vol. 8, No. 4 (April 2018), pp. 291–295.

<sup>21</sup> E. Mazzi and H. Dowlatabadi, “Air quality impacts of climate mitigation: UK policy and passenger vehicle choice”, *Environmental Science and Technology*, vol. 41, No. 2 (15 January 2007), pp. 387–392.

<sup>22</sup> General comment No. 14 (2000) on the right to the highest attainable standard of health.

the universal periodic review process.<sup>23</sup> The New Urban Agenda developed at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) and endorsed by the General Assembly (resolution 71/256, annex) contains extensive references to the interrelated imperatives of respecting human rights and improving both ambient and household air quality.

47. Special procedures of the Human Rights Council have urged States to tackle the scourge of air pollution. In a report on children's rights and the environment (A/HRC/37/58), the mandate holder emphasized the need to reduce the catastrophic health impacts of air pollution. In 2016, the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes decried the "silent pandemic" of disease associated with childhood exposure to toxic substances, including air pollution (A/HRC/33/41). In 2018, the Independent Expert on the enjoyment of all human rights by older persons called upon States to reduce air pollution because it "disproportionately affects the health of older persons" (A/HRC/39/50). Special rapporteurs have also produced country reports highlighting the importance of tackling air pollution (A/HRC/30/40/Add.1 and Corr.1, A/HRC/37/58/Add.2).

48. Human rights are a vital element of the Sustainable Development Goals and improving air quality is essential to achieving several targets within the Goals, including target 3.9 on reducing deaths and illnesses from pollution; targets 7.1 on universal access to modern energy services and 7.2 on increasing the use of renewable energy; target 11.6 on reducing the per capita environmental impact of cities; and target 12.4 on environmentally sound management of chemicals and wastes.

49. Improving air quality would also benefit human rights related to other Sustainable Development Goals, including Goal 1 on no poverty; Goal 5 on gender equality; Goal 6 on clean water and sanitation; Goal 9 on industry, innovation and infrastructure; Goal 10 on reduced inequalities; and Goal 13 on climate action.

50. Approaching air quality from a human rights perspective highlights the principles of universality and non-discrimination, under which human rights are guaranteed for all persons, including persons living in vulnerable situations. A human rights perspective can also serve as a catalyst for accelerated action to achieve clean air, empower those working to improve air quality and serve as a North Star or Southern Cross to guide our actions as we navigate towards a healthy and sustainable future.

## A. Right to life

51. The right to life is universally recognized in human rights law. The Human Rights Committee, in 2018, stated: "Environmental degradation, climate change and unsustainable development constitute some of the most pressing and serious threats to the ability of present and future generations to enjoy the right to life."<sup>24</sup>

52. As noted earlier, air pollution causes 7 million premature deaths annually, including the deaths of more than 600,000 children. These staggering and almost incomprehensible statistics represent an egregious violation of the right to life.

## B. Right to health

53. The Universal Declaration of Human Rights includes health as part of the right to an adequate standard of living (art. 25). The International Covenant on Economic, Social and Cultural Rights enshrines the right to health and provides that the steps to be taken by States to achieve the full realization of that right "shall include those necessary for ... the improvement of all aspects of environmental and industrial hygiene" (art. 12). The

<sup>23</sup> See, for example, Kuwait (A/HRC/29/17, para. 157.257) and the former Yugoslavian Republic of Macedonia (A/HRC/26/10, para. 101.104).

<sup>24</sup> General comment No. 36 (2018) on the right to life, para. 62.

Committee on Economic, Social and Cultural Rights determined that the right to health extends to the “underlying determinants of health”, including safe drinking water, adequate sanitation, safe food, adequate housing and healthy working and environmental conditions.<sup>25</sup> The Committee has also encouraged individual States to increase their efforts to reduce air pollution in order to protect human rights.<sup>26</sup>

54. The number of people whose right to health is violated by air pollution is in the billions. Again, 90 per cent of all people live in places where the air quality fails to meet the guidelines established by WHO.

### C. Rights of the child

55. The Convention on the Rights of the Child, in describing the right to health, explicitly requires that States act in the best interests of the child and consider “the dangers and risks of environmental pollution” (art. 24 (2) (c)). This led WHO to conclude that “children have a basic human right to breathe clean air in their homes, schools, and communities”.<sup>27</sup>

56. The Committee on the Rights of the Child concluded that “States should take measures to address the dangers and risks that local environmental pollution poses to children’s health in all settings”.<sup>28</sup> In several concluding observations, the Committee has urged States to scale up and expedite actions to protect children from polluted air.<sup>29</sup>

## IV. Human rights obligations relating to clean air

57. As the previous mandate holder made clear, States have obligations to protect the enjoyment of human rights from environmental harm (A/HRC/25/53). The foreseeable adverse effects of poor air quality on the enjoyment of human rights give rise to extensive duties of States to take immediate actions to protect against those effects. In a joint statement issued in 2017, a group of United Nations experts said “a threat like this can no longer be ignored. States have a duty to prevent and control exposure to toxic air pollution and to protect against its adverse effects on human rights.”<sup>30</sup>

58. The framework principles on human rights and the environment clarify the three categories of State obligations: procedural, substantive, and special obligations towards those in vulnerable situations. Therefore, the framework principles can be operationalized in the context of air pollution in order to respect, protect and fulfil human rights.

59. The procedural obligations of States in relation to the right to breathe clean air include duties related to promoting education and public awareness; providing access to information; ensuring freedom of expression, association and assembly; facilitating public participation in the assessment of proposed projects, policies and environmental decisions; and ensuring affordable, timely access to remedies.

60. With respect to substantive obligations, States must not violate the right to breathe clean air through their own actions; must protect the right from being violated by third parties, especially businesses; and must establish, implement and enforce laws, policies and programmes to fulfil the right. States also must avoid discrimination and retrogressive measures.

<sup>25</sup> General comment No. 14.

<sup>26</sup> See E/C.12/MNG/CO/4, E/C.12/KWT/CO/2 and E/C.12/KAZ/CO/1.

<sup>27</sup> WHO, “Air pollution and children’s health: a global health emergency”, background document prepared for the First WHO Global Conference on Air Pollution and Health, Geneva, 2018.

<sup>28</sup> General comment No. 15 (2013) on the right of the child to the enjoyment of the highest attainable standard of health, para. 49.

<sup>29</sup> See CRC/C/BRA/CO/2-4, CRC/C/PAK/CO/5 and CRC/C/GBR/CO/5.

<sup>30</sup> “Toxic air pollution: UN rights experts urge tighter rules to combat ‘invisible threat’”, press release, 24 February 2017.

61. There are seven key steps that States must take in fulfilling the right to breathe clean air: monitor air quality and impacts on human health; assess sources of air pollution; make information publicly available, including public health advisories; establish air quality legislation, regulations, standards and policies; develop air quality action plans at the local, national and, if necessary, regional levels; implement an air quality action plan and enforce the standards; and evaluate progress and, if necessary, strengthen the plan to ensure that the standards are met.

62. At each of these stages, States must ensure that the public is fully informed and has an opportunity to participate in decision-making processes. Extra effort should always be made to reach out to women, children and others in vulnerable situations whose voices are too often not heard in environmental policy processes. States must pay special attention to environmental defenders working to protect the right to clean air.

#### **A. Monitoring air quality and health effects**

63. States must establish networks and programmes to monitor air quality and health effects, particularly in urban areas and other regions known to suffer from poor air quality. Direct monitoring data can be complemented by air quality observations from satellites and outputs from computer models. Monitoring is a prerequisite to fulfilling a State's obligation to provide information to the public and is also essential to informed policy-making.

64. Most high-income countries operate extensive air quality monitoring networks providing continuous, hourly measurements of pollution levels. However, these networks are less common or provide less comprehensive coverage in low- and middle-income countries where air quality is generally worse. Some countries, particularly in Africa, have no air quality monitoring stations at all. Several States with severe air quality problems, such as China and India, have made great strides in recent years in establishing hundreds (India) and thousands (China) of new air quality monitoring stations.

65. New technologies offer the possibility of leapfrogging expensive air quality monitoring stations. Stationary and dynamic networks of low-cost sensors are much less expensive. Air pollution sensors can be deployed on cell phones, drones and vehicles by Governments, citizens, communities and businesses. Networks of these devices, integrated with satellite data and modelling, could complement regulatory monitoring and help identify air pollution hotspots. However, questions regarding the reliability and consistency of low-cost sensors need to be addressed by standards and protocols.

#### **B. Assessing the sources of air pollution**

66. Reducing the disease burden attributable to air pollution and fulfilling the right to clean air require understanding the types of pollution and major contributing sources. This is critical for identifying the highest priority and most cost-effective actions for controlling emissions to protect public health, human rights and the environment. Source assessments have been completed in many high-income nations, as well as in China and India, although there is substantial uncertainty regarding emissions from the large informal sectors in these economies.<sup>31</sup> Modelling and forecasting inform estimates of exposure and health impacts, provide a basis for air quality advisories and identify measures needed to control specific emissions. Without adequate information, designing effective policies, programmes and other interventions is impossible.

#### **C. Public reporting on air quality**

67. In addition to systematically collecting air quality information, States must share this information in a timely, accessible way, educate the public about the health risks posed by

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<sup>31</sup> Health Effects Institute, *State of Global Air 2018: A Special Report on Global Exposure to Air Pollution and its Disease Burden* (Boston, 2018).

poor air quality and have systems in place to provide warnings when pollution poses an acute health threat, particularly for vulnerable populations.

68. In its general recommendation 32/2018, the National Human Rights Commission of Mexico described that country's inadequate air quality monitoring system as a violation of the public's right to environmental information and a violation of the right to a healthy environment.

#### **D. Establishing air quality legislation, regulations and standards**

69. States have an obligation to "establish and maintain substantive environmental standards that are non-discriminatory, non-retrogressive and otherwise respect, protect and fulfil human rights" (A/37/59, annex, framework principle 11). WHO has published guidelines for ambient air quality as well as indoor air quality, which States should incorporate as legally binding national standards.<sup>32</sup> In recognition of the different national contexts and capacities, WHO created interim guidelines for ambient particulate matter. The focus of the indoor air quality guidelines is on shifting to cleaner fuels and technologies for cooking, heating and lighting. These guidelines are under review because new evidence indicates that there is no safe level of exposure for some air pollutants, such as fine particles.

70. A global review of national air quality standards published in 2017 revealed that few States have incorporated the WHO guidelines into their air quality standards.<sup>33</sup> Not one State has adopted all of the WHO air quality guidelines, and only seven have adopted the most stringent WHO guideline for fine particulate matter. Incredibly, 80 States have no air quality standards or guidelines at all. Even in the European Union, air quality standards fail to meet the WHO guidelines. For example, the annual fine particulate limit is 2 1/2 times higher than the WHO recommendation. In the absence of strong standards, it is likely impossible to fulfil the right to breathe clean air.

71. Air quality standards should protect the most vulnerable members of society, in part by applying the precautionary principle and using adequate margins of safety. National standards must take into consideration the best interests of children.<sup>34</sup> The complete absence or weakness of national air quality standards in many States indicates a widespread failure to fulfil this fundamental human rights obligation, with devastating impacts upon the health of children around the world.

#### **E. Air quality action plans**

72. States must develop air quality action plans that identify the most important and effective measures that can be implemented to improve air quality, particularly for vulnerable populations.

73. Pursuant to principles of international human rights law, the right to breathe clean air is subject to progressive realization, recognizing that in some low- and middle-income States it cannot be immediately fulfilled. States have discretion to determine which air quality policies and programmes are best suited to their particular circumstances. However, they have obligations, to the maximum of their available resources (in some cases supplemented with international assistance), to implement concrete and effective measures to prevent increases in air pollution, improve air quality and fulfil the right to breathe clean air. Some obligations, such as non-discrimination and non-regression, are of immediate

<sup>32</sup> WHO, *WHO Guidelines for Indoor Air Quality: Household Fuel Combustion* (Geneva, 2014); and WHO Regional Office for Europe, *Air Quality Guidelines: Global Update 2005: Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide* (Copenhagen, 2006).

<sup>33</sup> M.K. Joss and others, 2017. "Time to harmonize national ambient air quality standards for global health equity", *International Journal of Public Health*, vol. 62, No. 4 (May 2017), pp. 453–462.

<sup>34</sup> Convention on the Rights of the Child, art. 3 (1).

effect. The principle of non-regression means States must not weaken air quality regulations, standards or policies.

74. A comprehensive assessment of potential air quality actions in the Asia-Pacific region identified 25 measures that could save millions of lives annually, reduce crop losses by 45 per cent, fulfil the right to breathe clean air for a billion people by 2030 and provide benefits for water, soil, forests and biodiversity. The measures include conventional actions (e.g. standards for power plants, industry and vehicles), less common actions (e.g. restrictions on burning agricultural waste and garbage and rules governing livestock manure) and development actions with air quality co-benefits (e.g. clean cooking, energy efficiency incentives and improved public transit). The annual costs of \$300–\$600 billion would be offset by benefits for human health, food production, water security, environmental quality and climate protection.<sup>35</sup>

75. As mentioned earlier, certain aspects of air pollution cannot be addressed effectively without coordinated international action. Under international human rights law, States have an obligation to cooperate in addressing environmental problems that cross national borders, including transboundary air pollution.

## **F. Implementing and enforcing air quality rules**

76. States must ensure the effective enforcement of their environmental standards against public and private actors (ibid., framework principle 12). Environmental laws, regulations and standards are useless if they are not implemented and enforced. Sufficient human and financial resources must be allocated to government agencies responsible for enforcing them.

77. States are obligated to ensure that people have access to remedies, through judicial or similar processes, when their right to breathe clean air is being threatened or violated or when other legal obligations related to air quality are not being fulfilled. In some States, efforts to improve the environmental rule of law are needed to enable implementation and enforcement.

## **G. Evaluating and revising air quality standards and plans**

78. An essential element of efforts to improve air quality is to evaluate progress (or the lack thereof) on a regular basis and revise air quality standards and plans accordingly. New scientific evidence and public participation must also be incorporated into the review and revision processes.

### **Business obligations related to air quality**

79. Businesses are obliged to respect human rights in all aspects of their operations, yet are a major source of air pollution. In terms of their potential impacts on air quality, businesses should comply with the Guiding Principles on Business and Human Rights as well as the Children's Rights and Business Principles.

80. Regrettably, there are countless examples of businesses violating the right to breathe clean air. For example, some Swiss businesses are selling extremely dirty diesel and gasoline in West Africa (containing sulphur levels hundreds of times higher than European law permits).<sup>36</sup> Some vehicle manufacturers acted fraudulently in selling millions of vehicles equipped with “defeat devices” that enabled vehicles to pass emission tests but produce illegal quantities of pollution under normal driving conditions. Businesses have exported polluting facilities, outdated manufacturing equipment and used vehicles from

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<sup>35</sup> UNEP, *Air Pollution in Asia and the Pacific: Science-Based Solutions* (Bangkok, 2018).

<sup>36</sup> Public Eye, *Dirty Diesel: How Swiss Traders Flood Africa with Dirty Fuel* (Lausanne, 2016).

high-income nations to low-income nations, where environmental and occupational standards are lower or not vigorously enforced.<sup>37</sup>

## H. Environmental human rights defenders

81. Across the world there has been a terrible increase in the number of people being murdered, criminalized, harassed, sued or otherwise intimidated because of their courageous efforts to protect the environment and human rights.<sup>38</sup> Individuals working to protect the right to breathe clean air are among the victims. One example is Phyllis Omido of Kenya, who was subjected to death threats because she opposed a lead smelter operating near her home. Gloria Capitan, a heroic woman from the Philippines, was killed because of her opposition to the coal industry.

82. States must prioritize action to protect environmental human rights defenders, ideally by establishing institutions and rules to address the root causes of violence and harassment, celebrating and supporting defenders' work instead of attacking it and ensuring justice by holding perpetrators of violence accountable for their actions.<sup>39</sup>

## V. Good practices

83. WHO observed in 2017 that "experiences and insights about good practices are not widely accessible or used" in the area of air pollution.<sup>40</sup> Therefore, the present report highlights a number of laws, policies, programmes and initiatives that have prevented or alleviated human rights violations caused by air pollution.

84. Many States reported to the Special Rapporteur that they are making dedicated efforts to improve air quality and protect their peoples' right to live in a healthy and sustainable environment.<sup>41</sup> Some are establishing or improving air quality monitoring networks, including Azerbaijan, Bolivia (Plurinational State of), Jordan, Mali, Morocco and Qatar. Bulgaria, Costa Rica, Croatia, Singapore and Slovakia are enacting increasingly stringent regulations for industry, vehicles, fuels and other sectors. Improving air quality within buildings is a priority for Bulgaria, Hungary, Montenegro and Poland. National action plans to improve air quality are being developed or implemented in Bahrain, Colombia, Ireland, Kuwait, Montenegro and Uruguay. Slovenia has a website dedicated to air quality action. Colombia, Costa Rica and Uruguay are promoting renewable energy and electric vehicles. Singapore created a vehicular emissions scheme that provides for surcharges or rebates on new and imported vehicles based on their environmental impact. Mali has an agency dedicated to rural electrification and adopted a law protecting human rights defenders, including environmentalists.<sup>42</sup>

85. The United Nations has established various initiatives to address air pollution. The Climate and Clean Air Coalition focuses on reducing short-lived climate pollutants. The goals of the Sustainable Energy for All initiative are to achieve universal access to modern energy services, double the global rate of improvement in energy efficiency and double the share of renewable energy in the global energy mix. Other initiatives include BreatheLife,

<sup>37</sup> A. Levinson and M.S. Taylor, "Unmasking the pollution haven effect", *International Economic Review*, vol. 49, No. 1 (February 2008), pp. 223–254.

<sup>38</sup> Global Witness, *At What Cost? Irresponsible Business and the Murder of Land and Environmental Defenders in 2017* (London, 2018).

<sup>39</sup> See Declaration on the Rights and Responsibility of Individuals, Groups and Organs of Society to Promote and Protect Universally Recognized Human Rights and Fundamental Freedoms (Declaration on Human Rights Defenders); and Inter-American Court of Human Rights, *Kawas Fernández v. Honduras*, Merits, Reparations and Costs, Judgment of 3 April 2009.

<sup>40</sup> WHO, "Draft road map for an enhanced global response to the adverse health effects of air pollution", document EB 138/17, p. 2, note 1.

<sup>41</sup> The submissions made in response to the Special Rapporteur's call for inputs are publicly available at [www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/AirPollution.aspx](http://www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/AirPollution.aspx).

<sup>42</sup> Law No. 2018-003 of 12 January 2018 on human rights defenders.

the Urban Health Initiative (with pilot projects in Accra and Kathmandu) and the Global Platform on Air Quality and Health.

#### A. Cleaner air: progress in reducing household air pollution

86. The proportion of households using solid fuels for cooking and heating has been declining in Latin America, parts of Asia (including China, India and Indonesia), Europe and the Eastern Mediterranean. This has contributed to a significant decline in premature deaths from household air pollution.<sup>43</sup> It is strong evidence of the preventable nature of this problem, which can be effectively addressed by government policies and programmes, market-oriented solutions and targeted development assistance. However, there has been only modest progress in Africa.

87. There are many initiatives under way to accelerate the replacement of polluting fuels and cooking/heating/lighting technologies with clean fuels and clean technologies.<sup>44</sup> The Clean Cooking Alliance is working towards an objective of having at least 100 million homes adopt clean fuels and stoves by 2020. WHO has developed a Clean Household Energy Solutions Toolkit and “guidelines for indoor air quality: household fuel combustion” that clarify what is considered “clean”. Cooking for Life, a project developed by the World LPG Association and the United Nations, aims to transition households from using polluting fuels to liquefied petroleum gas (LPG) for cooking.

88. Pradhan Mantra Ujjwala Yojana is an Indian government programme started in 2016 that targets women living in poverty. Funds are provided directly to women to purchase LPG stoves, connections and fuel. More than 50 million new LPG connections have already been made.<sup>45</sup> The goal is to have LPG in 95 per cent of households by 2022. This programme has a positive impact on the lives of millions of women, girls and households living in poverty by providing them with access to safe, affordable cooking technologies and fuels and reducing time previously spent gathering fuels. However, many households with LPG connections continue to use solid fuels sometimes for cooking (for economic and cultural reasons).<sup>46</sup>

89. Indonesia implemented a successful “Zero Kero Programme”, launched in 2007, to convert households from kerosene to LPG.<sup>47</sup> Kerosene is less efficient than LPG and produces more household air pollution. Over 57 million free LPG starter packages (including a one-burner stove, hose, regulator and a filled 3-kilogram cylinder) were distributed to households and micro-businesses. Total household kerosene use in Indonesia dropped 92 per cent between 2006 and 2015, while per capita LPG use quintupled. Although household air quality improved, some households practise fuel stacking (i.e. the side-by-side use of different fuels and stoves). The programme resulted in net savings in the billions of dollars for the Government by replacing kerosene subsidies with smaller LPG subsidies (taking into account the cost of the starter packages). The programme also reduced overall greenhouse gas emissions from cooking. A post-implementation survey showed that 99.8 per cent of the households preferred using LPG to kerosene, citing its greater efficiency, speed of cooking and cleanliness.<sup>48</sup>

90. The national efficient cooking programme of Ecuador removes LPG subsidies (previously costing \$700 million per year) and helps households switch to induction

<sup>43</sup> Health Effects Institute, *State of Global Air 2018*.

<sup>44</sup> A. Quinn and others, “An analysis of efforts to scale up clean household energy for cooking around the world”, *Energy for Sustainable Development*, vol. 46 (October 2018), pp. 1–10.

<sup>45</sup> See [www.pmujjwalayojana.com](http://www.pmujjwalayojana.com).

<sup>46</sup> A. Kar and H. Zerriffi, “From cookstove acquisition to cooking transition: framing the behavioural aspects of cookstove interventions”, *Energy Research and Social Science*, vol. 42 (August 2018), pp. 23–33.

<sup>47</sup> K. Thoday and others, “The mega conversion program from kerosene to LPG in Indonesia: lessons learned and recommendations for future clean cooking energy expansion”, *Energy for Sustainable Development*, vol. 46 (December 2018), pp. 71–81.

<sup>48</sup> World LPG Association, Kerosene to LPG conversion programme in Indonesia, 2018.

cooktops and renewable electricity. The programme aims to replace LPG-based cooktops and water heating systems with electric systems for 3 million families. Families will save time cooking, and the programme will reduce greenhouse gas emissions.<sup>49</sup>

91. The International Energy Agency estimated that annual investments of \$4.7 billion could achieve universal access to clean cooking by 2030.<sup>50</sup> This relatively modest investment would produce tremendous returns: millions of premature deaths avoided each year, improved health, better quality of life, expanded economic opportunities, reduced deforestation and decreased greenhouse gas emissions.

## B. Cleaner air: progress in reducing ambient air pollution

92. There is compelling evidence that enacting and enforcing strong air quality regulations saves lives and prevents illnesses. Since the Clean Air Act was enacted in 1970, the economy of the United States of America has grown by 262 per cent (measured by increased gross domestic product) while achieving average reductions of 73 per cent for six main air pollutants. Full implementation of the Clean Air Act will prevent 230,000 premature deaths per year by 2020. Its costs are measured in billions of dollars, while the benefits are in the trillions.<sup>51</sup> Reduced air pollution in California resulted in significant improvements in children's lung function.<sup>52</sup>

93. Air quality in China is improving as a result of strong laws, policies and actions. China strengthened its Law on the Prevention and Control of Atmospheric Pollution Control and invested hundreds of billions of dollars to improve air quality. The Government is implementing a "three-year plan on defending the blue sky", with specific targets for reducing air pollution by 2020. Levels of particulate matter in 74 cities decreased by 33 per cent in five years.<sup>53</sup> China also achieved substantial reductions in nitrogen oxides and sulphur dioxide. Cleaner air is linked to significant declines in infant mortality.<sup>54</sup>

94. Shenzhen, in southern China, has grown from a town of 30,000 in 1980 to a megalopolis of 12 million, but managed to maintain 45 per cent of the metropolitan area as green space. Shenzhen converted its entire municipal bus fleet – more than 16,000 buses – to fully electric, making a significant contribution to improving urban air quality.

95. Several States explicitly recognize the right to breathe clean air. Examples include the Philippines Clean Air Act, the Environmental Code of France and the General Law on the Environment and Natural Resources 2000 of the Dominican Republic. The right to breathe clean air is also recognized at the subnational level in some countries, including the state constitutions of Pennsylvania and Massachusetts in the United States.<sup>55</sup> In other countries, including India and Pakistan, courts have clarified that the right to breathe clean air is constitutionally protected because it is an integral component of the rights to life and health. The National Strategy for Air Quality Management of Lebanon states: "Every citizen has the right to enjoy clean air."

<sup>49</sup> See <https://unfccc.int/climate-action/momentum-for-change/activity-database/efficient-cooking-program-ecp>.

<sup>50</sup> World Bank, *The State of the Global Clean and Improved Cooking Sector*, p. 8.

<sup>51</sup> United States Environmental Protection Agency, *The Benefits and Costs of the Clean Air Act from 1990 to 2020* (2011).

<sup>52</sup> W.J. Gauderman and others, "Association of improved air quality with lung development in children", *New England Journal of Medicine*, vol. 372, No. 10 (5 March 2015), pp. 905–913.

<sup>53</sup> J. Huang and others, "Health impact of China's Air Pollution Prevention and Control Action Plan: an analysis of national air quality monitoring and mortality data", *Lancet Planetary Health*, vol. 2, No. 7 (July 2018), pp. e313–323.

<sup>54</sup> S. Tanaka, "Environmental regulations on air pollution in China and their impact on infant mortality", *Journal of Health Economics*, vol. 42 (July 2015), pp. 90–103.

<sup>55</sup> Constitution of the State of Pennsylvania: art. 27: "The people have a right to clean air ...."

96. In Europe, a series of legal developments has established that European citizens have an enforceable right to breathe clean air.<sup>56</sup> In 2008, the European Union amended its rules governing air quality.<sup>57</sup> Many States are not in compliance with the new rules. Successful lawsuits based on violations of air quality standards have been brought by civil society organizations including ClientEarth in the United Kingdom of Great Britain and Northern Ireland, Friends of the Earth in France, Deutsche Umwelthilfe in Germany and others in Austria, Czechia and Poland.<sup>58</sup>

97. In its latest report, the Intergovernmental Panel on Climate Change calls for a two-thirds reduction in coal power generation in 2030 and a near-total elimination by 2050.<sup>59</sup> A growing number of States have eliminated the use of coal to generate electricity, are phasing out coal or are committed to never using coal for electricity generation. Canada and the United Kingdom created the Powering Past Coal Alliance in 2017 and have been joined by more than 25 States pledging to end coal use by 2030. China and India have closed coal-fired electricity plants located in proximity to large cities. The number of proposed coal-fired power plants has fallen dramatically since 2015 and new construction is almost offset by the retirement of existing coal plants.<sup>60</sup>

98. Two initiatives that have dramatically improved air quality in many countries are the phase-out of leaded gasoline and major reductions in the sulphur content of transport fuels. These actions have produced enormous health, environmental and economic benefits, valued in the trillions of dollars.<sup>61</sup>

99. Curitiba, a large Brazilian city, has built an extensive rapid bus system. In 2013, a plan to add 300 kilometres of bicycle paths was launched. These transport initiatives have contributed to making life expectancy in Curitiba two years longer than the national average and to relatively low infant mortality.<sup>62</sup> Estonia piloted free public transit in its capital in 2013 and recently extended the system across the whole country. There are approximately 100 public transit systems in the world, from Dunkirk, France, to Changning, China, offering free fare programmes.

100. A growing number of countries (e.g. China, Germany, India and the United Kingdom) have pledged to phase out the sale of internal combustion vehicles by dates ranging from 2030 to 2040.<sup>63</sup>

101. Norway has achieved a remarkably high proportion of electric vehicle sales through a variety of incentives and disincentives. The most recent data indicate that 60 per cent of new vehicle sales in Norway are fully electric or gas/electric hybrids, compared with 1 per cent in the United States and 2 per cent in China. Throughout the European Union, States impose vehicle registration taxes and fuel taxes intended to encourage the purchase of clean vehicles and discourage the purchase of more polluting models.

102. In California, rules prohibit siting new schools within 500 feet (150 metres) of busy roads, in response to scientific evidence about the adverse health effects of traffic-related air pollution on developing lungs, brains and other organs.

103. Shipping is a major source of air pollution. The International Maritime Organization recently established a strict new limit for the sulphur content of fuel used in shipping. This change will prevent an estimated 570,000 premature deaths between 2020 and 2025.<sup>64</sup>

<sup>56</sup> A. Andrews, *The Clean Air Handbook: A Practical Guide to EU Air Quality Law* (London, ClientEarth, 2015).

<sup>57</sup> Directive 2008/50/EC on ambient air quality and cleaner air for Europe.

<sup>58</sup> See [www.right-to-clean-air.eu/en/](http://www.right-to-clean-air.eu/en/).

<sup>59</sup> Intergovernmental Panel on Climate Change, *Special Report: Global Warming of 1.5°C* (2018).

<sup>60</sup> See [www.endcoal.org](http://www.endcoal.org).

<sup>61</sup> E. Gould, "Childhood lead poisoning: conservative estimates of the social and economic benefits of lead hazard control", *Environmental Health Perspectives*, vol. 117, No. 7 (July 2009), pp. 1162–1167.

<sup>62</sup> WHO, *Inheriting a Sustainable World?*

<sup>63</sup> Center for Climate Protection, Actions by countries to phase out internal combustion engines, 2018.

104. Many economists support putting fees or taxes on air emissions, thus implementing the polluter pays principle. A challenge is to ensure that the price on air emissions is high enough to produce substantial reductions, as affected businesses will raise competitiveness concerns. Another challenge is that different pollutants have different health and environmental impacts, so prices should be higher on emissions of more harmful substances.

105. Good examples include a tax in Chile on stationary sources of air pollution that is higher for facilities located in more densely populated areas and the national pollution tax in France that imposes higher taxes on more harmful air pollutants.

106. The Economic Commission for Europe Convention on Long-range Transboundary Air Pollution is an excellent example of regional cooperation. The Convention was signed in 1979, entered into force in 1983 and is now accompanied by eight protocols. Fifty-one parties from three continents have collaborated to set emission reduction targets, monitor compliance, build capacity and raise awareness. Sulphur dioxide emissions in the region have declined 70 per cent since 1990, while nitrogen dioxide emissions fell 40 per cent.<sup>65</sup> The 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, as amended in 2012, is the first legally binding agreement containing obligations to reduce short-lived climate pollutants.

107. The Aarhus Convention and its Protocol on Pollutant Release and Transfer Registers provide other examples of effective international instruments. The Aarhus Convention guarantees three key procedural rights (information, participation and access to justice) and promotes good practices as means of fulfilling the right to a healthy environment.

108. In response to problems caused by transboundary air pollution, Singapore created a programme in 2013 to subsidize medical treatment for air pollution-related illnesses experienced by vulnerable populations including children, the elderly and low-income residents. Approximately 100,000 people benefited from these medical subsidies.

## VI. Conclusions and recommendations

109. **Given the devastating impacts of poor air quality on people's lives, health and human rights, actions must be taken rapidly and systematically, with a priority focus on ameliorating conditions for the most vulnerable. Fulfilling the right to breathe clean air goes hand in hand with achieving the Sustainable Development Goals, including healthy lives for all, sustainable cities, universal access to clean energy and effective action to address climate change. A rapid shift away from fossil fuels to renewables such as solar and wind (except in the context of clean cooking, which often involves a shift to LPG) could save as many as 150 million lives over the course of the twenty-first century by reducing air pollution.**

110. **The failure to respect, protect and fulfil the right to breathe clean air is inflicting a terrible toll on people all across the world. The statistics presented in the present report depict a public health catastrophe, yet the numbers fail to capture the magnitude of human suffering involved. Each premature death, every illness and every disability afflicts an individual with hopes, dreams and loved ones. Air pollution is a preventable problem. The solutions – laws, standards, policies, programmes, investments and technologies – are known. Implementing these solutions will of course entail large investments, but the benefits of fulfilling the right to breathe clean air for all of humanity are incalculable.**

111. **In order to respect, protect and fulfil the right to breathe clean air, States must implement the seven steps outlined in paragraphs 63–78 (monitoring, source assessment, public information, air quality standards, action plan, implementation/enforcement and evaluation). States should review existing laws,**

<sup>64</sup> The regulation in revised annex VI to the International Convention for the Prevention of Pollution from Ships (MARPOL) limiting the sulphur content of bunker fuel to a maximum of 0.5 per cent will enter into force on 1 January 2020.

<sup>65</sup> Economic Commission for Europe, *Towards Cleaner Air: Scientific Assessment Report 2016*, 2017.

standards, policies and programmes to determine if they are consistent with their human rights obligations related to air quality, and amend them if necessary.

112. Specific actions that States should consider as part of the national air quality action plan include:

- (a) Prohibiting the construction of new fossil fuel power plants and replacing existing fossil fuel power plants with renewable sources of energy (by 2030 in high-income nations and 2050 elsewhere);
- (b) Eliminating all remaining fossil fuel subsidies, except for LPG cooking programmes;
- (c) Supporting the growth of distributed renewable energy generation systems;
- (d) Reducing, minimizing or avoiding government actions that cause air pollution;
- (e) Conducting assessments of the environmental, health and human rights implications of new projects, policies and plans that could cause air pollution;
- (f) Disseminating information about best available technologies;
- (g) Requiring industry to reduce and eliminate emissions of harmful air pollutants;
- (h) Requiring the oil and gas industry to recover and use methane and other gases released during the exploration, development and production processes;
- (i) Prioritizing emission reductions from high-polluting industrial facilities such as coke ovens, smelters, refineries, cement plants and brick kilns;
- (j) Refusing to issue permits for new polluting facilities or activities in areas that are air pollution hotspots until air quality in such areas meets national standards and would continue to meet those standards despite the additional pollution;
- (k) Ensuring an integrated approach to tackling air pollution and climate change to maximize co-benefits;
- (l) Promoting compact and mixed-use urban design;
- (m) Protecting and expanding urban green spaces;
- (n) Prioritizing investments in safe walking, safe cycling and rapid public transit over infrastructure for private vehicles;
- (o) Shifting to cleaner vehicles by strengthening emission standards and fuel efficiency rules while accelerating the transition to zero emission vehicles;
- (p) Implementing building codes, rules and standards that substantially increase energy efficiency in buildings;
- (q) Improving waste management by prohibiting the open burning of garbage, avoiding incineration and requiring the capture of methane at landfills;
- (r) Creating laws, policies and programmes to discourage or prohibit burning of crop residue or agricultural waste and assist farmers to shift to cleaner practices;
- (s) Lowering ammonia emissions from livestock manure and fertilizer use, in part by promoting a predominantly plant-based diet;
- (t) Educating the public about the adverse health effects of air pollution and the benefits of implementing solutions;
- (u) Using government procurement policies to advance all of the foregoing.

113. All new or amended laws, standards, policies and programmes should incorporate public participation, with an emphasis on including vulnerable populations and communities suffering from poor air quality. Accessible, affordable

and effective judicial or quasi-judicial mechanisms are essential for enforcement, accountability and ensuring remedies are available if the right to clean air is threatened or violated.

114. States must accelerate programmes to replace solid fuels and kerosene with cleaner energy and clean technologies. A concerted effort is required to address non-financial barriers to clean cooking by extending fuel supply infrastructure, implementing policies to reduce the variability of fuel prices and promoting gender equity in household decision-making. States must also educate the public about the adverse health consequences of household air pollution and the availability of cleaner alternatives. Transitional fuels and technologies may achieve major health gains at a lower cost, but the end goal is clean fuels and clean technologies, not merely less dirty ones. States should increase their financing to reduce and eliminate household air pollution and achieve universal access to clean cooking by 2030

115. Governments, businesses, international agencies and philanthropic foundations must accelerate their efforts to ensure access to clean energy. High-income countries should provide economic and technical assistance to low-income countries to support their efforts to fulfil the right to breathe clean air. The international financial institutions (e.g. World Bank, International Monetary Fund, Asian Development Bank and European Investment Bank) must avoid financing projects that will cause significant increases in air pollution.

116. In order to fulfil their responsibility to respect the human right to breathe clean air, businesses should:

- (a) Make every effort to reduce emissions of air pollutants from their facilities and supply chains;
- (b) Stop delaying the transition away from fossil fuels;
- (c) Embrace the extraordinary economic opportunities presented by renewable energy, energy storage, energy efficiency, clean cook stoves, heating and lighting and zero emission vehicles;
- (d) Contribute to and support efforts to shift towards the goal of a pollution-free circular economy.

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