Our planet avoided a catastrophe. The concerted actions under the Montreal Protocol of the Vienna Convention virtually eliminated the emission of ozone-depleting substances (ODSs). Thanks to this action, the ozone layer, the invisible shield that protects all life on Earth from harmful ultraviolet (UV-B) radiation from the sun, is slowly recovering. Assuming continued compliance with the Protocol, the ozone layer should completely heal by 2060, continuing to protect the health of people, ecosystems and economies.

But we cannot afford to rest on our laurels. We need to keep observing the ozone layer and the remaining amounts of ODSs in the atmosphere, monitoring the impacts of our actions and evaluating the recovery of the ozone layer. The unexpected increase in emissions of ozone-depleting trichlorofluoromethane (CFC-11) reported by scientists in 2018 shows the importance of our continued vigilance. Had we not been monitoring the atmosphere for ODSs, we would never have detected the unexpected emissions, which may be due to illegal production of CFC-11. This scientific finding spurred the parties to the Montreal Protocol to launch an urgent response.

More resources are needed to facilitate monitoring of the recovery of the ozone layer and inter-calibration of current and future satellites dedicated to ozone surveillance. The Trust Fund for Research and Systematic Observations, which operates under the Vienna Convention for the Protection of the Ozone Layer, plays an important role in this effort.

How does the Trust Fund support research and systematic ozone observations?

- The fund supports national and international research and monitoring activities in developing countries and countries with economies in transition.
- An Advisory Committee, established in 2015, advises the Ozone Secretariat and the World Meteorological Organization (WMO) on planning, developing and implementing the Trust Fund's activities.
- Decisions on how to distribute the funds effectively are informed by the recommendations of research and monitoring needs developed by the Ozone Research Managers at their triennial meetings where they review national and international research and monitoring programmes.
What has been achieved?
With funding of about US$430,000 since 2003, the Trust Fund has supported 17 activities, which include:
• Relocation of Dobson spectrophotometers (the anchor for satellite validation) in two countries;
• Training of about 90 scientists and instrument operators from some 30 countries via workshops, calibrations and site visits;
• Calibration and intercomparison of ozone measurement instruments for 20 countries;
• An ozonesonde training and calibration campaign benefitting operators from eight tropical stations in seven developing countries.
The activities have enhanced the quality and quantity of ozone data used for satellite calibration and trend analyses.

Due to limited resources, a number of project proposals submitted in 2016 and 2017 remain unfunded.

What needs to be done for continued protection of the ozone layer?
• We need to enhance the contribution of developing countries and countries with economies in transition to ozone layer science. This effort should include calibrating, intercomparing and relocating monitoring instruments as well as capacity-building for optimal results. Such participation will improve global data availability and enable these countries to participate in ozone layer science as equal partners with developed countries, for the global good.
• The ground-based ozone observing system is not adequate, particularly in the tropics, where the changing climate plays a major role in influencing the recovery of the ozone layer. As this greatly limits the understanding and prediction of future ozone layer changes, more observations are needed at those locations.
• Current observational ‘gold standard’ instruments are expensive and difficult to deploy. They are getting old. Moreover, the expertise to use and repair them has dwindled to a few people who will be retiring soon. We therefore need to deploy newer, smarter, more affordable and easy-to-use sensors and intercompare them with these current instruments.

How can the Trust Fund help?
• The fund can address the above needs by providing seed funding to catalyze action by the many developing countries and countries with economies in transition, which are ready and willing to play their part.
• The fund, if expanded to help monitor ozone depleting substances, can greatly contribute to ongoing research and monitoring activities that provide early warning on whether unanticipated chemicals are threatening the ozone layers recovery.

Who will benefit from the Trust Fund?
The emerging scientific workforce of the developing world, the global scientific community, policymakers and ultimately all people, who rely on a robust ozone layer for their protection, will benefit from increased monitoring through the fund, as everybody relies on the ozone layer to shield us from harmful UV-B radiation. More contributions to the fund are needed to ensure:
• Better capacity and capability in observations and related science in the developing world;
• Better integration of scientists from the developing world into the global science community;
• Better data for international activities, such as the WMO - Global Atmosphere Watch and scientific assessments;
• More informed decision-making based on science at all levels thanks to increased engagement of developing countries and countries with economies in transition.

What will donors get?
• Scientific data from new locations will have many uses, including validation (ground-truthing) of the satellite observations;
• Strengthened cooperation and partnership between the developed and developing world;
• Increased buy-in from the developing world on addressing and solving global environmental issues;
• Value-added global ozone research as a result of targeting efforts where other organizations and countries cannot;
• Assurance that risks to human health and economies are recognized early and addressed effectively;
• Great appreciation for supporting the global efforts of the Trust Fund.

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