Federal Ministry
of Food
and Agriculture

UNECE

Convention on Long-range
Transboundary Air Pollution

40 YEARS

ICP FORESTS

On the Pulse of European Forests

40 years of Pan-European Forest Monitoring:
From Air Pollution to Climate Change

ICP Forests 40th Anniversary Report under the UNECE Convention
on Long-range Transboundary Air Pollution (Air Convention)

wge Working Group on Effects of the Convention on Long-range Transboundary Air Pollution

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Introduction: The Air Convention's journey in combating transboundary pollution

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In the early 1980s, a worrying trend was observed, particularly in the forests of northern, central and eastern Europe: The tree crowns appeared severely defoliated, indicating a decline in tree vitality. Among other factors, scientists identified air pollution, caused by emissions from industries, power plants, agriculture, traffic, and domestic heating, as a possible reason for this development. As air pollution is not confined by national borders and can travel thousands of kilometers from its source, it quickly became a transnational concern. For forest ecosystems, pollutants such as sulphur dioxide, nitrogen oxides, and ground-level ozone can be particularly harmful. Once deposited on soil and vegetation, these substances can lead to acidification, excessive nitrogen enrichment (eutrophication), causing nutritional imbalances in trees and reduced growth and vitality.

From environmental decline to joint action

However, forests were by far not the only ecosystems affected by air pollution. Researchers had already begun to investigate this topic in the 1960s, when fish populations were decimated in acidified lakes. Building on the growing recognition of air pollution's negative effects, two conferences were held: the UN conference on the Human Environment (1972) and the Helsinki Conference on Security and Cooperation in Europe (1975). Both events paved the way for international discussions on collaborative efforts to reduce air pollution.

In 1979, such dialogues came to a head when 32 countries signed the UNECE Convention on Long-range Transboundary Air Pollution or Air Convention in Geneva. It was the first international treaty dealing with air pollution on a broad regional basis. Four years later, in 1983, the Convention came into force and since then serves as a common framework for transboundary co-operation on air pollution, which is now based on eight Protocols.

Among these is the Gothenburg Protocol of 1999 on the prevention of acidification, eutrophication, and ground-level ozone. It is special because it considers the negative effects of multiple pollutants, namely sulphur dioxide, nitrogen oxides, ammonia, volatile organic compounds, and ozone.

Cleaner air, but new challenges lie ahead

The Air Convention has already demonstrated significant success. With now 51 participating countries committed to cleaner air, joint efforts have led to substantial reductions in harmful emissions since 1990. Sulphur dioxide emissions have decreased by around 80%, while nitrogen oxides have been reduced by almost 60%. Additionally, emissions of fine particles have decreased by more than 40%, and significant progress has been made in curbing heavy metal pollution. Peak ozone levels have also declined in Europe and North America since the turn of the millennium.

Programs such as ICP Forests have been established to provide a framework for joint monitoring and reporting, which is necessary for providing the common understanding required to undertake air pollution reduction measures. These collective efforts have helped in reducing the pressure of air pollution on European forests. However, new challenges linked to e.g. climate change and its interaction with air pollution have emerged, highlighting the importance of continued international co-operation.

On the occasion of the 40th anniversary of ICP Forests, this brochure guides you through the development of the program (Part 1), presents scientific findings and trends from the community that illustrate the status of European forests over the past decades (Part 2), highlights key scientific insights as science stories (Part 3), and provides an outlook on the future of ICP Forests (Part 4).

http://icp-forests.net

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