

## **Unit 7. Environmental monitoring\***

### **What is environmental monitoring?**

Environmental monitoring can be described as a programme of recurring, systematic studies that reveal the state of the environment. The specific aspects of the environment to be studied are determined by our environmental objectives, our environmental legislation, and Sweden's reporting obligations under international directives and conventions. The environmental policies of the European Union in particular call for extensive international reporting.

The purpose of environmental monitoring is to show how well we are meeting our environmental objectives and to help detect new environmental issues. The results are also of fundamental importance to environmental management in general, as the drafting and prioritisation of environmental policies is based on the findings of environmental monitoring. The published results make it possible for anybody to take part in the political debate.

### **Purpose of environmental monitoring**

The aim of environmental monitoring is to describe the state of the environment, to show how well our environmental objectives are being met, and to warn of new environmental issues.

Environmental monitoring is a long-term activity. Measurements must often be taken over long periods in order to show whether a change is due to human activity or natural variation.

Environmental monitoring is a strategic instrument for chasing progress on the environmental objectives and on remedial actions. It provides a current description of the state of the environment. By juxtaposing current and past states we can detect changes in the environment. This enables us to see whether past measures have had the desired effect, or whether further study is necessary to determine whether or not an observed change is a sign of a problem.

The results of environmental monitoring are the basis for our international reporting and for our official statistics on the state of the environment.

Environmental monitoring is also an instrument for the development of environmental work in general, and it has a dynamic role in the drafting of environmental objectives, environmental quality standards, and quality criteria. The Swedish EPA's environmental quality criteria can be used to assess whether data collected through the environmental monitoring programme indicates a possible risk to the ecosystem or to human health.

### **Air quality**

Atmospheric pollutants can cause illness and reduce human life expectancy. They also contribute to plant disease, corrosion, soiling, eutrophication, acidification and climate change.

## Air pollution has impacts on human health

Air pollution tends to be worse in urban than in rural areas due to motor traffic. The burning of wood for domestic heating purposes and in certain industries also impacts on air quality. Sweden is both an importer and an exporter of air pollutants, which are carried across national boundaries by the winds.

Particulates and ground-level ozone are the main air pollutants responsible for health problems today.

In recent decades air quality has been gradually improving as a result of new technology together with international conventions, agreements, laws and regulations. This improvement has gradually slowed down.

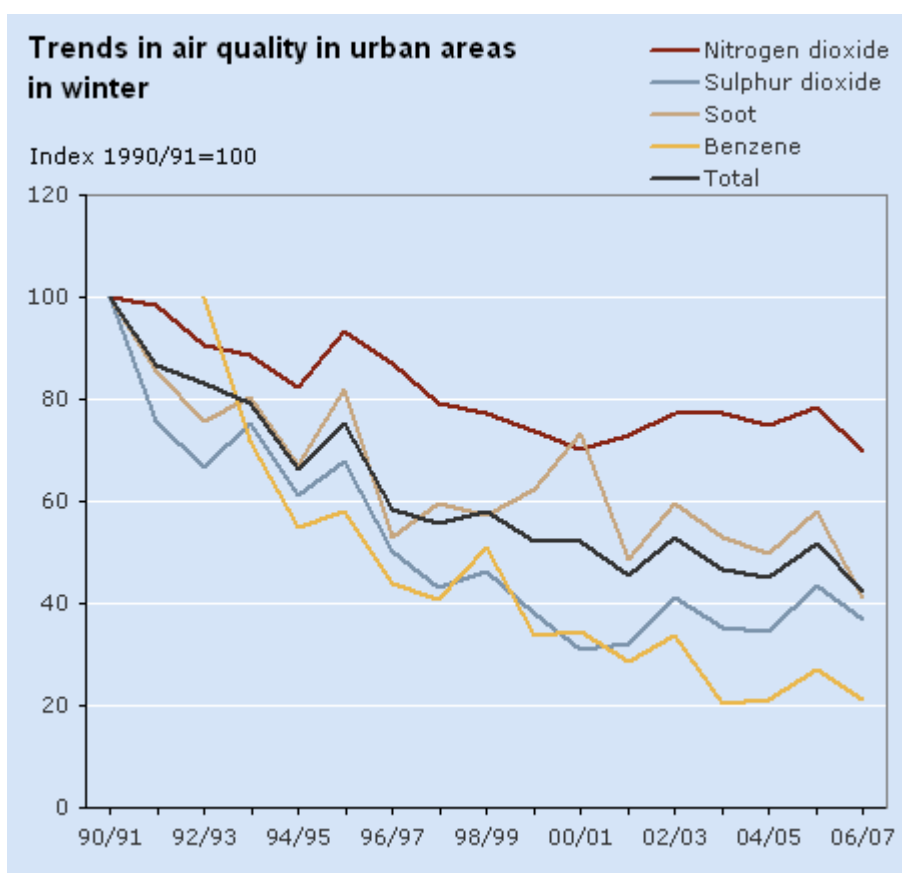


Fig. 2. Urban air quality.

Source: IVL Swedish Environmental Research Institute, National environmental monitoring (<http://www.ivl.se/>)

### Impacts on health

Urban air pollutants can cause or exacerbate cardiovascular disease, cancer, allergies, asthma and lung disease. The pollutants that are estimated to cause considerable health impact in Sweden are particulates and ground level ozone.

### Environmental pollutants

DDT, PCBs<sup>1</sup>, dioxins and similar toxic and persistent organic pollutants tend to accumulate in living organisms and can reach harmful levels, particularly in species at the top of food chains. Certain heavy metals are harmful to plants, animals and man, particularly mercury, cadmium and lead. They can be stored in living tissue and remain there for a very long time.

### **Toxic organic pollutants**

In the last hundred years humans have made and used tens of thousands of organic substances, often in large quantities. The first signs that some chemicals had become widely—if unintentionally—disseminated in the natural environment came at the end of the 1960s. Some of them were classified as toxic pollutants because animals exposed to them showed signs of damage or bad health.

We now know that many organic substances are serious health hazards, causing long-term damage to plants and animals. The greatest risks to animals and humans are from substances that persist in the natural environment or are stored in living tissues.

### **Heavy metals**

As a result of high mercury levels in the soil, pike and other freshwater fish now contain so much mercury as to be unfit for human consumption. Freshwater fish in many parts of the country contain mercury at approximately five times the estimated background level. The National Food Administration has therefore issued cost recommendations for certain types of fish.

Deposition of lead and cadmium has decreased significantly in recent decades. Mercury deposition has also decreased, but it is still far too high. Mercury, lead and cadmium are being withdrawn from use in Sweden, but other countries also need to reduce their use of these metals.

Other metals have less impact on the environment. The biggest problem is emissions from motor vehicles, which are still the source of far too much copper, zinc, chromium and nickel, among others.

\*According to the Swedish Environmental Protection Agency (<http://www.naturvardsverket.se/en/>)

### **Task**

*Answer the questions:*

1. Find the words in the text to describe diagrams and graphs.
2. Describe the graph in the text.
3. Answer the questions:

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<sup>1</sup> PCB (polychlorinated biphenyl) – полихлорированные дифенилы

- 3.1. If the air pollution has decreased in comparison with the end of 20th century? What are the reasons?
- 3.2 What diseases can cause urban air pollutants?
- 3.3 What are the main and most dangerous pollutants?
- 3.4 Why organic pollutants are very dangerous?
- 3.5 What hazard has mercury?