Air pollution

Air pollution kills millions of people annually and many more have to live with respiratory diseases that reduce their quality of life. The poor are more vulnerable, since they have to put up with poor housing and working conditions and live closer to pollution sources. Air pollution can decrease harvest yields, corrode materials, damage cultural artefacts and increase healthcare burdens – all of which have considerable economic effects.

Air pollution in developing countries originates from many sources, including:

- Small-scale energy production, such as domestic cooking and heating
- Large-scale electricity production in power plants fuelled by fossil fuels
- The transport sector, including two and three wheelers, cars, buses, vans and lorries, trains and ships
- Uncontrolled burning of wastes at dumps or elsewhere
- Large and small-scale industries
- Agricultural emissions, including smoke from bio-mass burning.

Key issues

Environment and health

Air pollution has harmful health and environmental effects at all levels, from the individual household to regional and even global scales.

Cooking and heating with open fires or stoves without chimneys leads to indoor air pollution. In poorly ventilated dwellings, indoor smoke can exceed acceptable outdoor air levels for small particles by a hundredfold. Exposure is particularly high among women and children, who spend the most time near the hearth. Indoor air pollution is responsible for the death of 1.6 million people annually. That's one death every 20 seconds.

PHOTO: SARA STENAHMMAR

Hanoi, Vietnam. Asthma and other respiratory diseases are exacerbated by air pollution.

Urban air pollution – of which a significant proportion is generated by vehicles, as well as industry and energy production – is estimated to kill some 800,000 people annually. Many cities in the developing world face very severe levels of urban air pollution – higher than in the developed world. However, in some Asian cities air pollutant levels have decreased, chiefly due to regulations regarding fuel use and vehicle standards.

Air pollution causes respiratory diseases, prevalent among the whole population, but affecting the poor the most, since they are more exposed and often do not have access to adequate health care. Air pollution causes considerable costs to the health sector.

Pollution is transported in the atmosphere and can spread with the winds to other regions or countries, often hundreds of kilometres from the source.

Pollutants also cause large economic losses through material corrosion, and can harm crops and natural ecosystems over wide areas. Gaseous pollutants reduce both the crop yields and the nutritional content. Acidified soils and lakes can cause loss of fish and other species and eutrophication by nitrogen can reduce biodiversity of sensitive ecosystems. These effects build up over long periods and recovery – when possible – takes even longer.

The major sources of air pollutants are also sources of gases that contribute to climate change, which is a major global challenge.

Social aspects

Air pollution exacerbates poverty. Many poor people suffer from air pollution because they live and work close to the streets and vehicle exhaust. Asthma and other respiratory diseases are exacerbated by air pollution and may impair the afflicted person's ability to work.

Some poor people live on waste dumps and make an earning from sorting and selling waste items. The presence of hazardous waste and the smoke from burning waste poses serious health risks.

Reducing air pollution exposure is necessary to reach the UN Millennium Development Goals related to improved health, mortality and environmental sustainability.

Institutional aspects

National air quality standards might exist, but the responsible authority does not have the resources to undertake effective action, or the responsibility may be split among several authorities.

There might be a local authority responsible for air quality management, but it seldom has resources to enforce air quality standards. At the city level, health, transport and city planning departments should work closely together in order to achieve results, but in reality they seldom do.

There is a need to standardize monitoring and assessment and for building capacity in the institutions to carry out these tasks.

Corruption is an issue for enforcement of regulations and bribery is sometimes a more attractive alternative to paying a fine or taking action.

Strategic areas for support

Within air pollution management the following areas are important:

- Capacity development at all governmental levels, including the promotion of regional approaches, assessment of air pollution including emission inventories, modelling, monitoring, health and other environmental effects
- Capacity building for mitigation measures and their costs, development of fiscal and regulatory measures and their implementation
- Capacity building for physical planning, land use management and use of tools such as environmental impact assessments
- Engaging relevant stakeholders, for example, industry should monitor their emissions and share the results with the public
- Other awareness-raising activities, for example, informing policy makers, the public and the educational sector
- International cooperation and networking on science, monitoring and policy development, for example, twinning between cities in developing countries with different skill levels
- Promoting the prevention of air pollutants by supporting efforts for energy efficiency, use of renewable energy and use of cleaner fuels and vehicles.

POLLUTANTS AND HARMFUL EMISSIONS

Oxides of nitrogen and sulphur (NOX, SOX) may cause acidification and eutrophication – harmful to health (mainly the respiratory system), materials, cultural artefacts, vegetation and crops.

Organic compounds such as solvents and polycyclic aromatic hydrocarbons (PAH), some of which are carcinogenic

Small particulate matter affects the respiratory system and causes heart diseases.

Ozone depleting substances (ODS) diminish the high-level ozone layer that protects us from harmful ultraviolet radiation.

Persistent Organic Pollutants (POPs) – pesticide residues, industrial chemicals and dioxins – can be transported widely by winds and seriously damage health.

Heavy metals emitted from industries and power plants, such as mercury, can affect health and ecosystems.

In addition, some pollutants react with each other, forming **secondary pollutants**. Ground-level ozone has such negative impacts on health, crops and materials.

To be aware of

In order to successfully address air pollution in developing countries, it is necessary to provide support in the long term, since building capacity usually progresses step by step. The development of a regional science base is an important aspect in convincing policy makers of the need to take action. Addressing air pollution needs to involve many sectors including the energy, transport, industry, construction and agricultural sectors.

The capacity to deal with air pollution has been improved in some developing countries and they can be used as benchmarks.

Where equipment is purchased for monitoring of air quality, for example, it should be appropriate to the institution where it is introduced. The maintenance and servicing of instruments need to be considered when choosing equipment. Instruments might not be used because of operational difficulties, costly consumables or spare parts.

Examples of Sida support

■ Sida supports Regional Air Pollution in Developing Countries Programme, (RAPIDC), which focuses on South Asia and Southern Africa. RAPIDC facilitates the development of agreements or protocols and helps implement measures that prevent and control air pollution through promoting international cooperation and developing scientific information for the policy process.

■ Sida has supported development of air quality management systems in the cities of Qindau, China, St Petersburg, Russia and in some cities in Peru.

Swedish resources

There is considerable expertise in Sweden regarding air pollution work at local, national and regional levels. It includes air quality monitoring, modelling, effect assessment and mitigation options.

Sida references

Available at www.sida.se

Fighting Poverty in an Urban World, Sida Policy (2006)

Urban Issue Paper on Chemicals Management

Urban Issue Paper on Industrial Environment

Urban Issue Paper on Public Environmental Management

Urban Issue Paper on Urban Solid Waste Management

Urban Issue Paper on Urban Transport

Climate and Development, Sida's position (2004)

Published separately

Tannerfeldt, G and Ljung, P (2006) *More Urban – Less Poor, An introduction to urban development and management,* London, Earthscan

REMINDERS

- ☐ What laws on air pollution and air quality standards exist and are they enforced? If not, what are the reasons?
- ☐ Are there institutional arrangements and responsibilities at national and local levels?
- ☐ Is there stakeholder involvement and public awareness?
- ☐ Is there cooperation between different authorities at national, sub-national and local levels?
- ☐ What is known about pollution levels? Are baseline studies available?
- ☐ Are air quality management tools and capabilities available, such as techniques for monitoring of relevant pollutants, emission inventories, transport models, effect models, and mitigation options?
- ☐ Are countries sufficiently interested in developing regional agreements or protocols on reduction of air pollution?

SIDA29152en

Sida
SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
SE-105 25 Stockholm • Visits: Valhallavägen 191 • Tel: +46 8 698 50 00 • www.sida.se • sida@sida.se
Urban Division: urban@sida.se • www.sida.se/urban