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LIECHTENSTEIN

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Policies concerning acidification and national research programmes related to those policies

Healthy forests are of existential importance for the survival of the population in the alpine country of Liechtenstein.
That is why, within the frame of the current "Healthy Forest" (GEWA) programme of investigation, extending over the years 1984 - 1990 the Government instructed the State Forestry Office in November 1983,

- to keep a continuous record of the effects of air pollution on the state of health of the entire Liechtenstein forest, to evaluate these records and to state in advance whether there is a possibility of an increased danger of infestation by secondary pests;

- to analyse the significance of air pollution with respect to damage to the forest and to propose measures for reducing air pollution which would be effective as far as the forest is concerned;

- to investigate the condition and the changes in condition of the forest soil, to evaluate these changes and to create the preconditions, related to the knowledge available, for the specialized surface protection of severely damaged forest sites.

Since that time in a 10-point-programme the following data are collected in order to determine the extent and progress of the damage:

1) - At commune level yearly data collecting by questionnaires concerning the forest damage situation by the Local Forest Authority;

2) - six-monthly damage response of individually marked trees in permanently observed surfaces in order objectively to evaluate the development and the rate of advance of phytophathological events;

3) - periodic survey of forest damage in a country-wide, permanent random sample network with simultaneous survey of forest inventory data;

4) - periodic country-wide survey and evaluation of forest damage with infra-red colour photographs taken from the air in the scale 1 : 10'000;

5) - yearly survey and evaluation of forest damage on a selected area in order objectively to know the development of the forest damage with infra-red photographs taken from the air in the scale 1 : 3'000;

6) - annually recording of the sulphur content of spruce needles since 1973, by means of a country-wide, permanent network of random tests;

7) - periodic soil analysis by means of a country-wide, permanent network of random tests (macroelements, essential micronutrients, trace and heavy metals (essential and toxic elements), etc., analysed in at least two extracts: water soluble and exchangeable); physical parameters; organic matter; availability of nutrients. Analysis of residues after use of herbicides and pesticides;

8) - measurement of air pollution by means of a permanent measuring station and a mobile measuring station in selected areas of the Liechtenstein forest, always during the course of a year. Besides meteorological data the following values are recorded: SO_2, NO, NO_2, CO, O_3, suspended dust (total dust quantity - PB lead and Cd) also deposited dust (total dust quantity - Pb and Cd). The pH value, ammonium, K, Ca and Mg as cations, sulphate, nitrate and chloride as anions are determined from acid rain;

9) - periodical examination of the livers and kidneys of mice, hare, roe deer and chamois with reference to Pb and Cd;

10) - various other investigations.

The results accumulated so far within the scope of this programme caused a number of countermeasures to be introduced, with shortterm or long-term effects. And although they are similar to the ones, my friend from Switzerland has spoken about, I repeat some of them again, because it is so refreshing to hear about progress in the environmental field:

- The putting into force of a new clean-air law in Parliament, in the autumn of 1985, as an effective weapon in the fight against air pollution on a broad basis. The limit values going to be determined by ordinance, for emissions as well as for immissions, aim to be the strictest standards valid in Europe;

- the prohibition since the 1.1.1986, of the use of "heavy" and "medium" grade oil for heating or industrial purposes: The sulfur content of the oil used now has to be below 0.3 %, so SO_2-emissions have been reduced more than 50 % in a few years;

- the installation of a country-wide supply grid for natural gas, for the larger business and industrial premises by the end of 1986, in the first instance;

- the complete tax exemption for all motor vehicles equipped with three-way catalytic converters till 1989;

- the availability of lead-free petrol at more than 95 % of all petrol stations at a comparably lower price;

- the general introduction of speed limits of 50 km/h in built up areas and 80 km/h elsewhere from 1.1.1985;

- the introduction and application of US-83 exhaust-gas standards by the 1.10.1987 for private cars and by the 1.10.1988 for light commercial vehicles (delivery vans, small buses);

- the ratification of the ECE-UNO Agreement dated the 13th November, 1979, concerning long-range transfrontier air pollution and within the frame of this Agreement;

- from autumn 1986 participation in the programme concerned with co-operation in the measurement and evaluation of the long-range transmission of air polluting substances in Europe (EMEP), also

- the signing and ratification of the declaration of intent dated the 9th July, 1985, in Helsinki, concerning the reduction in the emission of sulphur by 30 % (related to 1980) by 1993/95.

- The obligatory annual carrying out of exhaust-gas checks since 1986;

- the considerable reduction in public transport fares and the availability of cheap season tickets;

- the holding of two motor-vehicle-free sundays in April and September, 1985 in order to enlarge the public awareness for air pollution problems;

- the information and advice to the public;

- the promotion of effective refuse-disposal planning (sorting/composting) in order to minimize waste-combustions problems;

- the introduction of exhaust-gas regulations for heavy vehicles (lorries, articulated lorries, coaches and caravans) and also introduction of stricter standards for motorcycles and mopeds are visualized for the 1.10.1987 in a 1st stage.

Whereas, owing to the introduction of a number of measures, the emission of SO_2 has declined noticeably since the beginning of the nineteen-eighties, the concentrations of NO_x and hydrocarbons remain unchanged. Accordingly, ozone's outstanding significance as an air pollutant at the present time will increase.

Government measures must therefore be aimed primarily towards the drastic reduction of NO_x and hydrocarbon emissions.

As we try to do our homework as well and as fast as possible as regards taking countermeasures against air pollution, we expect the same from all the other countries. Air is our common resource and that means, that nobody can claim justification to live at the costs of his neighbour or the future generations.

And with cordial thanks to the hosting country for having organized this important conference I like to come to an end by saying that the common ressource "air" needs common action. And as the state of air pollution presents itself now, immediate and incisive action is necessary.