

### Acid showers : disturbing present and alarming future

There was a hue and cry about acid rain many years ago, which gradually died down as new, more pressing, problems took pushed it into the background – the usual fate of almost all headlines-grabbing items. Unfortunately, however, the problem did not go away. In fact, as described in detail by Manju Mohan and Sanjay Kumar on p. XXX of this issue, over the years, the rainwater seems to have been steadily becoming more and more acidic.

There is neither a mystery nor any controversy (hopefully!) about what causes acid rain. The oxides of sulfur and nitrogen are the main factors, while organic acids and to an extent hydrochloric acid also contributes to it. The sources of these gases are also well-known: industrial emissions, coal-based thermal power plants, petrol and diesel burning vehicles generally head the list. Occasionally, Nature also lends a mighty hand in the form of volcanic eruptions. Fortunately, however, these are rare in India as of now.

By examining the pH values of rain water recorded at many places in India (Jodhpur to Minicoy and Srinagar to Kodaikanal), Manju Mohan and Sanjay Kumar have pointed out that there is an increasing trend towards acidification almost all over the country. More disturbingly, acid rain has been reported at places like Kodaikanal and Port Blair (in addition to Nagpur and Mohabani) – showing that the places where the effect is felt can be very far from the places where gases are emitted (another potential item for inter-state acrimony!).

A somewhat positive feature emerging from the compilation of world-wide figures is that India is much better off compared to many of the other (even European) countries as far as acid rain situation is concerned. Nature has again been kind to India. The alkaline soils offset the effects of acid rain to an extent, and the sand-storms originating in the Thar desert do their part by increasing the pH of the water in the clouds.

With industry, power-plants and traffic as the major offenders, it goes without saying that acid rain can be labeled as an inevitable consequence of development. Looking at the pace of developments during the last few decades, it is only to be expected that acids will become stronger and stronger. Using a sophisticated simulation model, Manju Mohan and Sanjay Kumar have attempted to project the acid rain potential over the next many decades at many locations in India, and have identified a few places where the situation can become critical. They also discuss (see page XXX), on what can be done to prevent, or at least, to mitigate, these problems. In one sense, the steps are very similar to (in fact, exactly the ones) those needed for cutting down overall pollution levels – so one hopes that they will be taken sooner or later. If not, the damage may be far, far, higher than what one imagines. It is like very small doses of poison being administered very regularly over long times; it does not grab as much attention as a slap, blow or a kick – but the results are certainly more disastrous.

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