

In this issue

Changing tropospheric temperature trends

The anthropogenic emissions of gaseous and particulate pollutants are increasing due to increase in the industrial and agricultural activities related to development. Some of these gaseous pollutants are also greenhouse gases like CO₂, CH₄, etc., which change the radiation balance of the atmosphere leading to climate change. The developmental activities are at a faster pace in the Asian region particularly in India and China. Atmospheric air temperature, one of the key parameters to study climate change, is being measured daily by the India Meteorological Department from many airports in India. There have been studies related to change in air temperature at the surface level but there are very limited studies related to temperature changes in the free troposphere.

In this issue (see **page 637**), radiosonde data over two megacities in the Indo-Gangetic Plain, viz. Delhi and Kolkata are examined to investigate the long-term trends in air temperature at various pressure levels between 850 and 150 hPa during 1973–2008. An attempt is made to reconcile the observed long-term vertical temperature trends with our understanding of the causes of these changes. The trends over these highly polluted megacities have been quantified on an annual and seasonal basis, and explained in the perspective of meteorology, dynamics and other effects. The important point, which has emerged from this study, is that there has been an accelerated rise in temperatures during 1973–2008 when compared with a previous study which reported negative trends during

earlier period, i.e. 1958–1985. The article is aimed at using the extensive radiosonde database over the Indian region as an informational tool to address the key question of tropospheric warming and hence climate change over this part of the world.

White-bellied Shortwing of the Western Ghats

Conducting simple biological studies on field are riddled with their own mysteries. In this issue, Robin *et al.* (**page 676**) discuss how knowing the sex of an individual has important consequences for studying the demography of a species, especially when it is a threatened, endemic bird like the White-bellied Shortwing of the Western Ghats mountains. The authors detail how identifying the sex of an individual bird was impossible in the field. There is also confusion in the literature about how different morphological characters can differentiate between the sexes in this species. They used genetic markers to identify sexes of a subset of individuals captured during their study. With this information they built a model to discriminate between the sexes using the morphological measurements collected for all the individuals. This combination of molecular and morphometric tools allowed them to predict the sex of most of the study individuals. Finally, with these modern tools, they were able to corroborate the keen observations of early ornithologists, Salim Ali and Dillon Ripley, who pointed out that the sexes of this species differed in wing length. The authors, in turn, show how tarsus length can additionally contribute to differentiating between the sexes,

thus providing important baseline information that can be used for future scientific explorations and conservation of the species.

Renewable energy sources and India's energy needs

At present coal and natural gas are the major sources for electricity production in India (about 80%). The remaining energy needs are met with renewable energy sources including biomass, wind, hydro and nuclear. Among renewable energy, hydroelectric power is the biggest contributor. India is on its way to harnessing more of renewable energy with the National Solar Mission already in place. But it has its own set of drawbacks, particularly the non-availability of uncultivated land for installing solar power plants. Similarly there are drawbacks associated with tapping more of other forms of renewable energy. In this regard, S. P. Sukhatme (**page 624**) asks a timely question, 'Can renewable energy sources eventually supply India's electricity needs in the future?'

Sukhatme suggests that with a huge population, limited energy resources and associated environmental issues India needs to plan a simple lifestyle. Considering these limitations it is unlikely that the residents will be supplied with plenty of electricity in the future. A frugal per capita provision of 2000 kWh annually thus seems the only way to ensure sustainable development. After estimating the population and the potential of renewable energy sources, he comes to a conclusion that renewable energy sources alone will not be able to meet the burgeoning energy demands of the country.