In this issue

Allocation for Research

Economics of science

A General Article in this issue by Chinese researchers presents a dilemma that other developing nations will have to face sooner or later. China, in the recent decades, has seen an increase in the outlay for scientific research and the increase in the research output has been phenomenal. Now the issue is of budget allocation: where should China invest? In a few big science programmes or many small science projects?

Big science became politically attractive because of the success of the Manhattan project which played a decisive role in World War II. The Apollo Project, Large Hadron Collider, Hubble Space Telescope, etc. followed soon, some with international collaborations. However, the return of investment in big science – in terms of the knowledge produced, technological, industrial, social, cultural and other spill-over impacts – may not measure up to the many small science projects with the same investment, the researchers point out. They provide a comparative study to demonstrate the point.

Should we let a thousand flowers bloom? Or should we limit ourselves to a few beautiful lotuses in a pond? On **page 479** in this issue, read the decision making tips for policymakers confronted with the issue of allocation for research.

Tree Cavities as Home

Indian vertebrates

Tree cavities host a wide variety of creatures. Some, like woodpeckers, make their own cavities while some others modify existing cavities for their own purposes. But the majority depend on available cavities.

Studies on tree cavity dwellers in India are scant. A Review Article by researchers with the support of three different organisations in India examines 254 papers relevant to the issue. So far, 517 cavity dweller species have been identified. After summarising the information in the papers, the review delineates the gaps in research and the need for habitat management strategies for the conservation of the tree cavity dwellers.

Foresters, forestry students and researchers as well as curious citizen scientists may like to flip to **page 490** in this issue.

Land Degradation in India

Focus on critical districts

Land gets degraded by water, wind, glaciers, and for other natural reasons. Human activities often add to the woes. With increase in population pressure, therefore, land degradation should increase, at least theoretically. Yet, degraded lands have actually decreased in India during the decade, between 2005–06 and 2015–16, say researchers from the National Remote Sensing Centre, ISRO.

Armed with hundreds of satellite images each of summer, winter and rainy seasons, they sought help from other organisations in India to anchor the satellite data to ground realities. Total degraded lands in India, they found, shrank by nine lakh hectares in the decade. This improvement is attributed to better watershed and land-use management practices.

This overall picture of marginal decrease in degraded land area in India is offset by rapid land degradation in many places. The researchers examine reasons and spell out factors and issues facing those states in a Research Article in this issue. The district level characterisation of land degradation will help district and state administration take focused and timely action to save available land from degradation and to restore degraded lands. Turn to **page 539**.

Transmission Line Towers

Failure due to sandstorms

Towers that support transmission lines for electricity often collapse due to dust storms, a regular meteorological event in Rajasthan, Haryana, Punjab, Delhi and UP during summer. While the collapse of towers supporting 220 kilovolt electric lines cuts off electric supply locally, the failure of towers that carry 400 or 765 kilovolts spells darkness for larger areas. And often, the failure of one tower has a domino effect on nearby towers.

In this issue, engineering researchers in Chennai and Visakhapatnam analyse this problem to find solutions. The towers are designed considering their resistance to wind load, they point out. But when sand particles are suspended in the wind, an additional load is created.

Using numerical analysis and simulating sandstorms in wind tunnels, they examine the behaviour of towers that carry 765 kilovolt electric lines. The failure rate, they find, is much higher in suspension than in tension-type towers. The engineers in south east India suggest ways to reduce chances of electric transmission tower failure in northwest India in a Research Article on **page 511**.

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