In this issue

Farmer Producer Organisations
One district, one product

More than 80% of the farmers in India are categorised as small and marginal. Low income and no capital force them to continue using low level technology. Low market efficiency and low bargaining power puts them at risk for monopolistic exploitation. This is a situation that farmer producer organisations and farmer producer companies can help overcome. At present, there are more than 5000 of them in India, and the numbers are growing rapidly.

A General Article in this issue examines the status of farmer producer organisations in Bihar, the diversity of their produce and the success stories of collective efforts in marketing. The analysis of produce such as mangoes, litchi, makhana and banana suggests the potential of earning large foreign exchange, besides improving farmers' income substantially. To make this potential a reality, the authors suggest strengthening farmer producer organisations based on the One District, One Product scheme of the government.

Based on the analysis of the strengths, weaknesses, opportunities and threats faced by farmer producer organisations, the article on **page 614** spells out the strategies for strengthening farmer producer organisations from the perspective of achieving the aims of the One District, One Product scheme.

Chemistry and Theatre
Carl Djerassi's contribution

Carl Djerassi, a Bulgarian born in Austria a hundred years ago, became a prolific American chemist with more than 1200 publications. His scientific contributions to the synthesis of various steroids are well-known to chemists. But, to the public, he is better known as the father of the contraceptive pill.

In spite of his phenomenal rise in the hierarchy of American academia, he was equally active in the pharmaceutical industry and even set up his own company as an entrepreneur. As if that were not enough, he was a collector of art, wrote poetry, plays and novels. His insights into 'science in fiction' – as opposed to science fiction – provided creative impetus to many science communicators.

Now, about eight years after his death, researchers from IISER Mohali provide us with an analysis of Carl Djerassi's vision of chemistry in theatre, the distinction he makes between theatre for the page and theatre for the stage as well as the methods that he uses as a playwright, with examples from two of his plays.

For scientists who have a morbid fear of crossing the imaginary gulf between the 'two cultures' of the arts and the sciences, the General Article on **page 608** is a long-awaited treat(ment).

Long-term Ecological Monitoring
Status of Indian Himalayas

To understand the patterns of long-term changes in ecosystems and to help us predict ecosystem responses to various phenomena, we need data. So most countries of the world have started setting up permanent monitoring plots and systems for rigorous observations. What is the status of long-term ecological monitoring and observations in India, especially in the fragile ecosystems of the Indian Himalayas?

Researchers from the G.B. Pant National Institute of Himalayan Environment provide an overview of globally available literature on the topic, narrowing it down to provide a gist of Indian contributions and moving on to focus on the literature available on the long-term monitoring of Himalayan ecosystems.

Though there has been a gradual increase in the number of publications on the subject, in terms of the coverage of various ecosystems, literature is highly limited and skewed. The Review Article spells out the huge lacunae of research on the topic and provides recommendations to overcome them.

Turn to **page 623** for details.

Seismic Effects on Structures
Real-time hybrid simulation

To simulate the effects of earthquakes on manmade structures, a building can be constructed on top of a shake table. But that is extremely expensive. In hybrid simulation, a part of the simulation is achieved by numerical methods. Though this can be done for longer durations and reduces expenses, it is applicable to structures that are independent of the loading-rate of strains. Real-time hybrid simulation can deal with structures that are dependent on loading rates as most structures are and in the actual time scales of earthquakes.

In 2019, IIT Kanpur had constructed a Pseudo-Dynamic Testing Facility without shake table, where full scale structural models can be tested. Now the facility has been upgraded for real-time hybrid simulation.

In a Research Communication on **page 685** in this issue, the researchers provide the details of the upgrade and its application to the seismic response simulation of a two-storey reinforced concrete building with special moment resisting frame and nonlinear viscoelastic dampers.

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