

## In this issue

### Energy Transition Policies

#### *A long-term perspective*

As a developing economy, India is facing a desperate demand for more electricity. More than half the electricity generated is from fossil fuels. And electricity generation from fossil fuels needs curtailing to achieve the target of net-zero carbon emissions by 2070.

A Review Article by R. B. Grover, Homi Bhabha National Institute, Mumbai examines the challenges in policy making to achieve a balance between the present national demand and international commitments. He estimates the electricity demand to meet development aspirations to be about 24,000 billion kWh per annum in 2070, but points out that today it is only 1600 billion kWh from all sources. Though the renewable energy sector is growing, the growth in demand necessitates more coal-powered plants.

The article on **page 1309** in this issue, reviews the technological options available and makes strategic recommendations for policies needed to reconcile the energy transition to zero emission with the burgeoning demand for energy.

### Drug Discovery in India

#### *Predictive medicine*

Non-communicable diseases vary widely from person to person. The rapid advances in genomics, transcriptomics, proteomics and metabolomics are generating a large amount of data on the disease networks involved. The generation of data on microbiomes is also keeping pace. Thankfully, computational biology, bioinformatics, artificial intelligence algorithms that can help identify useful patterns are also developing side by side. Such advances are leading to patient-centric differential diagnoses of diseases.

Meanwhile *in silico* studies are making it possible to predict potential molecules targeting specific nodes of the disease networks. Thus, instead of the one-size-fits-all approach to diagnosis and treatment, a more individualised treatment is becoming possible.

A Review Article on **page 1317** reviews international developments and examines

opportunities and challenges for drug discovery and predictive medicine in India.

### Rhizosphere of Tartary Buckwheat

#### *Bacterial and fungal diversity*

Tartary buckwheat is cultivated in mountainous terrains, where water is a limiting factor. Mulching with plastic films is a useful method to retain soil moisture. The possibilities are mulching the whole ground or creating ridges and furrows and mulching only the ridges, allowing water to collect and percolate in furrows.

But these techniques would change the rhizosphere of the crop. Chinese researchers recently compared the differences in the rhizosphere of Tartary buckwheat grown under three cultivating strategies: regular cultivation, plastic film mulch and furrow-ridge mulch. They isolated soil microbial DNA and sequenced it to assess microbial diversity and community.

Though the microbial diversity showed a difference under mulching, the alteration in the microbial community structure was even more remarkable and relevant.

Plastic film mulch increases soil temperature and moisture – two factors that can improve crop productivity. But these factors also facilitate fungal growth and mycotoxin production. This increases the risk of fungal epidemics, warn the authors of the Research Article on **page 1365** in this issue.

### Sāncipāt Manuscripts

#### *The secret of survival*

Sāncipāt, made from the bark of the Sānci tree, was popular material for writing manuscripts, at least from the 6th to the 20th century in Assam. How did the manuscripts survive in the hot and humid conditions of the region, so conducive to fungal diversity and the destruction of the cellulose-based material? A Research Article in this issue, by researchers from the Tezpur University explains the mystery.

They followed the steps in the traditional methods to prepare a Sāncipāt folio. They also investigated the physical and chemical properties of the materials used as well as the folio that was prepared.

Thus, they laid bare clues to the strength, gloss and resistance of Sāncipāt manuscripts against fungal attack.

Read from **page 1359** in this issue to find those clues, which may help conserve ancient manuscripts, even those based on other cellulose-based materials.

### Indian Trawl Fisheries

#### *Update on bycatch*

Introducing mechanised boats with nets for bottom trawling had severe consequences on marine benthic flora and fauna. The bycatch which could not be sold was also high.

But many species considered bycatch decades ago have become welcome additions to the edible range. Bottom trawlers are being replaced by faster boats that can harvest pelagic fauna. The establishment of factories for extracting fish oil and for producing fish meal has created a market for another part of what was considered bycatch. The changing connotations of the word calls for a more refined vocabulary: low-value bycatch.

But meandering meanings of words cannot question the impact of trawling on the marine food web as well as on the population dynamics of edible species harvested from marine environments. Annual trawl fishery production from the Indian economic zone has gone above more than two billion tonnes. The percentage of low-value bycatch that is either discarded from fishing boats or unsold after landing is significant, often reaching 50% or more in some locations. A more refined regulatory system for marine fishing is needed to make Indian fisheries sustainable.

A Research Article by a team of scientists from ICAR-CMFRI takes stock of the catch, the bycatch, the value chains as well as fishers' perceptions on existing regulatory systems at many locations all along the Indian coast. Indians who are even remotely associated with marine fisheries need to read the article on **page 1372** in this issue.

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