

## In this issue

### **Bhutan's Biodiversity** *Hotspot in a hot spot*

Bhutan lies in an Eastern Himalayan biodiversity hotspot. The geological diversity of the mountains that fold against the Asian plate generates meteorological diversity. And the region gets snow, rain from above and hot water springs from below, to amplify the diversity of life forms – many still waiting to be discovered and described. The importance of this landlocked country to the rest of the world is not merely the invention of the happiness index, but something more basic: it absorbs carbon emission four more times than it emits.

A General Article on **page 521** in this issue explores the benevolent biodiversity of Bhutan and examines the status of its Protected Areas, National Parks and corridors for wildlife, to highlight possible threats to the hotspot in the event of the predicted changes in climate.

Since Bhutan is now a democracy, it is left to the people to act – much easier than in India or China, its neighbours, since the population of Bhutan is only about 770,000.

### **Tropical Marine Fish Resources** *Do depleted stocks recover?*

Biodiversity on mountains is easily visible. But the biodiversity of oceans is not as easily appreciated. With the mechanization of fishing in the middle of the last century, and its adoption by not only fishermen but also richer entrepreneurs, overexploitation of fish resources became possible. But it was relatively unnoticed, except by a few scientists. However, rigorous documentation of the phenomenon led to the creation of several legal restrictions on fishing activities – besides the existing restrictions traditionally practiced by fishermen.

Later, increasing prosperity and consequent demands generated by changing consumption patterns, added to the woes created by mechanization. But sustainability demands conservation of depleting resources and thus monitoring of the 'catch' to detect threats of extinction of any particular species. Thankfully, there are only 47 common species of marine animals harvested for consumption. And

scientists have formulated methodologies to assess the fish stock from the data of catch.

In a Research Account on **page 584** in this issue, scientists from the Central Marine Fisheries Research Institute use the data from the South West coast of India, from 1971 to 2008, to examine the question: how much time does it take for different species that are depleted to recover? And to re-emerge from depleted to abundant status?

The catch in the study is that we have to depend on catch statistics to study marine population fluctuations of species. Of course, unlike ecological networks on land, organic networks under the sea are not easy to study. Moreover, despite the caveat, the results of the study are significant. Some species with short life cycles may recover quickly. But in some species recovery may take decades. This has implications on the management of marine resources, which, even within existing legal frameworks, is poor in India. Response to collapses of stock – for example, of the bottom dwellers threatened by trawling – takes time. Are the lessons learned from joint forest management applicable to the common resources under the sea?

### **Pancreatic Cancer Treatment** *Evaluating the armamentarium*

Pancreatic cancer is usually not detected early. By the time a physician encounters it in a patient, it would have grown. If it has not progressed to metastasis, surgical removal is an option. Laparoscopy has made removal of respectable borderline pancreatic cancer less traumatic for the patient. Since pancreatic cancer is known to be recalcitrant, medical practitioners use radio therapy as well as chemotherapy along with surgery. But chemotherapy and radiation therapy take their toll on the patient. What value do the adjuvant therapies provide? Does starting with chemotherapy to reduce the area of removal really work?

It is not feasible to use clinical trials to provide the data necessary to answer such questions. So scientists from Wuhan, China, tackle the problem using meta analysis of literature available. Digging through 50 years of published

information and evaluating the relevance of abstracts and papers for inclusion in the study by two independent reviewers led to more than 300 cases that help assess the effectiveness of preoperative neoadjuvant chemotherapy in improving the outcome.

Read the Research Article on **page 595** in this issue. The paper is so well constructed that other researchers would do well to emulate the style.

### **Voice to Speech to Language** *Automatic recognition delineate language families*

Humans, including musicians, are better at discerning small changes in pitch at low frequencies than they are at high frequencies. The Melody scale, or Mel scale, match more closely to what humans perceive. Such a physiologically adjusted frequency spectrum of sound is called ceptrum. The difference in physical audio spectrum and physiological ceptrum is relevant in the performance of voice recognition and even sex, age and emotions of the speaker. Automatic speaker identification has legal and forensic applications. Statistical methods to identify consonants and vowels have also evolved and thus speech recognition systems have made the stenographer's role redundant.

Every language has its own unique combinations of sounds. This clustering can also be automatically recognized and, therefore, techniques to identify languages have also been evolving for the last two decades. But the effort to identify Indian languages in order to initiate a comparative study of languages using these techniques is recent. These tools may help us identify and even measure the extent of mutual influences of neighbouring languages, as well the migration of dominant languages into far regions. These may prove to be useful techniques to corroborate the history and evolution of language families in India.

A Research Article from the Indian Institute of Technology, Kharagpur, evaluates alternative ways to do this on **page 667** in this issue.

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