

In this issue

Sweet Sorghum Syrup

Challenges for researchers

Sweet sorghum is a multipurpose and hardy crop, tolerant to a wide range of climatic and soil conditions. Its stalk produces sugar equivalent to that from sugarcane yet demands much less water. Besides highly nutritious grains, it yields leaves and bagasse that can be used as fodder. The antioxidants in the sugary syrup extracted from the stalk make it a nutraceutical with high shelf life. Since the syrup is sulphur free, the ethanol made from the syrup is considered superior in quality.

Yet, why is it that farmers in India do not shift from cultivating the water-guzzling sugarcane crop to sweet sorghum? Scientists from the Nimbkar Agricultural Research Institute, Phaltan investigate this issue in a General Article in this issue. In the process, they also spell out, in no uncertain terms, the areas that need research and development to make sweet sorghum more economical and acceptable to Indian farmers and thus make Indian agriculture more sustainable. Read on from **page 1901**.

Glaciers in Bhaga Basin

Estimating mass balance

Outside the polar region, the Himalayas contain the largest amount of freshwater, stored in glaciers that cover more than 25,000 square kilometres. This stored water sustains the lives of millions of people in the subcontinent through a vast network of rivers. The threat of looming climate change and signs of retreating glaciers demand that we estimate the mass balance of glaciers for evidence-based strategies for the sustainable use of water in the subcontinent.

The direct measurement of mass balance is difficult due to problems

of accessibility to the glaciers in mountainous terrains and the logistics involved. An alternative is the geodetic method which provides an indirect estimate, but with a gap of five to ten years. The satellite-based gravitational method is yet another alternative. However, it provides estimates of large areas, and is not suitable for estimating the mass balance of individual glaciers.

So when researchers wanted to estimate the mass balance of the glaciers in the Bhaga basin, they chose to leverage on the empirical relation between the surface mass balance and the accumulation area ratio to calculate mass balance. This method, they argue, can give the mass balance of individual glaciers with a high temporal resolution.

In a Research Article in this issue, they provide evidence for the usefulness of this method, based on a sample of five large and four small glaciers in the Bhaga basin. Read the details from **page 1961**.

Epidemics and Climate Change

Climatic conditions influence disease prevalence. India, primarily a tropical country, is a hot bed of infectious diseases. If the climate changes as predicted, will we be prone to more epidemics of emerging and re-emerging infections?

A scoping review from researchers at the Azim Premji University investigates the gaps in our knowledge and the implications for policy makers and healthcare systems in the country.

Read the Review Article on **page 1919** in this issue for more.

Vermiculated Sailfin Catfish

Exotic alien in lower Ganga

A Research Article in this issue by scientists from the ICAR-Central

Inland Fisheries Research Institute point out that the problem of the exotic alien introduced through aquarium trade into the River Ganga has now extended to the lower reaches of the river in West Bengal. Vermiculated sailfin catfish populations have established themselves in the Bhagirathi–Hooghly river system and are slowly encroaching into inland water bodies as well. The competition between the exotic fish and native edible fish has already started creating problems for fishermen. Unless concerted communication for action is taken to apprise both aquarium enthusiasts and fishermen, the problem may be exacerbated, point out the scientists. Read on from **page 2006**.

Savonius Wind Turbine

Geometry, operating parameters

The Savonius turbine is one of the simplest designs for wind turbines: two or three scoops mounted on a vertical turbine axis. The curvature of the scoops makes it easy for them to move in the direction of the wind and the drag is less in the opposite direction. Since it is the differential drag that generates the motion, the energy production efficiency may not be as good as what is produced by conventional horizontal axis turbines used in wind farms. However, it is best suited for rooftop energy harvesting systems.

In a Research Article on **page 1927** in this issue, engineers from the Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram present a two-dimensional numerical study on the parameters to identify the configuration that provides the best performance.

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