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Economic impact assessment of AAS of India

Weather forecasts in all temporal ranges are desirable for effective planning and management of agricultural practices. The National Centre for Medium Range Weather Forecasting (NCMRWF) under the Ministry of Earth Sciences (MoES) had been providing Agrometeorological Advisory Services (AAS) at the scale of agro-climatic zone to the farming community based on location-specific Medium Range Weather Forecast. Since 2007, the entire framework of AAS has been relocated at the India Meteorological Department (IMD) under MoES for extending the service (in operational mode) to the districts under these agro-climatic zones. The impact of the weather-based AAS in terms of economic gain/loss was reported by the AAS units on several occasions. But these were sporadic cases and could not be inter-compared mainly due to non-uniform use of the methodology.

A pilot study was conducted to assess the economic impact of weather forecast-based advisories. Maini and Rathore (**page 1296**) describe about the study undertaken in 15 representative units by NCMRWF covering principal crops (cereal, millets, fruits and vegetables, oil seeds, cash crops). Six seasons comprising of 3 Kharif (summer) and 3 Rabi (winter) seasons during 2003–2007 were chosen. The sample set consisted of 80 farmers comprising of 40 responding and 40 non-responding farmers.

The results in quantitative terms show that the AAS farmers accrued a net benefit of 10–15% in the overall yield and a reduction by 2–5% in cost of cultivation over the non-AAS farmers. The AAS helped in bringing out substantial awareness among farmers about adoption of weather-based advisories, their timely availability and quality of service. It also helped in encouraging adoption and use of modern agricultural production technologies and practices.

The AAS program of MoES is an innovative inter-departmental extension service, with a goal to deliver weather-wise management of agriculture. Although initial evaluation of AAS has been quite favourable, these evaluations have been quantitative in nature and are based on descriptive analyses of results of structured surveys. The success of the survey presented in this study gives an impetus to carry out similar studies in other user sectors of meteorological services such as aviation, power, etc.

Enhancing corrosion and biofouling resistances

The wetting behaviour of solid surfaces by a liquid is a well known aspect of surface chemistry. When a liquid droplet contacts a solid substrate, it will either remain as a droplet or spread out on the surface to form a thin liquid film, a property normally characterized using contact angle (CA) measurements. For a solid substrate, when CA of water or oil on it is larger than 150°, it is called superhydrophobic; water drops simply bounce-off the surface. On the other hand, when CA of water on a surface is almost 0°, it is called superhydrophilic. Superhydrophobicity is an interesting multi-disciplinary topic that covers biology, materials science, chemistry and physics. In nature, the leaves of plants like *Nelumbo nucifera*, *Colocasia esculenta*, *Brassica oleracea*, the wings of butterflies and the legs of water striders are all superhydrophobic. The lotus leaf appears to have a smooth surface consisting of micro–nano epidermal structures. Moreover, they are often covered with tiny wax crystals of size a few hundred nanometers. The combination of micro and nanostructures, together with a hydrophobic chemistry, generates the phenomenon of superhydrophobicity in lotus leaf with water droplets on such surfaces exhibiting CA above 150°. Recently, much interest has been directed towards fabrication of biomimetic superhydrophobic surfaces because of their potential applications in self-cleaning glasses, non-wetting clothes, corrosion protection coatings, anti-snow sticking and monument protection. Mahalakshmi *et al.* (**page 1328**) report the development of superhydrophobic titanium and hydrophobic 9Cr1-Mo steel surfaces by anodization or etching followed by dip coating of low surface energy compound motivated by the lotus effect. The corrosion performance and anti-biofouling properties are ascertained using electrochemical impedance spectroscopy and epifluorescence microscopy. The study reveals enhanced corrosion resistance and anti-biofouling of the materials after superhydrophobic surface modification.

Biodiversity value of *Soppinabetta* forests

The importance of managed forests (e.g. sacred groves and *Soppinabetta* forests) and production landscapes (e.g. coffee agroforestes and cacao plantations) in conserving biodiversity, ecosystem structure and services has been increased by the accelerating and drastic decline of primary and continuous forests, which are mostly come under the umbrella of protected forests. Sinu *et al.* (**page 1337**) have studied the biodiversity value of the farmer-managed *Soppinabetta* forests by studying the epiphytic orchid diversity inside it. In order to understand how the orchid composition and diversity are modified by the intensity of human dependence, the study compared the *Soppinabetta* forests that receive two degrees of management with the state-protected reserve forests of the region. The study found that the *Soppinabetta* forests are at par with the state-owned protected forests of the region in conserving epiphytic orchids and have immense importance in maintaining the population structure in the fragmented landscape. Although the alpha diversity is maintained in the degraded *Soppinabetta* forests when compared to the sustained *Soppinabetta* forests, the compositional shift in the species was noticed. This indicates that epiphytic orchids respond to the ecosystem processes like fragmentation. The study suggests that *Soppinabetta* forests of the Western Ghats provide an apt example of reconciliation ecology and should get special attention in conservation planning with the inclusion of local peoples.