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Predicting monthly rainfall over India using SST

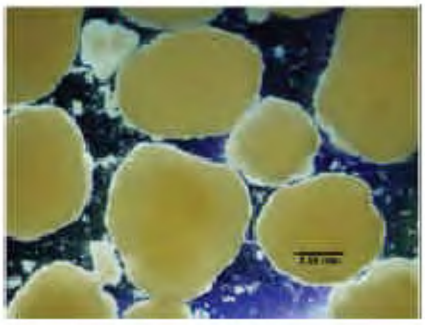
IMD developed a model to predict July rainfall using 8 parameters and this was not possible for other months (June, August and September). Sadhuram (**page 425**) reports the possibility of predicting monthly and seasonal (June–September) rainfall over India during SW monsoon season using only SST. SST in the northeast Arabian Sea during winter (December–February) and central Equatorial Indian Ocean during fall (September–November) of the previous year are identified as the potential predictors. The SST indices, AS + CEO1 and CEO2 for the periods 1978–93 (I) and 1978–98 (II) are positively and significantly correlated with the monthly and seasonal rainfall except June. Hence, the rainfall during June is indirectly estimated. There is a close agreement between the observed and predicted rainfall during 2005 SW monsoon season. The observed seasonal rainfall was 87.7 cm while the predicted was 88.1 cm. The July rainfall which is very crucial for irrigation was estimated as 28.6 cm while the actual was 33.5 cm. From this method it would be possible to forecast the monthly and seasonal rainfall over India during SW monsoon season by March using only SST.

Agricultural sustainability

The United Nations has identified freedom from want, freedom from fear, and the freedom of future generations to sustain their lives on this planet as the three grand challenges of the twenty first century. Agricultural development is directly concerned with the first and third of these challenges. The World Commission on Environment and Development (Brundtland Commission) brought into perspective the three dimensions of development: environmental, economic and social. The follow-up Earth Summit at Rio in 1992 and the more recent summit of the World Commission on Sustainable Development at Johannesburg in 2002 emphasized the need to harness science in promoting policies for a worldwide sustainability transition that enhances human prosperity and reduces hunger and poverty while protecting the Earth's life support systems. These initiatives have led to a wide range of scientific work on development of frameworks for environmental sustainability assessments, mainly in the industrialized nations. The socioeconomic dimensions of sustainability have been the focus of sustainable rural livelihoods frameworks initiated by development agencies such as the World Bank. Agricultural development in many developing countries is equally concerned with both environmental and socio-economic impacts as agriculture is the major source of livelihoods support in these countries. More comprehensive assessments of sustainability that integrate the environmental and socioeconomic aspects of development are therefore essential for designing policies for agricultural development. Rao and Rogers (**page 439**) present such a comprehensive framework for assessing agricultural sustainability that builds on the analytical frameworks for environmental assessments and rural livelihoods assessments.

Uranium immobilization by granular biofilms

There has been an enhanced interest in biotechnological applications of metal–microbe interactions in areas such as bioremediation, power generation via microbial fuel cells and production of nanocrystals or nanowires. Conventional biological approaches for environmental remediation often use substratum-immobilized cells or mixed consortia of microbes in the form of bioflocs. Nancharaiah *et al.* (**page 503**) report the use of a novel immobilized biomass in the form of microbial granules for uranium(VI) immobilization. These microbial granules, which are self-immobilized microbial consortia, can be cultured in sequencing batch reactors and consist solely of mixed species bacteria bound together by their own extracellular polymeric substances and reportedly possess excellent ability for complete mineralization of organic pollutants. They also have the potential to immobilize metal or radionuclide pollutants from liquid waste streams. Microbial granules used in the present study for U(VI) immobilization show promising results in terms of specific uptake and, more importantly, immobilization at relatively low concentrations (6–100 mg l^{-1}). An ion exchange mechanism involving light metals is proposed to explain the uranium immobilization process. Microbial granules appear to be best suited for direct process development because of their physical characteristics such as easy culturability, compact nature and



fast settling. Although the mechanism of U(VI) immobilization requires further investigation, granule-based bioreactor may be a viable replacement for physico-chemical methods for immobilizing U(VI) from liquid waste streams.

Recovery after selective logging

Many tropical humid forests have been subject to anthropogenic intervention for centuries. Several such human activities in the past have been of low intensity without affecting considerably the environmental functions and species diversity. However, in contrast, most current management schemes for the production of timber result in much greater physical disruption of the forests. Compared to several other timber harvesting practices in natural forests, selective logging has been regarded as the ecologically sound practice as this system of logging should strive for minimal canopy opening and minimal soil disturbance. Some recent studies also reported that a selectively logged tropical forest can recover within 10–15 years after logging. However, Chandrashekara and Sreejith (**page 421**) found that the time required for the selectively logged forests to have growing stock of trees belonging to different successional species compared to that in primary un-logged forest can differ. Their results also indicate that the degree of disturbance caused by selective logging is so severe that the forest may require more than 50 years for recovering from the logging disturbance. Thus they argue that the prescribed 40–45 year felling cycle is not enough for a forest to completely recover.