In this issue

Sugary adobe

The Earth can be thought of one big recycling machine. Ever since its birth, it has been continuously recycling matter, energy and the basic elements from one form to another. Nothing is spared. This 'recycling' is inevitable. Human beings, however, can tinker with the cogs of this machine and, to a certain extent, decide *what*, *how*, *why* they wish to recycle. Particularly those objects discarded as 'waste'. One such example of 'waste' is the sugarcane bagasse: Heavy heaps of chewed out fibrous mass discarded by sugarcane juice vendors, and by sugar and biofuel factories. In a Research Communication, **page 1044**, researchers recycle this waste product by charring it and using its ash to develop the sugarcane bagasse ash brick. The questions that follow are obvious.

What are its ingredients? The recipe of this brick, along with sugarcane ash, is spiced with limestone and quarry dust. *How is it made?* It is made by following a process similar to that of traditional brick making – moulding, drying and roasting. And most importantly, *How strong and durable is the brick?* It appears that this brick outmuscles its counterparts in most physico-mechanical tests – the results of which would, most assuredly, raise an eyebrow. In fact, if what the study asserts proves practicable, then the usage of sugarcane bagasse ash as a building material would not only provide tens of thousands of people an alternative income, but would also reduce the wear and tear of the Earth's recycling machinery in the context of its hospitability towards life.

The hunger paradox

A silent emergency pervades through India: Malnutrition. According to the World Bank, a quarter of India's population, particularly women and children, are amongst the most malnourished in the world. This appears to be paradoxical considering that India, a 'sweat and soil' economy, is the world's second largest producer of farm products. Malnutrition, however, is not only the question of a dearth of food; it is also, and perhaps more importantly, the question of the nutritive quality of the food consumed. In India, especially in the villages, there are also sociological nuances, such as illiteracy and gender bias, which only exacerbate this affliction further. A General Article, **page 959**, realizes these nuances and implements a unique farming system in five villages of Maharashtra to alleviate malnutrition.

The farming system uses a three pronged approach of intervention to effect dietary changes in the villages. First, it empowers women to create community gardens by growing a wide variety of vegetables, ensuring a balanced diet for their families. Second, it encourages the villagers to sow better seeds to improve productivity; and third, it educates the villagers about the ills of soil micronutrient deficiency. The results of such an intervention are promising: Not only do the residents enjoy a more nutritious diet, but also their farms reap a higher crop yield than ever before. Therefore, such interventions, if encouraged in other regions, could prove to be a significant step towards nationwide nutrition security.

Royal disease

The Queen of Spices – cardamom – like any lady of noble blood, is highly valued. It is the third most expensive spice and India, being its second largest producer, has devoted thousands of acres for its cultivation. This 'Queen', however, is also rather delicate, often afflicted with fungal diseases.

One such disease *Azhukal* – 'to rot', in Malayalam – is perhaps the cardamom's most serious affliction. The disease first appears as innocent lesions on the leaves, and before long consumes the plant right down to the roots, leaving behind large tracts of rot in its wake. Such an incredible loss of crop is not only economically detrimental, but also sociologically deleterious because it affects the livelihoods of thousands. Therefore, there is an urgent need to understand the variables that influence the spread of this disease and seal the leak of socio-economic losses. A Research Communication, **page 1013**, takes a significant step in this direction by developing a mathematical model which forecasts the onset of the *Azhukal*.

Unlike traditional forecast models which are based on statistical regression, this model is based on the interplay of six weather variables which affect the spread of the *Azhukal*. These six variables are distilled from a set of fifteen variables by empirically ascertaining which one of them are vital to the spread of the disease. Once the six variables are identified, each one is given a mathematical weight and then incorporated into computer simulations. These simulations are fairly accurate and also show promise as a prognostic tool for other diseases as well.

Somendra Singh Kharola
S. Ramaseshan Fellow
ss.kharola@students.iiserpune.ac.in