Research Professor Changsheng Li (Director of the Low Carbon Agriculture Research Center at Shanghai Jiao Tong University, China)

When I was young, in my hometown in Xian, China, a lot of farmers were suffering from strange diseases and heart failure. They were dying suddenly in the winter and almost half the population died in one night in the villages. It was a very severe medical issue. I asked my father what was happening and he told me it was due to the poor quality of the local water supply and soil, although he was unable to explain what the pollutant was. As a result, I majored in geochemistry in college, and learned that there exists a discipline known as biogeochemistry which focuses on chemical elements transferred through animals and plants that can cause strange diseases. When I had the chance for further training, I studied these kinds of diseases and found that the strange deaths in my region were caused by a deficiency in selenium. It is a nutrient in soil and water and is only present in trace amounts, but if a deficiency occurs it affects heart tissue. When farmers harvest crops, they disturb the soil. The nutrients in the top soil are leached into the river where they dissolve. This was a very big issue in China in the 1940s and up until the 1960s. From our finding that the reason for heart failure was deficiency in selenium, medical doctors placed selenium in food – in biscuits and all food supplied to the affected areas – and the disease was effectively controlled.
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DEALING WITH DEFORESTATION AND REFORESTATION
A collaboration between the China State Forestry Administration and Michigan State University is contributing to improved management of the country’s natural resources. Dr Runsheng Yin is studying the consequences of China’s environmental restoration programmes and other governmental policy changes aiming to improve forest ecology and rural livelihoods.

INVENTIVE BIOMATERIALS
A dentist by training, Professor Yin Xiao from the Institute of Health and Biomedical Innovation at Queensland University of Technology, Australia, has since dedicated his research career to regenerative medicine. Here, he provides a unique insight into his motivations and the clinical significance of his stem cell work, with applications for bone disease and beyond.

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