Chinese scientists propose turning abandoned coal mines into underground farms

South China Morning Post, Sept 9, 2026

Insulated from surface weather and natural disasters, mining tunnels could offer agricultural advantages amid climate change, scientists say. There are an estimated 15,000 abandoned mines in China.

Chinese scientists have proposed developing "underground agriculture" in abandoned coal mine tunnels as part of a push to create a green, circular economy for the country's massive mining industry. A team of researchers from Shanxi, a major coal-producing province in central China, described the idea late last month in the journal *China Mining Magazine* (image below). An estimated 15,000 abandoned mines in China are expected to close by 2030. Insulated from surface weather and natural disasters, these subterranean spaces offer unique advantages.

The researchers are based at the Shanxi Province Coal-based Resources Green and High-efficiency Development Engineering Centre and have suggested that existing tunnels, power grids, ventilation systems and groundwater at these mines could be repurposed to support agriculture. "With climate change intensifying globally, the stability and sustainability of traditional land agricultural systems are facing severe challenges," they wrote, adding that there was a lot of practical value in developing "closed-environment farming".

The paper assesses whether critical factors – including light, temperature and water – could support these farming operations. While the former mines lack natural sunlight, their ample space and robust power infrastructure would allow for the installation and calibration of artificial lighting, according to the paper. Subterranean temperatures are also largely immune to seasonal fluctuations.

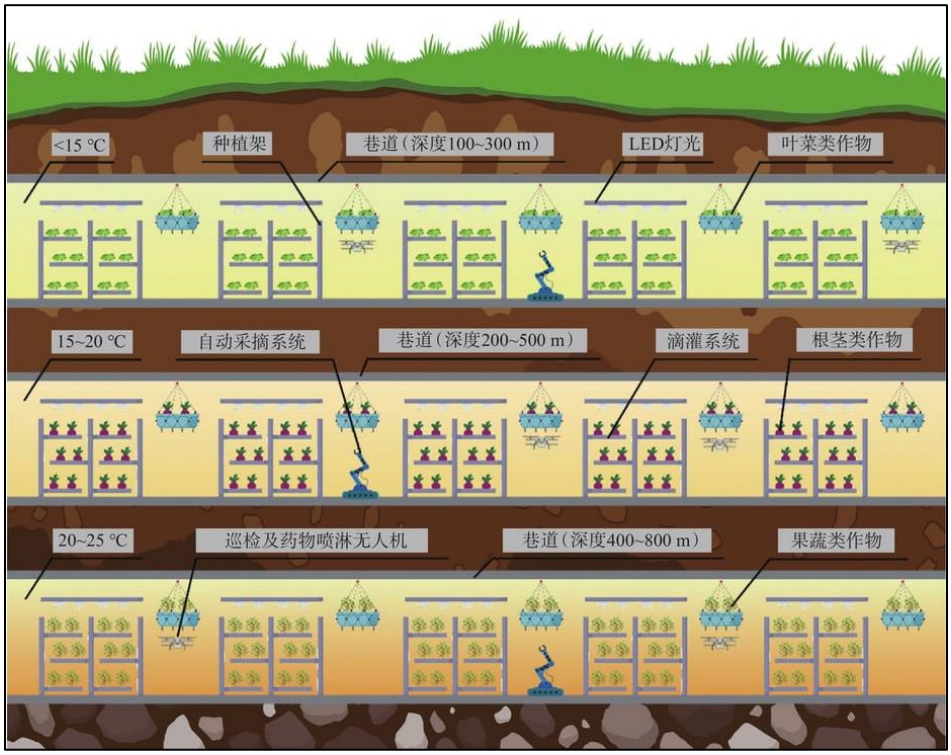
Geothermal energy could provide a sustainable heat source for crops, significantly curbing greenhouse gas emissions. The researchers add that transforming decommissioned mines into farmland could also aid in the treatment and use of polluted mine water.

Following a mine's closure, residual pollutants such as lubricating oils and hydraulic fluids become potential contamination hazards. These can spread through geological faults, fissures and poorly sealed boreholes, ultimately threatening surface bodies of water.

The authors said that establishing underground agricultural laboratories could "indirectly promote research, treatment and utilisation of mine water". For instance, mine water bearing high concentrations of sulphates and heavy-metal ions could undergo treatments – such as adsorption and membrane separation – before being used to irrigate acid-tolerant crops such as rapeseed and tea plants.

The researchers emphasise that the main goal was not large-scale crop production, but rather the creation of an "agricultural engineering experimental platform". This would allow scientists to

study the behaviour of key environmental factors – light, heat, water, air and carbon – deep underground and address cultivation challenges. The research could eventually support deep-space exploration, laying the groundwork for stable food production and ecosystem maintenance in extraterrestrial environments.



The proposed subterranean farming system uses different mine depths to optimise growing conditions for various crops (image by China Mining Magazine)

Between 2010 and 2019, China shut down around 12,000 abandoned mines. As more facilities are decommissioned, the volume of usable underground space is projected to reach around 7.2 billion cubic metres (254 billion cubic feet) by 2030.

Similar scientific trials are already under way in subterranean facilities in China and Britain. In Daye, a county-level city in Hubei province, researchers operating 245 metres (804 feet) below ground inside an abandoned copper mine are growing butterhead lettuce using artificial lighting, intelligent cultivation systems and low-carbon energy, according to Chinese news reports.

Meanwhile, in Britain, researchers in North Yorkshire have established the world's deepest underground farm more than 1,000 metres below the surface. They are running trials for a project that "could transform UK food production", according to a report in *The Guardian* last month. That operation is housed within a science facility at a working mine that produces polyhalite, a mineral used as an agricultural fertiliser.

The concept has been gaining traction for years. As early as 2018, Saffa Riffat, president of the World Society of Sustainable Energy Technologies, championed underground farming in old coal mines as a cost-effective method to meet growing global food demand. The idea has gained

support from some British mine owners, while the Chinese government has also expressed interest, according to a *BBC* report at the time.