‘Vertical farms’ make buildings greener

Researchers here have found a way to grow, say, kangkong and bean sprouts in “vertical farms” on the sides of buildings, removing the need for agricultural land.

The carbon dioxide needed by plants to grow will come from the building itself, making it greener.

The method – from a project started in 2008 and funded by the National University of Singapore (NUS) – has drawn interest from several overseas firms.

Mr Allan Lim, 38, chief executive of local company Alpha Biofuels which is partnering NUS, said the firm has successfully grown bean sprouts and kangkong. “The system is especially useful for Singapore because we have many buildings and not much land for farms,” he said.

The system involves creating glass enclosures on the sides of buildings. The vegetables or fruits are grown on scaffolds between two panes of glass. Carbon dioxide from air-conditioners and other systems in the building are piped into the glass cages and absorbed by the plants.

The researchers found that each plant starts absorbing at a much faster rate after the gas exceeds a certain level. The faster rate causes the plants to grow quicker, which means crops can be harvested more often in the year.

The method has several advantages over traditional “green walls” where plants grown on the sides of buildings take in carbon dioxide from the air outside.

The glass enclosures recycle the carbon dioxide from inside the buildings, making them greener.

Temperatures and the level of carbon dioxide in the glass enclosures can be maintained at selected levels, which means the plants are not exposed to the vagaries of weather and can be cultivated throughout the year.

The glass enclosures also insulate the building, which means that fewer air-conditioners and heating devices are needed.

The system can also be used in other industries that produce carbon dioxide, such as mines. The Wellard Group, an Australian agricultural firm, has expressed interest in using it to provide food for miners in remote mines.

If the deal is successful, carbon dioxide from the mines will be pumped into large containers outside the mines where the crops can be grown.

Researcher Kua Harn Wei, 40, an assistant professor at NUS’ School of Design and Environment, said more work needs to be done to find the optimal carbon dioxide level for each plant.

The researchers are also testing other crops and making sure the faster rate of gas absorption does not make them unsafe to eat.

Talks are ongoing for the system to be adopted in the Sino-Singapore Tianjin Eco-City in China.

The Government has set a target of 10 per cent of vegetables here to be grown locally within three years, up from 7 per cent now.

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