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Kalithasan (second from left) explains how water from fish breeding in the bigger tanks helps fertilise the plants in blue trays.

Clean water in and out

Pristine river water helps breed fish, which in turn fertilises plants, which then clean the water in a virtuous loop.

By **WONG LI ZA**
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THE size of the project was smaller than we expected, but its significance was much larger.

After a short uphill trek, we arrived at the 12th mile Orang Asli Settlement in Gombak, Selangor (along the old road to Genting Highlands).

Next to a house belonging to Raman Bahtuin, 46, were four huge plastic water tanks rearing fish such as tilapia (freshwater cichlid) and *puyu* (climbing perch).

Stacked above the tanks were trays containing water spinach plants. And the water itself was pristine stuff channelled down naturally from the Gombak River.

We were looking at an aquaponics system set up by students from the Aquatic Science Students Association at UCSI University.

The association is one of six grantees – consisting community groups and universities in Malaysia – who received a total of RM30,000 to implement river care projects under the third cycle of the National River

Care Fund (NRCF).

The UCSI students, who received a RM5,000 grant, set up an aquaponics system at the orang asli settlement – which has a population of about 3,000 – to promote sustainable management of the river and boost the livelihood of the community there.

“The students wanted to give back to the community. The project also created awareness on river protection among them,” said UCSI aquatic science head of programme Dr Teo Swee Sen.

“The orang asli aquaponics system is an ideal example because it involves teaching the indigenous community about utilising the river in their settlement,” said Dr K Kalithasan, project manager of NRCF and coordinator of the River Care Programme at GEC, during the site visit. “With it, they can produce their own food and potentially earn additional income using green and sustainable methods.”

Two birds, one stone

He added that the project has also provid-



ed a platform for UCSI students to be empowered in actual problem-solving initiatives through community outreach.

“As we are nearing the end of the project cycle, the purpose of this visit is to see how successful the project is and how practical it is to be duplicated by other communities,” explained Kalithasan.

Initiated by the Global Environment Centre, the NRCF was first established in 2015 and aims to support efforts made by interested groups to care for rivers, particularly to protect and enhance river ecosystems.

To date, it has given out 19 community grants totalling RM106,000 benefiting 26 recipients consisting community groups, education institutions and other interest groups.

Aquaponics is a system that combines aquaculture (raising fish) and hydroponics (growing of plants without soil). The system

integrates fish and plants together to provide organic food for the plants, which then naturally filter the water for the fish. So fish and plants complement each other – just like in nature.

The students first started working on the project in February by doing water quality tests along different parts of the Gombak River. They found that there was not much pollution in the water and that nitrate and phosphorus levels were high, making the water suitable for plants and fish.

“Prior to this project, we found that the orang asli were getting their fish and vegetables from the market far away. So we thought of setting up the aquaponic system to bring the source of food nearer to them,” said student advisor Jason Lim.

The river water used in the system is channelled directly from a river point located about 2km upstream via gravity flow – this means that it flows down naturally with-



A closer look at the water spinach growing in the aquaponics system.



With the new farming method, villagers could now breed tilapia in their backyard.

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Kalithasan, project manager of NRCF and coordinator of the River Care Programme at GEC.



'The orang asli were getting their fish and vegetables from the market far away', says Lim.



Raman says having the system so close to villagers' homes makes it very convenient to manage it.

Fish are bred and vegetables grown using the aquaponics system in this orang asli village. — Photos: LOW LAY PHON/The Star

out any need for electrical pumps.

Clean water

Water that flows out of the fish tanks will be used to fertilise other plants like pineapples and potatoes to be grown further down the slope utilising the hydroponic system.

"This is to ensure that the water that flows back to the river eventually is cleaner," explained Lim.

Currently, the system is only sufficient for the community's own consumption but extra units can be added later to the system.

"We hope this project can increase their side income as well as provide a source of protein to the community. We will also continue to check the river water quality to ensure it's safe to be used for the system and also monitor the health of the orang asli to see if there are any negative effects," said Lim.

Raman said the system is very easy to set up.

"With the system so close to our homes, it is very convenient for us to manage it.

Before this, we had a pond to rear fish but it was located far from our homes. We have many single mothers who are interested to get involved as well," he said.

Kalithasan said the project is a good example of closing the loop in the water cycle.

"When we extract river water to rear fish, and when we do aquaculture, we will have impact on the water body through the waste. When we have a two-in-one system, the vegetables to some extent will absorb the nutrients and waste from the fish.

"So the water that goes out is, to an extent, treated water via natural filtration. We also want to ensure that the water that leaves the system does not go back to pollute the river.

"As a whole, we have to ensure that water resources in the country is protected and secondly, the health of the people is assured," said Kalithasan.

NRCF Cycle III was made possible with support from Yayasan Hasanah, a foundation established by Khazanah Nasional Berhad. Successful applicants of Cycle IV will be announced end of Sept. To find out more, visit goc.org.my.