



Bringing agritech to Māori farm collective in rural Hawke's Bay

The Ministry for Primary Industries' (MPI's) Sustainable Food & Fibre Futures (SFF Futures) fund is helping a collective of four Māori farms in the Hawke's Bay bring agricultural technology (agritech) to remote rural areas in the region.

Ngāti Pāhauwera Development Trust, lead partner, has completed a feasibility study, which investigated deploying a LoRaWAN – a long range, wide area network – in the more remote areas of Hawke's Bay. This would enable farmers to use phones and other devices to remotely access data, such as soil moisture levels, from sensors in areas with no cell phone coverage around Mahia, Cricklewood and Omahu.

"All the farms are keen to adopt agritech to improve the productivity of their land and find ways to reduce impacts on the environment," says project leader Lewis Ratapu from Haunui Technology Group. "They would use sensor technology as a farming tool – for instance to monitor waterways or help understand the weather or soil moisture in a particular valley, which would give them a better understanding of what would grow well there."

The collective is also interested in finding ways to bring data science to customary knowledge around farming, such as Maramataka (the Māori lunar calendar), and traditional growing practices.

"Māori would use the moon and other environmental signs to forecast yield or determine when to plant crops or harvest plants and animals. Marrying this knowledge with data validates mātauranga Māori (traditional knowledge) and gives Māori a

greater advantage to increase productivity," says Ratapu.

Traditionally Māori land on the East Coast has been used to farm sheep and beef, Ratapu explains. "Many Māori farms struggle to return economic value to multiple shareholders. In order for these farms to return greater financial benefits, farms have to scale-up operations or diversify into horticulture and other business ventures.

"Using sensor technology will help farmers understand how to diversify into higher value crops by developing a better understanding of what might be good to grow on the land."

Ratapuu explains that many of the collective landowners lack capital, making land development a challenge. "The average Māori income in the Hawke's Bay region is less than \$21k per annum, 60 percent of Māori leave school without a qualification, and over 75 percent of Māori are in manual labour. If we can return an economic benefit, it could go a long way towards addressing some of the social inequities in the region."

There would be an opportunity to upskill young Māori as well. "A couple of Māori organisations, including Ngāti Pāhauwera, have tech hubs for youth so we're thinking about teaching these young people, as well as interested farmers, how to build and deploy a sensor. This would develop a new workforce to support this technology – so it's a whole ecosystem approach."

Ratapuu says looking after the environment is the number one concern for many of the collective's shareholders.



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“With the Māori farms, given there’s sometimes the interests of 5000 hapu members to consider, there’s a particular motivation to report back about the impact of farming on the environment. Use of sensors will provide some assurance to shareholders that we’re taking positive steps for Papatūānuku (Mother Earth).”

The project has involved undertaking a full site appraisal in Wairoa, Mahia and Hastings, and engaging with partners to test the network connection, as well as assessing hardware and software needs. The project team found that the available sensors were too costly to deploy across large geographical areas, so it has started building and testing its own.

“We now know that the technology is feasible so the next stage would be to implement it,” says Ratapu. “Potential benefits would include creating new jobs, developing an environmental

management plan, and giving the farm collective ideas of future ways to use the land.

“We’re most interested in the social and cultural impact of farming – that is, how we can increase the dividends going back to shareholders, many who have poor health and social statistics. It’s not just about growing more stuff but about improving the lives of the people who are connected to that land.”

Steve Penno, Director Investment Programmes at MPI, says a major driver behind SFF Futures is to support initiatives that make a positive and lasting difference to New Zealanders. “This communications system could enable rural farmers with no cell phone coverage to use new data technology, such as sensors, to improve local farming practice, which will open up valuable opportunities.”



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