

# RESEARCH DIRECTIONS

## Sustainable dairy sheds

**Dr Dharma Hagare from the Civionics Research Centre and Associate Professor Muttucumaru Sivakumar from the University of Wollongong together with Dairy Australia have been awarded a UWS Research Partnership grant to develop a dynamic model for sustainable management of dairy shed effluent using stabilisation ponds and recycling systems.**

'The long-term sustainability of the dairy industry in Australia depends on the efficient management of dairy shed effluent,' explains Dr Hagare. 'The effluent is a resource rich in water, salt, nutrients and energy content. The major impediment in recovering these valuable resources from the effluent is a lack of understanding of the chemical and biological dynamics of the processes used to manage the effluent. Our study will develop a model for simulating the operation of a stabilisation pond, which is the most common type of treatment used in dairy shed waste management. The model developed will assist in recovery of various resources (water, salt, nutrients and energy), helping increase sustainable management of dairy shed waste.'

The research team will build and calibrate a dynamic model of a real-world dairy shed effluent stabilisation pond system using an 'off-the-shelf' wastewater treatment modelling and simulation package. Existing wastewater data from a real-world stabilisation pond system will be converted into a form that can be entered into modelling and simulation software. The model will be calibrated with data collected from a full-scale and commercial dairy farm and then simulations will be run that represent various climatic and operational scenarios. These will include extended drought, a large rainfall event or above-average rainfall period, and different effluent irrigation and sludge extraction schedules.



The outcome of the research will provide information directly to Dairy Australia's "Effluent and Manure Management Database for the Australian Dairy Industry" documentation and contribute towards best practice among Australian dairy farmers.

**Project Title:** Development of a dynamic model for sustainable management of dairy shed effluent using stabilisation ponds and recycling system.

**Funding has been set at:** \$15,000

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