

2019/20 PhD Proposal – CSC-NZ-CFPN CRCC Joint Funding Programme

Information to be published on NZ-CFPN CRCC website if proposal is selected	
Project title	Food waste and its impact on food security: a big data prospective
Supervisor title and name	Pro. Brent R Young, Dr Bing Li and Dr Wei Yu,
Department	Chemical and Materials Engineering
School / Centre	Engineering
University	The University of Auckland
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Link to Supervisor's research page	https://unidirectory.auckland.ac.nz/profile/b-young
Project outline 150-300 words (approx) describing a possible PhD project, which has a link with an existing or potential research partner in China	<p>Food waste not only hinders the food availability for countries with limited food supply, but also causes unnecessary greenhouse gases emission and inefficient water and land usage. Globally, nearly one-third of all the world's food goes to waste, which accounts for 6.7% of all carbon emissions. In August 2019, food waste reduction has been identified as one of the most import measures to achieve New Zealand's Sustainable Development Goals.</p> <p>However, both New Zealand and China are experiencing difficulties in managing food waste effectively due to the lack of complete and detailed data on the types, quantity, and location of waste streams generated, making the economically-viable collection and processing of food waste infeasible. This project is to develop a food waste quantification framework and use New Zealand and as a case study. Substance flow analysis and process input-output analysis, as well as big data analytics, will be used to quantify the amount of food being wasted in New Zealand. Sensitivities analysis will also be used to identify key data for the framework construction. The impact of food wastage on natural resources (e.g. water, nutrients, greenhouse gas emission) will then be estimated. The success of this project will not only provide vital information for effective waste minimization and resource management but also help to reduce the unnecessary agricultural runoff to achieve New Zealand's Sustainable Development Goals.</p>
References for further reading (optional)	
Additional information to be used in proposal selection process	
NZCFPN CRCC priority area to which proposal is aligned (see list below)	<ul style="list-style-type: none"> • Food security, including food waste • Big Data and digital technologies
Brief outline of Supervisor's current research links with China or interest in developing them	I and my team are currently working with Tsinghua University and the Dongguan University of Technology on resource recovery and process modelling. As for this project, I would like to work with Prof. Huang Yue Fei at Tsinghua University for missing data treatment and to compare the effectiveness of food waste management systems in China and New Zealand.