RUN Position Paper on Food Security

Regional Universities Network

REGIONAL STRENGTH. NATIONAL SUCCESS.

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The Regional Universities Network (RUN) is a network of six universities with headquarters in regional Australia and a shared commitment to leading transformational change in their regions.

Through their educational and research contributions to regional economic, social, cultural and environmental development, the RUN member universities play an important and distinctive role in advancing Australia's national prosperity, productivity and identity.

The Network was established in October 2011. The foundation members are Central Queensland University, Southern Cross University, University of Ballarat, University of New England, University of Southern Queensland and University of the Sunshine Coast.

Food sustains health and wellbeing for individuals and communities, defining cultures and framing global political interactions. Food Security means guarantee of food availability, access, utilisation, nutritional quality and stability of supply[1]. It is at the heart of social and political stability in our region and key to inter-generational social and environmental justice.

Food Security is a long-term, transformational issue for Australia. Challenges include land degradation, population growth, long-term climate change, competition for arable land, scarcity of water, and nutrient and energy availability.

The RUN universities are universities of distinction with a collaborative tradition and research expertise in diverse fields critical to Food Security – in production, in post-production and in maintenance of the resource base, at relevant ecological, social and economic dimensions. Our combined teaching programs and research agenda are comprehensive and diverse, ranging from precision agriculture to nutrogenetics to business modelling to aquaculture. They place the RUN universities at the leading edge of Food Security innovation.

The communities served by the RUN universities are largely rural and so we are located in the very regions where food production occurs and where maintenance of the food resource base is most pressured.

We have the knowledge, research and innovation, professional skills and regional development capacity, as well as the drive and intent, to pioneer advances in Food Security and are uniquely placed to engage with food producers and collaboratively drive and see through the adoption of innovation.

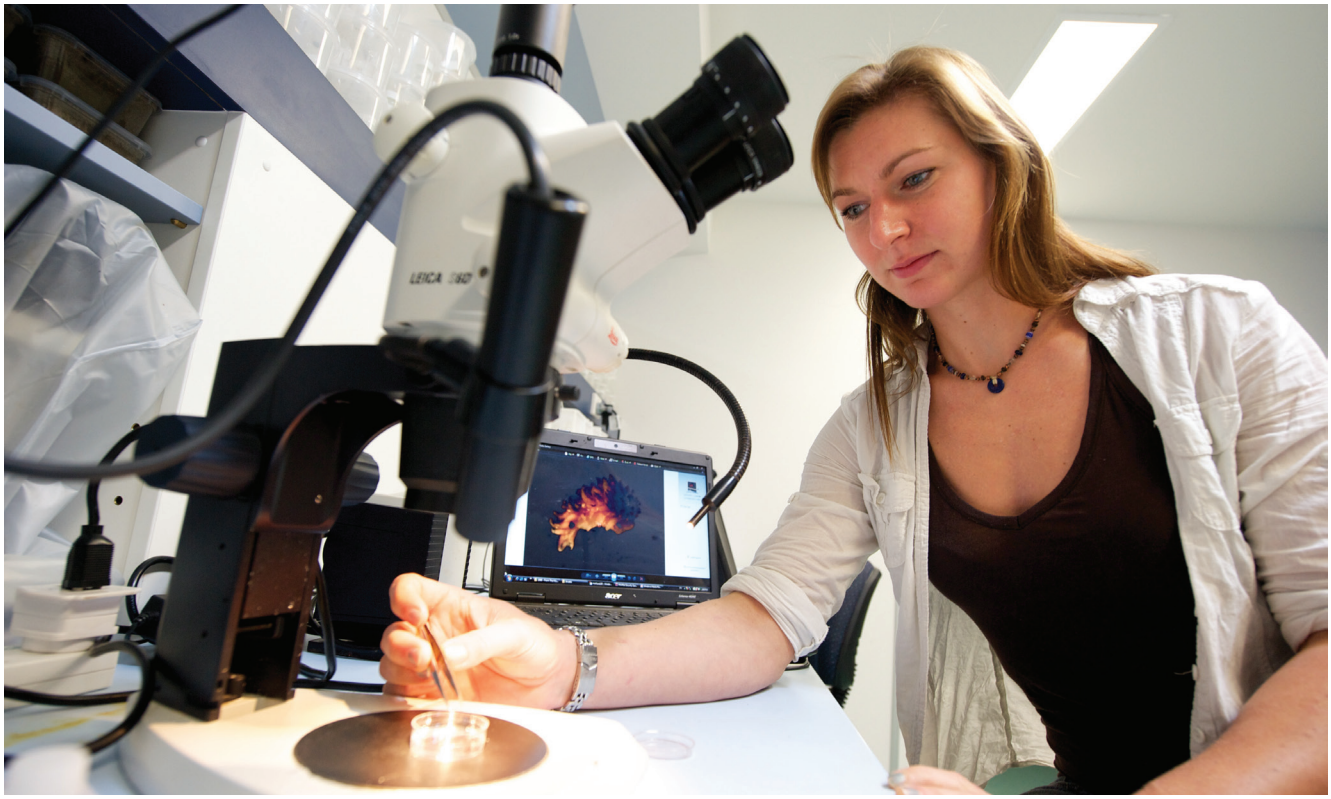
[1] *Wardell-Johnson, A, Uddin, N, Islam, N, Nath, T, Stockwell, B, Slade, C 2013 Creating a climate for food security: the businesses, people and landscapes in food production, National Climate Change Adaptation Research Facility, Gold Coast, pp. 144.*

Central Queensland University has a strong research profile in discipline areas linked to food security, underlined by a 2012 ERA rating of 5 in Agriculture, Land and Farm Management. The expertise base of research staff in agricultural production is in the core research areas of animal-based research (predominantly focused on the northern beef industry), horticultural research, and water and irrigation research.

Post harvest research strengths are in the development of non-invasive technologies for fruit quality assessment. Strengths in maintaining the resource base for food security are predominantly in natural resource management, soil health research and resource economics. A technology theme across these discipline areas has resulted in an emerging area of research on precision agriculture through the use of sensor networks, linking agricultural research to the engineering research capability within the University.

University of Southern Queensland undertakes research in agriculture and related environmental areas relevant to improving the profitability, environmental sustainability and socioeconomic wellbeing of rural industries and their natural resource base, as well as the manufacturing and service sectors which support them.

The National Centre for Engineering in Agriculture (NCEA) develops solutions for a sustainable and profitable rural sector with research covering irrigation, sustainable agriculture, energy use and food security. The Centre for Systems Biology (CSBi) conducts research improving the tolerance of winter cereals to biotic and abiotic stresses. The Australian Centre for Sustainable Catchments focuses on the impacts of climate variability on catchments with an emphasis on sustainable production and water supply systems.



University of Ballarat
Learn to succeed

The University of Ballarat specialises in the areas of postharvest food processing and maintaining the resource base. The food processing area includes storage, industrial manufacturing, product design and development, and traditional and innovative manufacturing techniques. The University of Ballarat also has capabilities in the food safety areas from both the microbial and chemical / analytical chemical perspective.

In addition, The University of Ballarat has a strong presence in understanding the influence of past and future climate change on the management of natural resources, particularly in key regions relevant to Australia's food producing industries.

University of the Sunshine Coast
The best of both worlds

The University of the Sunshine Coast has strength in the areas of aquaculture and horticulture, as evidenced by an ERA rating of 4 fisheries and forestry. This includes production systems, biotechnology, reproductive physiology, genetics, genomics and microbiology.

Food security is addressed through the social and economic dimensions in health science, business and marketing, as well as through the social sciences. Food policy and governance, social values underpinning food security and food choices, as well as social resilience characteristics of food production communities (Australian, developed and developing contexts) are areas of research expertise.

Global social change and global climate change influences on food systems and food security are key areas of funded climate change adaptation research at USC.

The University of New England's food security research addresses the need for sustainable intensification of existing land used for agriculture. Sustainable intensification essentially means producing more food from the same or a reduced area of land.

One of the key suite of technologies that has been nominated to achieve this are those encompassed within Precision Agriculture (PA). The innovations that fall within the remit of PA are numerous, however they are all concerned with increasing the efficiency of agricultural production systems by managing the soil, plant and animal systems at a finer resolution than has previously been practised.

The UNE Precision Agriculture Research Group (PARG) is a world leading provider of RD&E in the field of PA. UNE PARG has experience across a range of industries including grains, horticulture and animal production systems, with an extensive record of collaborative research and has existing collaborative projects with several other RUN partner organisations. In addition, UNE's Institute for Rural Futures has strong expertise in both, food market chain development and food biosecurity.

Southern Cross University has a world leading research profile in primary food production and rural and regional landscape systems. Of particular relevance to food security, SCU carries out research underpinning the cultivation and utilisation of plants. We harvest knowledge of how genetic and environmental factors contribute to end-use properties of crops and other added-value natural products.

In addition, SCU is an international leader in fundamental and applied geoscience research, tackling landscape and natural resource management issues that affect soil fertility and water resources. The high quality research across these fields at SCU was recognised in the latest Excellence in Research Australia 2012 assessment: SCU achieved the highest rating of '5' = 'outstanding performance, well above world standard' for 'geochemistry', 'crop and pasture production' and 'forestry sciences', along with three other areas of endeavour.

SCU is active with industry, government and community groups who share an interest in regional development and initiatives that involve various aspects of food production and food products. With a strong background in regional engagement, SCU has applied its cutting-edge research in partnership with leading national and international companies to find better ways to secure the supply of fresh food. SCU also has expertise in social impact assessment, and also has demonstrable excellence in the area of seafood research.

Pre-Production

ECOLOGICAL	SOCIAL	ECONOMIC
Agri-ecological production systems	Natural disaster planning and response	Nutrogenetics, genetics and genomics
Farm technology including Precision Agriculture, sensor and control systems	Land access	Bio-prospecting
Irrigation water use and productivity	Animal Welfare	Optimising on-farm productivity to conserve natural capital
Improving the efficiency of production inputs	Characterising social resilience in production systems	Business practices innovation
Land resource assessment	Integrating food security policy in Australian governance systems	Pricing
Environmental geoscience	Rural policy and planning for food landscapes	Agricultural oligopoly & monopoly
Risk Management	Social values in production landscapes	Local food business systems
Marine studies and marine biosecurity	Food Security and disadvantaged and Indigenous Australians	Food business and logistics, including supply chain
Animal and plant genetic diversity	Distributive mechanisms	Planning for scale
Biodiesel/bioethanol production	Social resilience and agricultural enterprise families	Infrastructure support hard and soft
Beef, aquaculture, horticulture and water management expertise to enhance natural capital	Regional development	Land use and environmental economics
Soil health	Succession planning amongst producers	Business models in triple-bottom-line compliant production
Precision livestock management to enhance natural captial	Agriculture and law	Integrating consumer preferences and values in vertically integrated food systems
Genetic integrity of indigenous food plants in production systems	Socially responsible local food production	Supply chain management
Tropical/sub-tropical agricultural systems to enhance natural capital	Nutrition in pre-production and soil nutrition	Integrated food systems logistics
Vegetable and tree crop agronomy and physiology to enhance natural capital	Governance and licensing of food and food production policy	Sensors in horticulture
Plant tissue culture	Local food production systems	Economic Impact Assessment
Irrigation management and new technologies	Health Impact Assessment	Financing
Development of new crops, including use of native species	Social Impact Assessment	Strategic planning
Forestry sciences	Triple Bottom Line Accounting	Value Chain Analysis
Non-invasive assessment in agriculture	Community engagement and education	Computer assisted surveys
Genetic integrity of indigenous food plants in production systems	Monitoring and Evaluation	Triple Bottom Line Accounting
Development of new crops, including use of native species	Social Policy	Innovative manufacturing

Post-Production

ECOLOGICAL	SOCIAL	ECONOMIC
Sustainable ecological systems supporting post-production food processing	Food tourism values	Markets and consumer preference
Value adding to food and managing impact on natural capital	Food supply for communities dependent on food systems (local, agricultural, industrial and social responsibility/justice)	Food processing - value adding to food produced
Nutritional biochemistry	Social values in global change and climate change food security scenarios	Integrated food systems logistics
Analytical capabilities (food chemistry, biochemistry, analytical chemistry)	Food safety	Food product development for food safety compliance
Applied microbial food safety	Culture, food miles and carbon consumption	Food storage
Post harvest physiology	Influence of food choices in human health and nutrition	Food service
Ecological integrity	Public health and access to nutrition by communities	Customer satisfaction
Ecological security	Culture and ethnicity in food choices	Value of food tourism
Carbon footprint analysis	Applied Australian food law	Economics of socio-ecological production landscapes
Bio fertilizer production and use	Food composition	Branding
Sustainable soils	Sensory characterisation	Market positioning
Managing climate change and variability	Social resilience and consuming communities	Food product design development
Water allocation and management	Consumer attitudes, consumer use of food	Integrating ecological values with social and economic landscape production values

CQUniversity AUSTRALIA

University of Ballarat
Learn to succeed

UNIVERSITY OF SOUTHERN QUEENSLAND

University of the Sunshine Coast
The best of both worlds

une
University of New England

Southern Cross University

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