House of Representatives Standing Committee on Agriculture and Industry

'Agricultural Innovation'

Submission from Murdoch University

GOVERNMENT AS BROKER:

POLICIES FOR MUTUAL INTERESTS & SHARED VALUES

While the respective contributions of Agriculture and Higher Education to Australia's export economy are well known, something whose value that is not so readily recognised is the affinity between the two which underlies the strength of each. This affinity can be seen in the distinguished record of higher education institutions' involvement in technological innovations which have **improved both agricultural science and profitability**. For in keeping with their traditional mission to produce and disseminate knowledge, universities have not only contributed via a number of disciplines to our understanding of agriculture and the conditions of its success – they have also **educated generations of agricultural leaders** who have in turn made this success possible.

While Agriculture and Higher Education continue to benefit one another by virtue of their own involvement in the broader economy, there is a growing realisation that the security and prosperity of each sector requires increased **collaboration with industrial and international partners**.

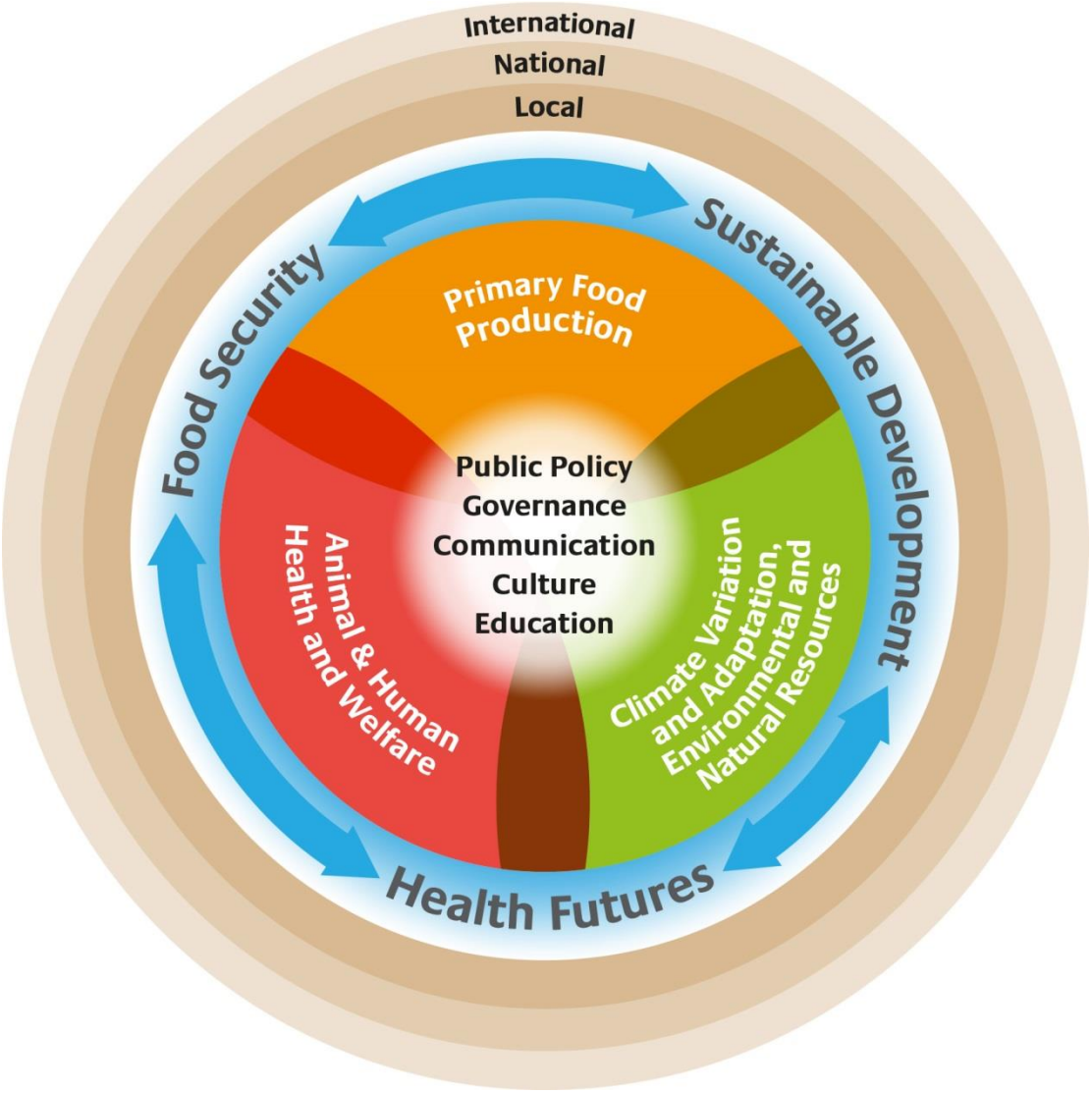
Whatever the forces of world markets, it is in this global context that **national governments retain a pivotal role since they are best placed to nurture and grow such collaborations**. As suggested by recent OECD reports[1], this role should not be understood simply in terms of the investment provided for basic scientific research (which is necessary, but not sufficient) but also, significantly, in terms of helping to facilitate intellectual property, growers' rights, commercialisation as well as knowledge transfer between sectors and between countries.

Presently, collaboration between the Higher Education and Agriculture sectors in Australia is best illustrated by the various (either statutory or industry-owned) Research and Development Corporations and Cooperative Research Centres. The work of these groups, and the anticipated role of the industry growth centre Food Innovation Australia, ensures that science at once informs and is led by the needs of agricultural production, thereby **consolidating**

[1] *OECD Innovation Strategy 2015: An Agenda for Policy Action*
http://www.oecd.org/innovation/OECD-Innovation-Strategy-2015-CMIN2015-7.pdf (pp.9-12)
Agricultural Innovation Systems: A Framework for Analysing the Role of the Government (OECD 2013)
http://dx.doi.org/10.1787/9789264200593-en (pp. 53-72)

resources and avoiding duplication of effort or unnecessary transaction costs. This holds not only for individual primary producers but also for the tax-payer in general.

For its part, Murdoch University is able to contribute to collaborations such as these because its research outlook is one focussed by a uniquely **strategic articulation of its disciplinary strengths**. This outlook, which informs planning within the University's academic units[2], can be seen in the figure below.



This strategic outlook not only allows for its **internationally recognised areas of research excellence to be supported effectively by the University's own organisational and financial resources** but so too, and in keeping with the government's role of broker outlined above, this serves as a beacon by which engagement with external and international groups can **identify and prioritise their collaboration with the University**.

[2] cf. both http://www.murdoch.edu.au/School-of-Veterinary-and-Life-Sciences/Our-research/ and http://www.murdoch.edu.au/School-of-Veterinary-and-Life-Sciences/_document/Research-Bulletins/VLSresearch-strategy-2015.pdf (p9)

INTERNATIONAL MODELS

In addition to the mechanisms in Australia that serve to drive innovation and international collaboration, examples from comparator nations such as the UK and Canada illustrate the ways in which the role of government is most effective when it not only serves to invest in agricultural research and training, but also when it takes a consultative role as broker in **helping to set priorities and facilitate collaborations**. For example

- the Agri-Tech Catalyst[3] programme of Innovate UK[4] which helps to focus on a specific priority area and aims to help take projects from research to as close to commercial viability as possible.
- the AgriInnovation[5] programme in Canada which comprises an Industry-led Research and Development Stream[6] together with an Enabling Commercialization and Adoption Stream[7] which seek to mobilize and prioritize agricultural research and commercialization opportunities.

CONCLUSIONS

Innovation has been an essential component of the success of Australia's agricultural industries and will continue to be so in the future, particular with evolving operating and biophysical environments. Our agricultural trade competitors all make significant investments in Research, Education and Training, and there is a danger that Australia will be lag and not fully capitalize on future opportunities.

The University sector plays a major role in this environment, educating the leaders of the future and also undertaking both basic and applied research and development that allows Australia to capitalize on evolving circumstances. Indeed, ahead of the longer term benefits of Australia being at the centre of emerging global technologies and practices, a more immediate benefit of these collaborations is that can directly address many of the more acute challenges facing the Agricultural sector.

It is clear that these national and international challenges – such as competition and market access[8], tax, regulation, management of risk, investment in infrastructure (water, transport and communications) – are firmly understood in this year's *Agricultural Competitiveness White Paper*[9]. In this context, and in keeping with the call for the role of government to be one of broker, it is important to **emphasise the insights of the *White Paper*** which recognise the government's provision of "farmers with knowledge and materials on cooperatives, collective bargaining and innovative business models" (p 31), and its delivery of a "strong rural RD&E system based around joint Government and industry investment" (p 97).

[3] https://connect.innovateuk.org/web/bioscienceskn/agri-tech-catalyst
[4] https://www.gov.uk/government/organisations/innovate-uk/about
[5] http://www.agr.gc.ca/eng/?id=1354301302625
[6] http://www.agr.gc.ca/eng/?id=1361927347817
[7] http://www.agr.gc.ca/eng/?id=1379526900252
[8] cf *The Australian Innovation System Report 2014* (pp. 169 & 172-3) http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/Australian-Innovation-System/Australian-Innovation-System-Report-2014.pdf
[9] http://agwhitepaper.agriculture.gov.au/SiteCollectionDocuments/ag-competitiveness-white-paper.pdf

APPENDIX: EXAMPLES FROM MURDOCH

Working out from individual projects with the Australian Centre for International Agricultural Research[10], as well as its own Commission of inquiry on *Australia in Global & Regional Food Systems*[11], in recent years the University has established a number of partnerships with leading organisations in China to improve the food security and production of both nations[12]. These include:

1. Australia-China Centre for Wheat Improvement[13] which enables Australian grown wheat to better cater to China's speciality product market and to increase wheat yield through genetic, molecular marker and bioinformatics technologies. (Partner: **Chinese Academy of Agricultural Sciences**)

2. Australia-China Joint Centre for Postharvest Grain Biosecurity and Quality Research aimed at solving national issues in Australia and China relevant to postharvest grain biosecurity and quality, including postharvest grain storage and insect control, pesticide usage and residues, management of grain quality and standards, grain nutrition, grain processing, marketing and policy, and translation of science into application/practice. (Partner: **Academy State Administration of Grains**)

3. Australia-China Joint Centre for the Management and Eradication of Exotic Invasive Species aims to manage plant biosecurity risk and reduce the trade hurdle between Australia and China. This will help safeguard trade and sustainability of Australia's agriculture, horticulture and forestry enterprises. (Partner: **Chinese Academy of Agricultural Sciences**)

4. Joint Research Centre for Abiotic and Biotic Stress Management in Agriculture, Horticulture and Forestry aims to undertake research that contributes to developing multiple stress-tolerant crops and production systems to achieving sustainable and durable yields of staple crops of food security significance (Partner: **Northwest Agriculture and Forestry University**)

5. Australia-China Joint Research and Training Centre for Veterinary Epidemiology which aims to manage plant biosecurity risk and reduce the trade hurdle between Australia and China. This will help safeguard trade and sustainability of Australia's agriculture, horticulture and forestry enterprises (Partner: **Huazhong Agricultural University, with support from the Chinese Ministry of Agriculture's Veterinary Bureau, the China Animal Health and Epidemiology Centre, and FAO Beijing office**)

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[10] http://aciar.gov.au/projects/term/230

[11] http://www.murdoch.edu.au/Murdoch-Commission/Commissions/Second-Murdoch-Commission/Australia-in-Global-and-Regional-Food-Systems/

[12] http://www.murdoch.edu.au/_document/Research-Scholarships/Research-Outlook-China-Focus.pdf

Five Australia-China Partnerships for Food Production, Security and Trade
http://iru.edu.au/media/55058/murdoch%20university%205%20australia-china%20partnerships%20for%20food%20production,%20security%20and%20trade%20poster.pdf

Food Security & Production in Australia & China
http://iru.edu.au/media/55076/murdoch%20university%20food%20security%20and%20production%20in%20australia%20and%20china%20poster.pdf

[13] http://accwi.org.au/wp/

Murdoch is well placed to commend the **efficiency and productivity of consortia**, as evidenced by the research links detailed below.

- Under the leadership of Professor David Pethick, researchers at the Sheep CRC have sought to understand the significant effects of genetics on yield and eating quality which has led to new breeding values for intramuscular fat (influencing juiciness and flavour), shear-force (a measure of tenderness) and carcase dressing (saleable yield). This has increased the productivity of meat value chains where up to 30% of carcases fail to meet optimal specifications[14].

- A joint appointment between the University and the Australian Export Grains Innovation Centre (AEGIC) – an initiative established together with the WA State Government – Professor Wujun Ma leads research into the protein content and composition of wheat and other grain food crops to increase the international competitiveness of Australia's export grains[15].

- Within the Western Barley Genetic Alliance – another undertaking between the University, WA State Government and AEGIC – Professor Chengdao Li is involved in national leadership in areas of barley genetic improvement and helps to train a new cohort of scientists capable of translating cutting edge genetics to meet industry needs (in 2014 WA barley production was valued at an estimated $880 million, as part of a multi-billion dollar national industry)[16].

- Grants and collaborations with (GRDC), CSIRO, Plant Biosecurity CRC, Citrus Australia, Table Grapes Australia, Australian Quarantine & Inspection Service (AQIS), Meat & Livestock Australia (MLA) and ACIAR have seen Professor YongLin Ren's research develop management and commercialisation strategies for novel insect pest diagnostic technologies and quality control that contributes to the profitability of plant biosecurity, food and trade safety throughout the value chain.

[14] http://www.sheepcrc.org.au/meat.php
[15] http://www.aegic.org.au/media/news/2014/05/new-professor.aspx
[16] https://www.agric.wa.gov.au/news/media-releases/new-barley-research-alliance-established