



Comments

Hodder (2018): ‘Independent scientific research entities in New Zealand’, Table 9

There have been numerous tweets about the discrepancies between Table 9 in Peter Hodder’s paper: ‘Independent scientific research entities in New Zealand: Cawthron Institute as a case study’ (Hodder 2018) and current practice in the National Science Challenges.

Of these comments, Professor Sally Davenport (at right) has the observation that ‘Things have moved quickly from establishment days’, which best reflects the simple cause of the mismatch between Table 9, compiled from MBIE (2016), and the current situation in 2019 (MBIE 2019).



Dr Hodder has updated the previous version (Hodder 2018: 15) as Tables 9.1 and 9.2, with the following commentary. From this it is apparent that the ‘challenges’ continue to be collaborative within and between universities, Crown Research Institutes, and the smaller ‘players’ – Government agencies and private research institutions.

As before, the number of challenges in which an organisation participates remains a function of its size (Figure 1A), albeit supporting the earlier suggestion of an optimum size of institution that participates in such challenges (Hodder 2018: 13). The same trend is apparent in funding (Figure 1B).

In this context, institutional size can be considered a proxy for research capability. For the universities the Performance-Based Research Fund (PBRF) score is a measure of research capability and this is positively correlated with the number of challenges in which each university participates and the funding (Figure 2).

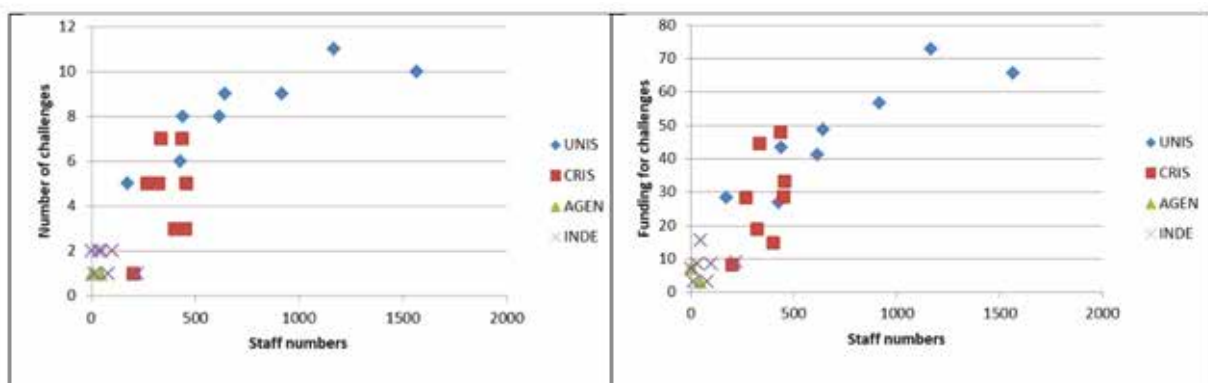


Figure 1. Variation of number of challenges with A (left) institutional size, and B (right) funding for challenges with institutional size (Legend: UNIS, Universities; CRIS, Crown Research Institutes, AGEN, Government / Local government agencies; INDE, Independent institutions.)

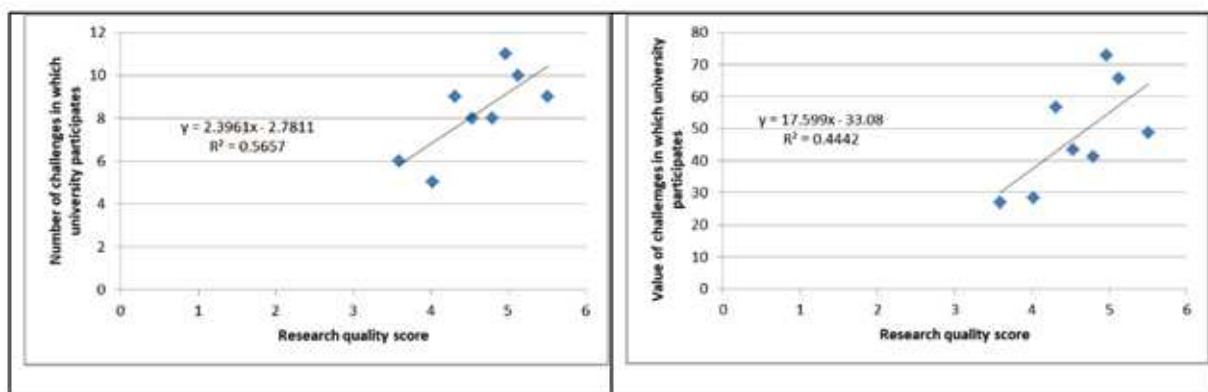


Figure 2. Variation of number of challenges with A (left) institutional size, and B (right) funding for challenges with research quality score for universities in the 2012 round of the PBRF.

References

Hodder, P. 2018. Independent scientific research entities in New Zealand: Cawthron Institute as a case study. *New Zealand Science Review* 75 (1): 3-16.

Ministry of Business, Innovation and Employment (MBIE) 2016. *National Science Challenges*. <http://www.mbie.govt.nz/info-services/science-innovation/national-challenges> (accessed 12 December 2017).

Ministry of Business Innovation and Employment (MBIE) 2019. *The 11 challenges in the National Science Challenge*. <https://www.mbie.govt.nz/science-and-technology/science-and-innovation/funding-information-and-opportunities/investment-funds/national-science-challenges/the-11-challenges/> (accessed 16 March 2019).

| TABLE 9.1 Collaboration partners (●) and hosts (■) | National Science Challenges* | | | | | | | | | | | Σ |
|--|------------------------------|------|------|------|------|------|------|------|------|------|------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| Universities | | | | | | | | | | | | |
| Auckland University of Technology | ● | ● | ● | ● | | ● | | | ● | | | 6 |
| Lincoln University | | | ● | | | ● | ● | ● | ● | | | 5 |
| Massey University | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | 9 |
| University of Auckland | ■ | ● | ● | ● | ■ | ● | ● | ● | ● | ● | | 10 |
| University of Canterbury | ● | ● | ● | ● | | ● | | ● | ● | ● | | 8 |
| University of Otago | ● | ■ | ● | ■ | ● | ● | ● | ● | ● | ● | ● | 11 |
| University of Waikato | ● | ● | ● | ● | | ● | ● | | ● | ● | | 8 |
| Victoria University of Wellington | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | 9 |
| <i>Subtotal: All participating universities</i> | 7 | 7 | 8 | 7 | 3 | 8 | 5 | 6 | 8 | 5 | 2 | 66 |
| Crown Research Institutes | | | | | | | | | | | | |
| AgResearch | ● | ● | | ● | ● | ● | ■ | | ● | | | 7 |
| Callaghan Innovation | | | | | | | | | ■ | | | 1 |
| Institute of Environmental Science Research | | | | ● | | ● | ● | | | | | 3 |
| Institute of Geological and Nuclear Sciences | | | ● | | | ● | ● | ■ | ● | ● | ● | 7 |
| Landcare Research | | | | | | ■ | ● | | | | ● | 5 |
| National Institute of Water and Atmospheric Research | | | | | | ● | ● | ● | | ■ | ■ | 5 |
| Plant and Food Research | | | | | ● | ● | ● | | | | | 3 |
| Scion | | | ● | | | ● | ● | ● | ● | | | 5 |
| <i>Subtotal: All participating CRIs</i> | 1 | 1 | 2 | 2 | 2 | 7 | 7 | 3 | 4 | 2 | 3 | 34 |
| Government / local government agencies | | | | | | | | | | | | |
| NZ Antarctic Research Institute | | | | | | | | | | | ● | 1 |
| Antarctic New Zealand | | | | | | | | | | | ● | 1 |
| Auckland Council Research Investigation and Monitoring Unit (RIMU) | | | ● | | | | | | | | | 1 |
| <i>Subtotal: All participating agencies</i> | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 |
| Independent institutions | | | | | | | | | | | | |
| Building Research Association of New Zealand (BRANZ) | | | ■ | | | | | ● | | | | 2 |
| Cawthron Institute | | | | | | | | | | ● | | 1 |
| Centre for Research Evaluation and Social Assessment (CRESA) | | ● | ● | | | | | | | | | 2 |
| Lincoln Agritech | | | | | | | ● | | ● | | | 2 |
| Malaghan Institute | | | | ● | | | | | | | | 1 |
| Opus International Consultants | | | ● | | | | | ● | | | | 2 |
| Prefab New Zealand | | | ● | | | | | | | | | 1 |
| <i>Subtotal: All participating independent institutions</i> | 0 | 1 | 4 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 11 |
| Total: All collaboration partners and hosts | 8 | 9 | 15 | 10 | 5 | 15 | 13 | 11 | 13 | 8 | 7 | 114 |
| Funding (millions of dollars, over ten years) | 34.7 | 34.9 | 47.9 | 31.3 | 83.8 | 63.7 | 96.9 | 59.4 | 106 | 71.1 | 51.1 | 680.8 |
| Funding per collaboration partner (notional, † over ten years) | 4.38 | 3.88 | 3.19 | 3.13 | 16.8 | 4.25 | 7.45 | 5.40 | 8.15 | 8.89 | 7.3 | 5.97 |

* National Science Challenges

- 1 **A Better Start | E Tipu e Rea** aims to improve the potential for young New Zealanders to have healthy and successful lives;
- 2 **Ageing Well | Kia eke kairangi ki te taikaumātuatanga** is researching how to sustain health and well-being as people age, enabling all New Zealanders to reach their full potential into the later years of life;
- 3 **Building Better Homes, Towns and Cities | Ko ngā wā kāinga hei whakamāhorahora** aims to improve the quality and supply of housing and create smart and attractive urban environments;
- 4 **Healthier Lives | He Oranga Hauora** is undertaking innovative research aimed at significantly reducing the death and disease burden of some of New Zealand's leading health problems;
- 5 **High-value Nutrition | Ko Ngā Kai Whai Painga** will enable the transformation of New Zealand's food and beverage industry to become an exporter of high-value foods with scientifically proven health benefits;
- 6 **New Zealand's Biological Heritage | Ngā Koiora Tuku Iho** aims to protect and manage New Zealand's biodiversity, improve our biosecurity, and enhance our resilience to harmful organisms;
- 7 **Our Land and Water | Toitū te Whenua, Toiora te Wai** aims to enhance the production and productivity of New Zealand's primary sector, while maintaining and improving the quality of the country's land and water for future generations;
- 8 **Resilience to Nature's challenges | Kia manawaroa - Ngā Ākina o Te Ao Tūroa** is enhancing New Zealand's ability to anticipate, adapt and thrive in the face of ever-changing natural hazards;
- 9 **Science for Technological Innovation | Kia kotahi mai - Te Ao Pūtaiao me Te Ao Hangarau** aims to tackle New Zealand's big high-tech challenges to grow the economy;
- 10 **Sustainable Seas | Ko ngā moana whakauka** is focused on enhancing the use of New Zealand marine resources within environmental and biological constraints;
- 11 **The Deep South | Te Kōmata o Te Tonga** is working to understand the role of the Antarctic and Southern Ocean in determining New Zealand's future climate and how the impact this role has on key economic sectors, infrastructure and natural resources.

† Assuming the funding for each challenge is divided equally across all collaboration partners and hosts

| TABLE 9.2 Collaboration partners and hosts | No. of challenges* | Value of challenges* | Capability measures | |
|--|--------------------|----------------------|---------------------|-------------|
| | | | Staff† | PBRF score‡ |
| Universities | | | | |
| Auckland University of Technology | 6 | 26.98 | 429.47 | 3.59 |
| Lincoln University | 5 | 28.44 | 174.10 | 4.02 |
| Massey University | 9 | 56.63 | 918.62 | 4.31 |
| University of Auckland | 10 | 65.52 | 1565.48 | 5.12 |
| University of Canterbury | 8 | 41.27 | 617.06 | 4.79 |
| University of Otago | 11 | 72.82 | 1168.24 | 4.96 |
| University of Waikato | 8 | 43.32 | 440.63 | 4.53 |
| Victoria University of Wellington | 9 | 48.57 | 641.54 | 5.51 |
| <i>Subtotal: All participating universities</i> | 66 | 383.55 | 5955.14 | |
| Crown Research Institutes | | | | |
| Ag Research | 7 | 48.04 | 436 | |
| Callaghan Innovation | 1 | 8.15 | 200 | |
| Institute of Environmental Science Research (ESR) | 3 | 14.83 | 400 | |
| Institute of Geological and Nuclear Sciences (GNS) | 7 | 44.63 | 332 | |
| Landcare Research | 5 | 19 | 321 | |
| National Institute of Water and Atmospheric Research (NIWA) | 5 | 33.29 | 454 | |
| Plant and Food Research | 3 | 28.5 | 453 | |
| Scion | 5 | 28.44 | 269 | |
| <i>Subtotal: All participating CRIs</i> | 34 | 224.88 | 2865 | |
| Government / local government agencies | | | | |
| NZ Antarctic Research Institute | 1 | 7.3 | 5 | |
| Antarctic New Zealand | 1 | 7.3 | 7 | |
| Auckland Council Research Investigation and Monitoring Unit (RIMU) | 1 | 3.19 | 43 | |
| <i>Subtotal: All participating agencies</i> | 3 | 17.79 | 55 | |
| Independent institutions | | | | |
| Building Research Association of New Zealand (BRANZ) | 2 | 8.59 | 100 | |
| Cawthron Institute | 1 | 8.89 | 220 | |
| Centre for Research Evaluation and Social Assessment (CRESA) | 2 | 7.07 | 3 | |
| Lincoln Agritech | 2 | 15.6 | 50 | |
| Malaghan Institute | 1 | 3.13 | 81 | |
| Opus International Consultants | 2 | 8.53 | 34 | |
| Prefab New Zealand | 1 | 3.19 | 14 | |
| <i>Subtotal: All participating independent institutions</i> | 11 | 55.00 | 502 | |

*Number and value of challenges: From TABLE 9.1

† Staff:

Universities: Taken as PBRF eligible staff from *Performance-Based Research Fund Evaluating Research Excellence – the 2012 Assessment* (Wellington; Tertiary Education Commission, 2013), p. 89-5.

Crown Research Institutes: AgResearch: Calculated from data in *Four Year Rolling Review: AgResearch Report from the Review Panel, 2016*, p. 35, <https://www.mbie.govt.nz/assets/4f291b43cd/agresearch-4-year-rolling-review.pdf>; Callaghan Innovation, About us, <https://www.callaghaninnovation.govt.nz/about-us>; ESR: “ESR employs around 400 expert minds”, <https://www.esr.cri.nz/our-people/our-science-team/>; GNS: “Over 85% of our [390] staff are directly involved in science”, <https://www.gns.cri.nz/Home/About-Us/Structure-People>; Landcare: <https://www.landcareresearch.co.nz/about/people/science-teams>; NIWA: “NIWA has more than 590 staff located throughout New Zealand and overseas”, <https://www.niwa.co.nz/about/our-people>, of which the Annual Report 2018 notes 76.9% are scientists or technicians, https://www.niwa.co.nz/static/web/NIWA13387_2018-Annual-Report_13LR_Web.pdf; Plant and Food Research: “We have over 900 people, 75% of who are working in our science operations teams”, <https://www.plantandfood.co.nz/page/our-people/>; Scion: Key science roles, <https://www.scionresearch.com/about-us/about-scion/our-people>; Scion: 321 staff in 2018, https://www.scionresearch.com/_data/assets/pdf_file/0009/64899/Scion_2018_AR_PartA.pdf, website shows 44 ‘key science roles’, 5 ‘key operational roles’, if the same ratio prevails across Scion, the number of scientists is estimated to be 269.

Government / local government agencies: NZ Antarctic Research Institute (a co-ordinating agency): Prospectus, p. 7, https://nzari.aq/images/downloads/NZARI%20Prospectus%202017_WebPDF_low%20res.pdf; Antarctic New Zealand (a co-ordinating agency): ‘Our people’, <http://www.antarcticnz.govt.nz/about-us/our-people/>; Auckland Council Research Investigation and Monitoring Unit (RIMU): <http://www.knowledgeauckland.org.nz/assets/Uploads/RIMU-Capability-Statement-Email-19-03-18.pdf>

Independent research institutes: BRANZ: “around 100 highly trained specialist staff”, https://www.branz.co.nz/cms_display.php?sn=401&st=1; Cawthron Institute: 220, <https://www.cawthron.org.nz/analytical-services/news/2018/reflections-cawthrons-longest-serving-employee/>, “194 staff employed” from Cawthron Institute Annual Report 2012, p. 17, (https://www.cawthron.org.nz/media_new/publications/pdf/2013_08/Cawthron_Annual_Report_2012.pdf); CRESA (a co-ordinating and collaborative organisation): Our people, <https://cresa.co.nz/our-people/>; Lincoln Agritech: Who we are, <https://www.lincolnagritech.co.nz/about/organisation>; Malaghan Institute: Our people, <https://www.malaghan.org.nz/our-history/our-people/> Of the “+90” staff referred to on the website, the Annual Report 2018 indicates 90% of the staff are in science-related occupations (<https://www.malaghan.org.nz/assets/Uploads/Documents/Annual-Reports/Malaghan-Annual-Report-2018-12.0-CP-web.pdf>); Opus International Consultants – Opus NZ: <https://www.wsp-opus.co.nz/services/research/our-people/>; Prefab NZ: <http://www.prefabnz.com/About/People>

‡ PBRF scores from *Performance-Based Research Fund Evaluating Research Excellence – the 2012 Assessment* (Wellington; Tertiary Education Commission, 2013), p. 89-5.