

Submission: Future Pathways Policy

Who am I?

My name is Rod White (D.Sc) , I am now retired, but was a distinguished scientist working in the Measurement Standards Laboratory of Callaghan Innovation. I now work as an independent researcher.

I was a practicing scientist in Measurement Standards for more than 40 years, during which time I represented NZ on many international committees, some as chairman, won two Royal Society Medals, was awarded a D.Sc for my contributions to my science, worked several times as a guest researcher in prestigious institutions in the USA and China, and published more than 100 reviewed papers, a well-known textbook, and contributed several sections to encyclopaedia.

Overview

NZ has a very small number of scientists covering a very small number of disciplines, and we are unlikely to make world-shattering contributions – so why do we need scientists? There are three reasons:

In my experience, the greatest benefit of scientists to NZ is as networkers. Science and technology are changing quickly. If we sit and wait in NZ for the developments to unfold, we will be at least 3 to 5 years behind other countries, both in exploiting the developments and recognising the risks. We need scientists to provide early warning of technological changes and developments, translate these developments for NZ to exploit, and defend New Zealand's interests on the world stage. The ticket into international networks and collaborations is a world class research record. Therefore, we must have world-class research in all disciplines relevant to NZ's interests. This is the place for fully Government funded research.

Secondly, New Zealand has massively increased its primary produce and tourism over the last half century – if that was a way to get rich, NZ would be an extremely wealthy country. Unfortunately, these industries generate low paying jobs in a highly competitive market. NZ's future is in niche industries producing goods with low transport costs. This requires a highly competent STEM workforce. There is room here for mixed government funding to help maintain key capabilities and commercially funded research to guide directions and contribute to industries unable to support a permanent R&D workforce.

Thirdly, in this time of fake news and incompetent fact checkers, we are all in need of critical thinking skills. Elementary science skills focussed on critical thinking should be a part of every citizen's tool kit and an integral part of NZ's culture.

The current SARS-Cov2 pandemic, and NZ's response to it, shows the benefits of all three aspects very clearly.

Management and operationalisation

During my 40 years as a government scientist, I witnessed and participated in more than 16 different CEO's visions of how science should be managed.

The worst I experienced was under Callaghan Innovation. CI's policy (under 3 different CEOs) has been to replace science managers with 'professional' public service managers. Unfortunately, the managers turn over every 18 months or so, so they have a very limited time to embed any change. They do not waste their time trying to understand the business, the staff, or their clients, instead remaining wilfully ignorant. They focus on the appearance of change, add to their CV, and move on before the damage becomes apparent. The result has been zero science planning for nearly a decade, a bullying and toxic environment created by managers suppressing questions, a highly disengaged, fearful workforce, and a mass exodus of the best scientists. It is very peculiar that these same managers think it necessary for CFOs to have financial experience, and HR managers to have HR experience, yet there is no need for science managers to have research experience.

The best model, by far, was the CRI model, when CRIs were managed by scientists, though it was far from perfect. Competitive funding has been a disaster. It consistently rewards sociopathic politically savvy operators, while exposing the bulk of scientists to a lottery with the practical effect of randomly terminating careers and capabilities. The best system would be capability funding, sufficient to pay all salaries and operating costs, accompanied by a negotiated changes in direction and negotiated (government and commercial) support for specific companies or industries on a case-by-case basis. Competitive funding served a purpose for a couple of years in the early 1990s by getting rid of dead wood left over from DSIR, but only did damage after that. In my experience, scientists are keen to apply their skills and help people, and interesting changes in direction are welcomed and often sought – they should be involved in the funding decisions.

Funding

I am a firm believer in balanced portfolios. Science priorities should be broad and not focussed on short term interests. It takes at least 5-10 years to create an expert in any area of science, so any focus on rapidly changing short-term interests will produce little benefit. Highly competitive funding should be avoided as it also discourages networking and collaboration. Funding should span curiosity-driven, through capability and directed research, to fully commercial research. That maximises the flexibility and capability of the science workforce.

Te Tiriti

I am intrigued by recent public arguments about Māori science. The cultural accumulation of ‘knowledge that works’ is what separates humans from other species. The argument is really about an evolutionary approach vs a directed approach to science. I’m in no doubt that the western (directed) science has things to learn from Māori culture, and vice versa. I’m in favour of diversity (in its true meaning) in all science – the more views and perspectives, the better the outcomes.

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