WA 2050

People, Place, Prosperity

Edited by Shamit Saggar, Rebecca Rey and Christopher Lin

Welcome to Country

Kaya, wanju – hello and welcome

Hello men, women and people out there, welcome to beautiful Kaarta Gar-up, beautiful Kings Park. May the good people and the good spirits look over all of us as we walk forward into the future, specifically to 2050.

I'm here on behalf of my elders, past, present and emerging, wearing the bookas that my elders gave me, one being mine, and one being my daughter's, who will carry on the work that I will do in the future. And that is what this report is all about – what do we need to think about going towards 2050? What's the future vision that we need to be thinking about for Western Australia?

I would like to also acknowledge the Aboriginal and Torres Strait Islander people and our non-Indigenous brothers and sisters who will walk this future journey with us.

Wanju wanju nidja Noongar boodjar. Welcome to this Country, acknowledging the 93 different Aboriginal nations across this amazing state, and we hope that you're inspired by what is in this report for you to enjoy.

Boordawhan, thank you and speak to you soon.

Ingrid Cumming
Whadjuk Balardong Noongar woman
Founder, Kart Koort Wiern

Scan this code for a Welcome to Country from Kings Park.
youtube.com/watch?v=h3Q-Uw570Qs

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Foreword:
Bold ideas for the mid-century

Modern research–intensive universities operate at the frontiers of knowledge and learning. Their success is underscored when they work in partnership with government, business and communities. This has been the proud hallmark of UWA's century–long mission to serve the people of Western Australia (WA). It has never been truer than it is today, as reflected in the publication of *WA 2050: People, Place, Prosperity*, packed with deep understanding and practical awareness that will improve lives, safeguard our environment and make WA a vibrant and connected place, characterised by a fair and equitable society and a prosperous economy.

WA is atypical in its size, remoteness, sparseness, aridity, biodiversity, resources and people. Its miniscule yet highly concentrated coastal population adds a further dimension of complexity. The social, economic and environment challenges it faces can appear almost unique, raising the question of which places WA is most similar to and compared with. Answers confusingly range from Alberta, Canada, to Norway, Saudi Arabia, New Zealand and, closer to home, Queensland.

All this is important because decision makers seek a single account of future challenges and opportunities that dwell on the big questions – the same questions that WA has to avoid getting wrong. These might include technocratic solutions that draw on current gaps undermining the effectiveness of existing policies. This report takes a close look at existing challenges in the policy landscape and their potential solutions. It fosters the spirit of bold proposals that can potentially transform how we live in WA and also signal a fresh start that will engage others.

My vision is to ensure that UWA is at the apex of these discussions. I am regularly asked how the University can be relevant to answering the pressing issues of the day and also take the lead in navigating those of tomorrow. *WA 2050* represents a response to those questions and I recommend it to anyone who wants to remain one step ahead of our mid–century future.

Professor Amit Chakma
Vice–Chancellor
The University of Western Australia

Introduction: Ideas to change the course of WA's future

You hold in your hands *WA 2050 – an open invitation to imagine Western Australia in new ways that are stimulated by big, bold ideas.* To secure fruitful opportunities, further ambitious thinking is needed, and the ideas and proposals that follow constitute a creative platform to do so.

Merely a generation ago WA was known as a huge, empty mining state with an unbridgeable distance from the national conversation. Today, the State is on the brink of expansion and modernisation, driven by Government policies to bring about both economic prosperity and a society at ease with itself. Fast-forwarding a generation ahead, 2050 seems ripe for resourceful and imaginative development, reshaping and perhaps even transformation. This is the space of progress we inhabit.

Laying resilient and fertile ground for WA

If there is one idea that lies behind this publication, it is that Western Australia's medium-to-long-term future can be strong and inspiring, withstanding external pressures. This can be achieved by bringing together expertise and know-how across the sectors responsible for research, government, business and communities.

The aim here is to set out the main issues at stake and foster a shared, better understanding so that today's decisions are properly informed by evidence sought by Government. A formula for collaboration and pulling together between academic experts, policymakers and practitioners is a hallmark of a well-governed state.

WA 2050 conjoins a broad cast of experts and practitioners to expose future issues, their implications, the trade-offs involved and, crucially, the actions that can be taken now to drive positive change. Indeed, each contributor identifies two practical interventions and the rationale for doing so; in this way, we counteract any sense of rudderless discussion. This publication is instead about galvanising expertise and experience so as to make practical recommendations for the secured future of our State.

Decision makers are increasingly expected to manage large volumes of evidence at a rapid pace. If that evidence is not easy to reach and tap into, then we are missing an important trick.

We show here that evidence and the insights it generates can be made accessible in WA, and that universities can be active and engaged in conversations and decisions that will affect the State for decades to come.

In practical terms, this publication is accompanied by the UWA Public Policy Institute's on-the-ground work to establish fruitful and mutually beneficial networks that connect university researchers to their peers in State Government, business and non-profits.

I look forward to hearing robust discussions on the topics at hand and invite you to share in our conversation on what WA could look like in 2050.

Professor Shamit Saggar
Director
UWA Public Policy Institute

People

Western Australia's population of 2.7 million in 2022 stands on the brink of expansion to the mid-to-high 3 million mark, boasting a highly liveable capital city that competes with the most appealing medium-sized cities in the world.

Attracting another million people, however, is a headline challenge that distorts the importance of gaining the right mix of skills, talents, ages, backgrounds and traits. What is clear is that the next phase will be driven by the State's ongoing labour shortages and should avoid duplication of strengths already present.

The optimisation of the next million should not overshadow the very considerable social exclusion problems that exist in WA today. The State has had limited ability to create ladders of opportunity for socially and economically marginalised groups – for instance, in communities at the geographic fringes of Perth, ill-served by educational, health and transport services. Others in regional, remote and Indigenous communities continue to struggle to share in the wealth of a state that is so dominated by its capital.

A more expansive future is likely to draw in many new faces, cultures, backgrounds and outlooks, and crucial opportunities lie to the north beyond the State in south-east Asia and to the west across the Indian Ocean Rim. With its distance from Australia's capital, WA enjoys considerable room to develop relationships of its own. It is not hard to imagine a distinctive WA brand taking hold in business and government circles across a small number of targeted countries across the Rim.

Some of the pertinent topics in this chapter address questions such as:
- How can we deliver on a 'Big WA' vision and integrate millions more migrants to cultivate a thriving society and economy?
- How do workplaces foster cultures of gender inclusivity that enhance women's progression into senior roles?
- What ingredients are needed for a culturally plural WA to flourish?

Part 1

People

What would it mean to receive millions more migrants into Australia?

Professor Farida Fozdar

Professor of Anthropology and Sociology, UWA School of Social Sciences;
Coordinator of the UWA Migration, Mobilities and Belonging Research Cluster

A conversation about a 'big Australia' was initiated by Prime Minister Kevin Rudd in 2009, sparked by projections that the population would increase from 22 million in 2010 to 36 million in 2050.[1] This would require 350,000 new migrants annually. Debate went silent as concerns surfaced about diversity, integration and infrastructure. Parochialism won the day.

More recently, Rudd argued that a larger population is necessary to deal with challenges, such as securing sustainable economic growth, dealing with climate change, addressing income inequality, supporting an ageing population, engaging with China's rise, and managing pandemics.[2] While I'm less convinced by his argument for the need for a larger military and population to populate and monitor our massive coastline, the other arguments seem sound. These are particularly relevant to WA.

WA depends on migrants to sustain its mining, health, horticulture and tertiary education industries. If we are to move towards a 'Big WA' to match the population with its geography, questions arise about who the migrants should be, where they should go, and how should they be positioned.

I suggest that:
- policy should encourage a mix of permanent and temporary migrants from a range of countries, allowing flexible settlement options for those wishing to stay, and prioritising sustainable industries, the knowledge economy and the health sector;

- incentives be provided to encourage migrants to settle in the regions, decentralising the State;
- the TAFE system be regionally expanded enabling universities to provide courses in partnership;
- infrastructure in the capital and regionally needs improvement – including water, public transport systems, roads, and more affordable housing options – to provide for a larger population and to forestall resentment from the existing population;
- recognition of the porous nature of national borders is overdue, as is recognition of the ongoing transnational social, cultural, economic and political relationships that migrants retain – these features are not threats, but bridges to more positive global relationships;
- until the value of ethnic minorities in leadership positions is recognised, Australia's economic and social development will be limited;
- a civic commitment to rapid large-scale migration will encourage cohesion only if the population is prepared and inclusive political leadership forthcoming.

Two proposals

1. Political leadership that focuses on the value of migrants and of a culturally diverse society is vital. Just as we have seen politicians rally support by demonising migrants, alternative, more positive visions that identify their social, economic and cultural contributions are necessary, to make a 'Big WA' work.

2. Employers should be provided with training that challenges their own individual biases in employment practices and promotes the value of diversity in their workplace.[3] The SBS Inclusion (Culture) Program offers a good starting point.[4]

1   "Rudd welcomes 'big Australia'", *ABC News*, (October 23, 2009), accessed on January 17, 2021, https://www.abc.net.au/news/2009-10-23/rudd-welcomes-big-australia/1113752

2   Andrew Tillett, "Big Australia vital to protect the home front: Rudd", *Australian Financial Review*, (March 9, 2021), accessed on January 17, 2022, https://www.afr.com/politics/federal/big-australia-vital-to-protect-the-home-front-rudd-20210309-p578ze

3   See this paper on how employers discuss reasons for not employing those from diverse backgrounds: Farida Tilbury and Val Colic-Peisker, "Deflecting responsibility in employer talk about race discrimination", *Discourse and Society* 17, no 5 (2006), accessed on January 15, 2022, https://www.researchgate.net/publication/46216005_Deflecting_Responsibility_in_Employer_Talk_About_Race_Discrimination

4   SBS Inclusion (Culture) Program, accessed on January 15, 2022, https://inclusion-program.com.au/culture.

My vision of a culturally plural WA

Sisonke Msimang

Writer, activist, political analyst and storyteller-in-residence at the Centre for Stories

Setting up a State-wide Storyteller-in-Chief or Historian-in-Chief

"The City of Chicago has a Storyteller-in-Chief and I love that idea. It's a person who essentially helps the city to think about its history and its story going forward. They're a kind of person who sews together various neighbourhoods and who reminds people where they've been, with a sense of helping the Mayor to shape the city moving forward."

Supporting libraries as old cultural infrastructure that foster community spaces and encourage multiculturalism

"I'm a huge fan of libraries. They're a place where we have books, they're a place where homeless people can go and get a break. Librarians do so much which is about knitting together. [...] A really important thing that communities need is rooms to meet, and libraries have rooms to meet."

Scan this code to watch the full video:
youtu.be/V8dFZQ0F79Q

Removing barriers for people with disabilities in WA

Paul Fleay

Chief Executive Officer, Australian Inclusion Group

The social model of disability proposes that it is not a person's disability that is the limiting factor in the success of social inclusion, rather it is society – its systems, structures, policies and attitudes – that creates the barriers. The Shut Out Report highlights this issue that is still very much prevalent today:

"If I lived in a society where being in a wheelchair was no more remarkable than wearing glasses, and if the community was completely accepting and accessible, my disability would be an inconvenience and not much more than that. It is society which handicaps me, far more seriously and completely than the fact that I have Spina Bifida."[1]

The inclusion of people with a disability (PWD) is a significant issue for all Western Australians as we move further into the 21st century. The impacts of social isolation are particularly pronounced for PWD, due to the existing, systematic barriers faced as a cohort. Recent research suggests that social isolation is as bad for your health as smoking 15 cigarettes a day, and the lack of inclusion has a direct economic and social impact for the wider community, not just to people with disabilities.

Evidence of the wider impact faced by this community can be found in the form of employment statistics. Economic modelling done in 2011 by Deloitte indicated that improving the employment rate for PWD would improve Australia's gross domestic product (GDP) by $43 billion through reduction in reliance on the Disability Support Pension and offsetting the fiscal gap caused by the ageing population and associated reduction in the workforce.

There are both physical and social barriers to PWD when accessing employment in addition to challenges related to education, recreation, housing and relationships. Only 53% of PWD are in the labour force (compared to 84% of people without a disability). In WA, despite ambitious targets for disability employment within the public sector, the rate of employment decreased from 2.4% in 2014 to only 1.5% in 2020. The Australian Human Rights Commission has identified 10 barriers to employment faced by people with a disability, 9 of which relate to attitudes, training, education, transport and workplace design rather than an inability to work because of a disability.

The 2020 Census identified 16.5% of people in WA live with a disability. This is an increase from the 2016 Census. Over the next 20 years, with an ageing population, we will see a further increase in the prevalence of disability. Removing barriers will ensure people with a disability can contribute economically, thereby reducing reliance on service. It will also connect people with their communities, reducing the mental and physical health impacts of social isolation, and allow "[p]eople with a disability...to live in a society where they are treated with respect, dignity and importantly with equality, and not as 'poor things' nor merely as recipients of services".[2]

Public policy and attitudinal change both have a critical role to play in removing barriers and improving social inclusion across our communities.

1   National People with Disabilities and Carer Council, "Shut Out: The Experience of People with Disabilities and their Families in Australia" (2009): 12, accessed January 16, 2022, https://www.dss.gov.au/our-responsibilities/disability-and-carers/publications-articles/policy-research/shut-out-the-experience-of-people-with-disabilities-and-their-families-in-australia.

2   "Shut Out", p 10.

True change requires both a top-down and a bottom-up approach and this requires community discussion and 'buy-in' on what inclusion actually is and not what often passes for inclusion (i.e., segregated activities). It also requires the WA Government and community leaders to set the conditions, frameworks, systems and expectations that will create the fertile environment to create social inclusivity.

Two proposals

1. Develop a State Inclusion Framework co-designed by Government and community, which sets the guideposts for the high-level decisions that shape our systems. Some jurisdictions around the world have a Minister for Inclusion to assist with the 'top-down' approach. In WA, we don't even have an agreed understanding of the terminology of 'disability', let alone what we are trying to achieve as a community. WA should create a holistic inclusion framework, with a Minister for Inclusion, to ensure that governments at all levels implement policy and associated funding that puts forwards an inclusive agenda for PWD.

2. Develop Disability Access and Inclusion Plans (DAIPs) to have Inclusion Goals. Public authorities are mandated to have DAIPs, however they currently focus on the Access component with no reference to Inclusion within the required 7 pillars. There has been much debate over the past decade on the usefulness of DAIPs but this stems primarily from the inward focus. Adding pillars that focus on Inclusion and on removing systemic and attitudinal barriers will achieve more than just focusing on the physical environment.

Both proposals could be supported by a State Inclusion Committee, and co-chaired by Government and People with Disabilities (WA).

A response

Catia Malaquias
Award-winning disability inclusion and human rights advocate

"Barriers to social and economic inclusion of disabled people result from entrenched prejudices reflected in law, policy, practice and culture. Ensuring inclusive non-segregated education is the most critical public policy step to achieve change; students with disabilities must be included and supported to learn in regular classrooms with non-disabled peers."

Decolonising Indigenous health: How and why WA can take the lead

Professor Dawn Bessarab

Bard and Yjindjarbandi woman; Director, Centre for Aboriginal Medical and Dental Health (CAMDH), UWA Medical School

"At the onset of COVID, Australian Governments finally put their trust in us – those with on-the-ground local insights and expertise to keep our people healthy. As we have all said time and again, we know what is best for our own health and wellbeing, and that of our families and wider communities. When control is in our hands, when we can exercise autonomy, we succeed".

June Oscar AO, Co-Chair, Close the Gap Campaign & Aboriginal and Torres Strait Islander Social Justice Commissioner, 2020 Indigenous Allied Health Australia (IAHA) National Conference, 27 November – 3 December, Sunshine Coast

As we move further into the 21st century, Western Australians have had a long lead time to discuss and reflect on the social, economic and health positioning of Aboriginal people across this large State. What has been missing from this conversation and reflection is the significance of the impact of colonisation on the social and emotional wellbeing, and economic and health outcomes of individuals and communities.

We know from the *Closing the Gap: Annual Data Compilation Report* (July 2021) that, nationally:

'Progress toward the seven targets is mixed. Three are on track (healthy birthweight babies, the enrolment of children in the year before full-time schooling and youth detention rates), with the remaining four not on track (life expectancy, adult imprisonment, out-of-home care for children and suicides).'[1]

The life expectancy of Aboriginal people when compared to non-Aboriginal people continues to lag despite attempts by Government to address this gap. The average life expectancy for Indigenous Australians is estimated to be 71.6 years for males (80.2 years non-Indigenous) and 75.6 years for females (83.4 years non-Indigenous).[2]

Why, despite all the good intentions and work put into closing the gap, is progress still slow in the four key areas? The slow progress is indicative of the necessary change to work differently rather than doing what has always been done. To do this, WA needs to decolonise Aboriginal health by acknowledging the legacy of colonisation and changing the deficit narratives surrounding this legacy that influences how Aboriginal people are viewed in this State.

This deficit narrative has constructed racial stereotypes and worldviews that describe Aboriginal people as inferior – the 'other' – and contributes to differential treatment within the health, criminal justice and child protection systems, silencing and preventing the Aboriginal community from participating in conversations and decisions relating to their destiny.

Control and the sovereign rights of Aboriginal people to make decisions about their future needs to be given back in the spirit of conciliation and the recognition that Aboriginal people, as First Nations people, have the right

1   Australian Government, Productivity Commission, *Closing the Gap: Annual Data Compilation Report, (July 2021),* accessed February 4, 2022, https://www.pc.gov.au/closing-the-gap-data/annual-data-report/2021.

2   "Closing Australia's health and life expectancy gap", *Alcohol and Drug Foundation (March 16, 2021),* accessed February 4, 2022, https://adf.org.au/insights/closing-the-gap/.

to speak up and control what happens on their country and influence their healing process.

There is mounting evidence globally of a dire need to construct new narratives of strength and resilience to counteract and replace outdated deficit-based colonial narratives that continue to inform the development of policies, services and the maintenance of negative stereotypes. In Canada, scholars Liam Midzain-Gobin and Heather Smith challenge the narrative of 'settler colonialism' that they argue is very present and not something that is buried in the historical past. This narrative, they say, 'continues to centre settlers and their interests, and is not a move to return land or authority, or rebuild meaningful relationships between the Crown, Canadians and Indigenous peoples'.[3] In WA, there is an opportunity for the Government to take the lead in acknowledging the colonial presence and how the settler colonial narrative continues to maintain settler ideas today.

To decolonise Indigenous health requires a major shift in thinking and practice. It requires a transparent acknowledgement and honest recognition of the legitimacy of Aboriginal knowledges and worldviews as functioning systems that can add value to the current conversations around closing the gap and building the capacity of Aboriginal Western Australians to own and control their own future.

Decolonising our thinking is to become aware of the racial undertones and systemic biases that exclude Aboriginal people from access to services that result in differential treatment with poor outcomes. Including Aboriginal people at the forefront of every conversation that involves their future wellbeing and supporting them to make their own decisions is to remove the paternalistic belief that Aboriginal people are still not capable of taking charge of their own destiny. To change and shift the colonial narrative is 'to build a decolonized, nation-to-nation relationship between Indigenous nations and the Government in the type of conciliation that is required'.[4]

Two proposals

1. WA needs to develop an operational plan as well as an evaluation process in leading and implementing the goals and strategies outlined in the new 'National Agreement on Closing the Gap' (CTG) launched in 2020.[5] The operational plan will take the CTG strategy from a rhetorical to an action- and evidence-based position that will demonstrate the WA Government's sincerity towards finding new ways to work with Aboriginal and Torres Strait Islander peoples. This new approach acknowledges the strengths and resilience of Aboriginal and Torres Strait peoples and, through partnerships, applies local place-based solutions and reforms to bring about change.

2. WA should develop a whole-of-government Aboriginal and Torres Strait Islander cultural policy that affirms the centrality of culture, and acknowledges Aboriginal and Torres Strait Islander knowledge systems in informing investments in Indigenous cultural governance, maintenance and revitalisation projects, initiatives, and activities.[6]

Further information

Scan this code to read the 2021 report, *Close the Gap: Leadership and Legacy Through Crises: Keeping Our Mob Safe:*

lowitja.org.au/page/services/ resources/Cultural-and-social- determinants/culture-for-health- and-wellbeing/close-the-gap- report-2021w

3   "Not in the past: Colonialism is rooted in the present", *The Conversation*, (March 29, 2021), accessed February 4, 2022, https://theconversation.com/not-in-the-past-colonialism-is-rooted-in-the-present-157395.
4   "Not in the past: Colonialism is rooted in the present".

5   Australian Government, Productivity Commission. *Closing the Gap: Annual Data Compilation Report.*
6   Lowitja Institute, *Close the Gap Campaign Report 2021, Recommendation 7,* accessed February 4, 2022, https://www.lowitja.org.au/content/Document/CTG_Report_2021_FINAL_WEB.pdf.

Changing public attitudes and behaviour towards environmental stewardship

Professor Julie Anne Lee
Director of Research, UWA Business School; Director, Centre for Human and Cultural Values

Associate Professor Joanne Sneddon
Associate Professor of Marketing, UWA Business School; Deputy Director, Centre for Human and Cultural Values

There is urgent need for climate action. This is recognised by the WA Government's commitment of $750 million to a Climate Action Fund. This investment targets important issues, promoting infrastructure, industry development and pro-environmental behaviour. However, it is not just about policy and investment – careful implementation is needed to motivate community action.

Personal values are a key driver of pro-environmental behaviour; however, people differ widely in their value priorities. Those who prioritise pro-environmental values act in an environmentally responsible way with little incentive. But not all people value the environment or engage in pro-environmental behaviour. Thus, policies that do not take individual differences into account are unlikely to promote the level of action necessary to mitigate climate change.

We suggest two strategies: (1) Mandating pro-environmental behaviour where possible, as this is likely to strengthen future pro-environmental values, which, in turn will naturally motivate future pro-environmental behaviour; and (2) Developing values-based campaigns that motivate pro-environmental actions.

Mandating pro-environmental behaviours

Research shows that the more people behave in a way that expresses a particular value, the more important that value becomes for them in the future.[1] Thus, policies aimed at

changing behaviour in the short term can also strengthen pro-environmental values in the longer term.

This is important, because our research shows that the values individuals consider to be highly important influence their behaviour to a far greater extent.[2] Mandating pro-environmental behaviour is increasingly employed around the world but can be expanded in WA. However, a limitation of this strategy is the potential for negative responses by citizens and the need for monitoring behaviour.

Developing values-based messaging campaigns

People are more likely to support policies and initiatives that reflect their value priorities and resist those that conflict with them. Research shows that values can be effectively used to motivate action, and values-based messaging has been used to promote pro-environmental behaviour,[3] but these messages tend to emphasise selfish values (e.g., promoting cash reward from the container deposit scheme). Given that people prioritise very different values, it is important to focus on those that are prioritised by different segments of society.

While some values naturally align with pro-environmental behaviour, others can inform less obvious triggers, based on the consequences of the behaviour. If we are to

1   Michele Vecchione, Anna K. Döring, Guido Alessandri, Gilda Marsicano and Anat Bardi. "Reciprocal relations across time between basic values and value expressive behaviors: A longitudinal study among children". *Social Development* 25, no. 3 (2016): 528-547.

2   Julie Anne Lee, Anat Bardi, Paul Gerrans, Joanne Sneddon, Hester Van Herk, Uwana Evers, and Shalom Schwartz. "Are value–behavior relations stronger than previously thought? It depends on value importance". *European Journal of Personality* (2021), accessed February 5, 2022, https://journals.sagepub.com/doi/10.1177/08902070211002965.

3   A. Herziger, J. Berkessel and K. K. Steinnes, "Wean off green: On the (in) effectiveness of biospheric appeals for consumption curtailment", *Journal of Environmental Psychology*, (2020), 69, Article 10145. Advance online publication, accessed February 5, 2022, https://doi.org/10.1016/j.jenvp.2020.101415.

mobilise everyone to act on climate change, we need to understand the full range of values that are important in our society. Based on our study of 1,122 adults, Western Australians clearly have diverse value priorities: the majority prioritise the welfare of others (27% universalism and 36% benevolence); however, 24% prioritise more conservative values (15% security, 5% tradition and 4% conformity), 12% prioritise openness-to-change values, and just 2% prioritise self-enhancing values (1% achievement and 1% power).[4]

For instance, motivating the 36% of Western Australians who prioritise either more conservative values or more open values will require different messages, based on the consequences of pro-environmental behaviour for their value priorities. Those who prioritise more open values of self-direction or stimulation are likelier to act when they are offered a variety of potential options to solve the problem, or when the activity can be made more challenging, stimulating (e.g., a game or treasure hunt), or fun (e.g., musical recycling bins). In contrast, those who prioritise more conservative values of conformity or tradition may be motivated to undertake pro-environmental behaviour to comply with societal rules and avoid upsetting others. Thus, strategies that focus on the outcomes of acting may be more effective for those who prioritise openness-to-change values, whereas strategies that focus on the outcomes of not acting may be more effective for those who prioritise more conservative values.

> However, policymakers need to be careful about emphasising personal gain from pro-environmental action.

While people who prioritise self-enhancing values are more likely to be motivated by personal benefits outweighing personal costs, these people are relatively few in WA, and communicating personal gain to those with altruistic motives may reduce altruistic pro-environmental behaviour.

If we don't act now, climate change will critically impact our future. This can be done through policies that mandate behaviour through rewards or penalties, which are likely to strengthen pro-environmental values in the long run. It can also be done with values-based messaging

that frames the consequences of pro-environmental behaviour in a way that motivates action from people with very different values.

Values hold great potential to change individuals' pro-environmental behaviour and should be a central element in policy and implementation.

Two proposals

1. Mandate a wider range of pro-environmental behaviour (e.g., mandatory recycling and composting ordinance in San Francisco USA; banning coffee-pods in Hamburg, Germany), as this not only requires action but is also likely to strengthen future pro-environmental values, which in turn will naturally motivate future pro-environmental behaviour.

2. Develop values-based campaigns, across both traditional and social media platforms, to motivate pro-environmental actions. These campaigns should remind people with pro-environmental values to act, and in addition, focus on the consequences of acting, or of not acting for those with other value priorities (e.g., people who prioritise openness could be offered options, challenges and fun activities that promote pro-environmental action, whereas people who prioritise more conservative values could be reminded about social expectations).

4   J. A. Lee and J. Sneddon, "Values in WA", *Going Further, Faster: A Policy Agenda for WA 2021*, accessed February 5, 2022, https://www.uwa.edu.au/institutes/public-policy/-/media/Public-Policy/Documents/UWAPPI-GFF-report-WEB.pdf.

What it means for WA to better connect with Asia

Dr Yu Tao

Senior Lecturer and Coordinator in Chinese Studies, UWA School of Social Sciences

According to the historical population data released by the Australian Bureau of Statistics, only 410 Western Australian residents were born in China in 1947. As the new century unfolded in 2001, 10,730 Western Australian residents recorded their birthplace as the Greater China region. According to the latest census data, this figure increased fourfold in the following 15 years, reaching 42,710 in 2016.[1]

In other words, more than 1 in every 60 Western Australian residents today were born in Mainland China, Hong Kong, Macau or Taiwan.

This figure does not include any second-generation immigrants and their descendants. Nor does it cover people with Chinese ancestry who relocated to Australia from Southeast Asia, North America and other parts of the world. A similar trend can be observed among migrants from India, the Philippines, Vietnam and other parts of Asia. As more and more Asian people reside in WA, Asian communities have become inherent components of our State's culturally diverse population. Moreover, many members of Western Australia's Asian communities are active contributors to our State's continuing economic and social development. They provide labour, skills, knowledge and experiences to WA's large and small business entities, government and public agencies, as well as TAFE and university campuses.

WA has an excellent record of pioneering engagement with Asia. James Stirling listed trading with China as one of the four competitive advantages for the prospective Swan Colony. The first Asian immigrants arrived in the same year as the appointment of the first Governor. As proudly stated in the introductory materials displayed in WA Museum Boola Bardip alongside the artefacts from local Chinese communities, in the early era of the White Australia policy, our State provided a relatively friendly environment to Asian workers, benefiting from the group's contribution to easing labour shortages.

WA occupies a unique geographical location that, if properly utilised, can define it as a natural gateway for Australia and Asia to interconnect. We are, however, now living in an era when connectivity is no longer defined by geographical proximity but travelling time. Before the COVID-19 pandemic, there was only one direct flight between Perth and mainland China, and it was more convenient to travel to London than to Delhi and Islamabad. Therefore, WA has become less competitive than the eastern states in attracting human capital, international students and tourists from Asia. For example, data from the Federal Government shows that WA only attracted 2.86% of the country's Chinese international students, 4.97% of the country's Vietnamese international students, and 6.19% of the country's Indian international students between January and October 2021.[2]

1   Australian Bureau of Statistics, "Historical population", (2016), accessed January 25, 2022, https://www.abs.gov.au/statistics/people/population/historical-population.

2   Australian Government, Department of Education, Skills and Employment, "International student numbers", accessed January 25 2022, https://www.dese.gov.au/international-data/data-visualisation-international-student-numbers.

WA also has ample room to improve its understanding of and engagement with the Asian communities. For example, in the early days of the COVID-19 pandemic, it made national news that a local landlord evicted a Malaysian student of Chinese descent, citing coronavirus fears. As Mark McGowan pointed out, the landlord's behaviour was "disgraceful and un-Australian", and the Premier admitted that "we are hearing far too many stories about people facing hate and discrimination just for their heritage".[3] Moreover, given that Australia's restrictions were applied solely to mainland China when the incident happened, the landlord seemed not to understand that many people of Chinese descent live outside the People's Republic of China. As exposed by this incident, the lack of knowledge, skills and understanding of Asian cultures, societies and politics among some Western Australians is worrying.

Unless efforts are made to help Western Australian Asians feel welcomed, understood and respected, the globalisation process that has brought many Asian talents to Western Australia will also take them away.

Two proposals

1. WA should brand itself more strongly as Australia's primary gateway to Asia and Asia's primary gateway to Australia. The State Government should work more closely with the transport, tourism, international education, hospitality and public relations industries to further enhance WA's connectivity to Asia. For example, given that India is the State's top sending country of international students, incentives should be provided to establish direct flights between Perth and major Indian cities such as Delhi or Mumbai. In addition, targeted campaigns, such as deploying tailor-made Asian-language advertisements in Asian countries, should be developed to attract more workforce talent, international students and tourists from Asia.

2. WA should proactively enhance its governments, business and people with knowledge, skills and understandings of the histories, geographies, societies, cultures, politics and languages of the diverse countries of Asia and their engagement with Australia. Following the successful example of the National University of Singapore's East Asian Institute, the State Government should support and incentivise universities to develop policy-orientated knowledge-exchange units with a specific regional focus on Asia. In addition, further support and incentives should be provided for the emergence of cultural consultancies that can provide professional advice for Western Australian businesses and people to better engage with Asia and embrace multiculturalism.

A response

"The contributions of Asian migrants and other Asian Western Australians are not limited to business, investment and as international students, but extends to shaping Australia's creative culture. It is important for Government to foster cross-cultural collaborations in the arts based on inclusivity and respect, particularly amongst the youth community."

Wanjie Song
Lawyer, State Solicitor's Office

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3   Frances Bell, "Coronavirus fears see Malaysian student evicted from Perth share house by landlord", *ABC News* (February 12, 2020), accessed January 25, 2022, https://www.abc.net.au/news/2020-02-12/foreign-student-evicted-from-perth-house-over-coronavirus-fears/11959530.

Understanding the impact exposure to domestic and family violence has on WA children

Dr Carol Orr

Research Fellow, UWA School of Population and Global Health

t is conservatively estimated that 11% of Australian children are exposed to domestic and family violence (DFV) perpetrated against their mother by a male partner or ex-partner.[1] Aboriginal and Torres Strait Islander children experience higher rates of DFV exposure than non-Aboriginal and Torres Strait Islander children,[2,3] although this needs to be understood as both a cause and effect of social disadvantage and intergenerational trauma stemming from colonisation.

Internationally, we currently do not have sufficient evidence on the impact DFV exposure has on children. Researchers at the UWA School of Population and Global Health used linked population-level health and police data to investigate this impact on WA children. It was found that, compared to non-DFV-exposed children, those children exposed to DFV are 34% more likely to be hospitalised, with higher likelihood of hospitalisation for a range of health issues including mental ill-health, skin infections, respiratory disorders, infectious diseases, injury and poisoning. Exposed children are also more likely to have school-related issues including poor attendance, higher rates of suspension and be developmentally vulnerable upon school entry than non-exposed peers.

Despite State and Federal intervention, results from the most recent Australian Personal Safety Survey indicated that rates of DFV in Australia have remained steady since 2005.[1,4] More recently, WA police recorded a 15% annual increase in DFV-related assaults in 2020.[5] Without an end to violence against women, Australia's children will continue to be exposed to violence, increasing their risk of a multitude of negative health and social outcomes impacting their ability to achieve their full potential across their lives.

1   Australian Bureau of Statistics, "Personal Safety, Australia", (2017), accessed January 27, 2022, https://www.abs.gov.au/statistics/people/crime-and-justice/personal-safety-australia/latest-release.

2   Carol Orr, et al, "A Demographic Profile of Mothers and Their Children Who Are Victims of Family and Domestic Violence: Using Linked Police and Hospital Admissions Data.", *Journal of Interpersonal Violence*, (2020), accessed January 27, 2022, https://doi.org/10.1177/0886260520916272.

3   "Changing the picture, Background paper: Understanding violence against Aboriginal and Torres Strait Islander women and their children", *Our Watch*, (2018), accessed January 27, 2022, https://media-cdn.ourwatch.org.au/wp-content/uploads/sites/2/2020/09/20231756/Changing-the-picture-Part-1-AA.pdf.

4   Australian Bureau of Statistics,"Personal Safety, Australia", (2005, reissued 2006), accessed January 27, 2022, https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4906.0Main+Features12005%20(Reissue)?OpenDocument.

5   Australian Bureau of Statistics. "Recorded Crime - Victims 2020", (2021), accessed January 27, 2022, https://www.abs.gov.au/statistics/people/crime-and-justice/recorded-crime-victims/2020.

Two proposals

1. Further research on the impact DFV exposure has on children is needed to support their health and wellbeing. Wider datasets from Government and not-for-profit sectors should be made available for linkage across these agencies, to ensure primary and secondary preventative interventions are targeted and effective.

2. Government funding is required for health, education and social services to educate frontline workers, in an evidence-based manner, on the impact DFV exposure has on children. It is essential that workers are able to support and respond to children without causing further trauma to the child; a restorative and trauma-informed approach is vital.

A response

"Left unchecked, growing incidents of DFV will have significant consequences for both Western Australian children and the community at large. Orr's proposal that data from Government and not-for-profit sectors be made available would help researchers determine why current interventions have failed to curb rates of DFV."

Ella Regan
Graduate Officer – Compliance and Investigations, Department of Mines, Industry, Regulation and Safety

Creating a vibrant care economy for healthier, happier ageing in WA

Professor Loretta Baldassar

Professor of Anthropology and Sociology, UWA School of Social Sciences; Director, UWA Social Care and Ageing (SAGE) Living Lab

Dr Catriona Stevens

Forrest Prospect Fellow, UWA School of Social Sciences; Manager, Research Engagement, UWA Social Care and Ageing (SAGE) Living Lab

How do you see your life progressing over the next 20 years? Whatever your life circumstances and goals, there is one shared certainty: we will all be ageing.

According to the Australian Bureau of Statistics, across Australia, if you are 65 years old today, your life expectancy is 84.9 years for men and 87.6 years for women (and about 8-10 years less for Indigenous Australians).[1] Compared to 65 years ago, this represents an increase of almost 21%.

While living longer is good news, ageing can bring challenges, with the potential for increased vulnerability and decreased independence. Although new research into healthy ageing shows that much can be done through diet and exercise, current trends also reveal increasing prevalence of age-related disabilities, in particular alarming rates of dementia (the second leading cause of death in Australia).[2]

There is no doubt that the future of healthy, happy ageing involves the need for quality care. Yet care work, including formal paid care, informal family care, and forms of social and community care are currently undervalued, underpaid and poorly understood. The solution requires us to develop a vibrant care economy, built on a currency of wellbeing to safeguard our vulnerable older aged.

Supporting Western Australians to age well demands concerted efforts from government, industry and individuals to reduce ageism, build strong and connected communities for all ages, and, most importantly, develop a care sector that can respond to the changing demography of this State across urban, rural and regional areas.

Current aged-care models support excellent medical, physical and personal care, but we urgently need to acknowledge the important role of social care. Critical barriers to ageing well include ageism and a lack of social support to safeguard against isolation, loneliness, abuse, and neglect.

1   Australian Government, Australian Institute of Health and Welfare, "Deaths in Australia", (June 25, 2021), accessed January 27, 2022, https://www.aihw.gov.au/reports/life-expectancy-death/deaths-in-australia/contents/life-expectancy.
2   Dementia Australia, "Dementia statistics: Key facts and statistics", (January 2022), accessed January 27, 2022, https://www.dementia.org.au/statistics.

The growing challenge of loneliness

Loneliness is a major public health issue associated with increased cardiovascular, autoimmune and neurocognitive problems as well as greater depression and anxiety.

The need to develop social support programs was identified in the 2021 Royal Commission into Aged Care Quality and Safety Final Report,[3] and this has become even more important in the context of COVID-19. Relatedly, the Commission noted that the sector is well behind in its use of technology.

Social technology, embedded in personalised social and cultural relationships, and taking into consideration inequalities in access and digital literacy, is a key plank in ensuring people can build better community connections and improve self-management of medical conditions.

Growing a secure, professional care workforce

Alongside social care interventions supported by social technology, WA requires a vibrant care workforce – people who are engaged, professional, and secure in their work. Yet, the Royal Commission highlighted a lack of training, precarious and poorly paid conditions, and inadequate levels of staffing as critical barriers to quality care; the latter alone deemed a form of institutional abuse. In addition, the safety and dignity of this care workforce is undervalued by our society, with negative consequences for workers' mental health and wellbeing.

Our aged sector is and will continue to be heavily reliant on migrants to meet increasing demand. Sadly, for many working in the sector, low pay and precarious employment make care work a job of last resort. This can result in job churn as deskilled migrants often face limited long-term opportunities in the sector.

Capitalising on immigration

WA has traditionally relied on immigration to build capacity in other sectors. For example, the Perth population grew by almost 30% from 2001–2011 in response to the resources supercycle. There is an opportunity to build on past successes and develop new migrant recruitment and settlement programs targeted to address the future care needs of WA.

Through investment in building a world-leading care sector, the WA Government can both improve the quality of life of older Western Australians while also securing a more diversified and sustainable economic future for the State. Investment in care economies improves gender equality by supporting a heavily feminised workforce. It also reduces pressure on hard-working families, enabling both workforce participation and improved work-life balance, particularly for women, who often shoulder a double care burden through the provision of informal unpaid care.

We are all ageing every day. To safeguard healthy ageing futures in WA, we must seriously consider what kinds of care we want and what responses are required to secure the caregiving and care workers needed in the decades ahead.

Two proposals

1. To develop a vibrant care economy, WA must create attractive care work careers, with better training and development opportunities, including collaborating with the Department of Home Affairs to develop care worker visa streams and settlement programs that can attract and retain professionals from around the world.

2. WA must harness new developments in social technology to build inclusive social support programs for older people to facilitate healthy ageing and address social isolation, including in regional areas. Investment in digital infrastructure and digital literacy training is needed to realise the promise of the WA Digital Inclusion Blueprint and protect the future of ageing in our digital-by-default world.

Further information

Scan this code to read about the UWA Social Care and Ageing (SAGE) Living Lab

uwa.edu.au/schools/Research/ SAGE-lab

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3   Royal Commission into Aged Care Quality and Safety, "Final Report: Care, Dignity and Respect", Vol. 1, (February 26, 2021), accessed January 27, 2022, https:// agedcare.royalcommission.gov.au/publications/final-report.

How can WA foster a culture of gender equity and inclusion in professional places?

Diane Smith-Gander AO
Past President, Chief Executive Women; Chair of UWA Business School Board

Libby Lyons
Chair of WA State Chapter, Chief Executive Women

To ensure WA is a thriving, sustainable economy and society in 2050, it is imperative that government, business and community take action to drive greater diversity in the economy through and for those who participate in it.** Currently, it is fair to say that not all Western Australians have an equal opportunity to succeed. To address the persistence of a 'blokey' culture, we need leaders in all sectors to embrace calls for action, with effective policy mechanisms to undercut the systemic bias, discrimination and harassment experienced by women in the workplace. Without this determined and driven action, half the State's population will continue to miss out on a 'fair go'.

From mine sites to boardrooms, women in WA are under-represented and experience the worst pay disparity rate in the nation.

The WA gender pay gap
While the national gender pay gap is 14.2%, the pay gap in WA is an unacceptable 21.9%.[1] On average, women in

WA earn $23,000 less than men per year[2] and in top-tier management, men are paid on average $100,000 more per year than women.[3]

Specific male-dominated sectors, such as the Australian mining sector, also have higher gender pay gaps (i.e., 17%)[4] which is significant for states like WA where mining is a huge part of the State's industry.[5] In effect, Western Australian women are absent from, and paid less in, most high-paying sectors and roles.

The leadership pipeline
There is also a big problem with the pipeline for women in leadership in WA. Fewer than 15% of graduates entering engineering-related operational roles are women.[6] This

1   Australian Bureau of Statistics, Australian Government, "Average Weekly Earnings", (May, 2021), accessed on January 21, 2022, https://www.abs.gov.au/statistics/labour/earnings-and-work-hours/average-weekly-earnings-australia/latest-release#data-download.

2   Workplace Gender Equality Agency, Australian Government, "(Finally) Equal Pay Day", (31 August 2021), accessed on January 21, 2022, https://www.wgea.gov.au/newsroom/finally-equal-pay-day.

3   Workplace Gender Equality Agency, Australian Government, "Gender Equity Insights 2016: Inside Australia's Gender Pay Gap", (2016), accessed on January 21, 2022, https://www.wgea.gov.au/sites/default/files/documents/BCEC_WGEA_Gender_Pay_Equity_Insights_2016_Report.pdf.

4   Australian Bureau of Statistics, "Average Weekly Earnings".

5   Workplace Gender Equality Agency, Australian Government, "Gender Equity Insights 2021: Making it a Priority", (2021), accessed on January 21, 2022, https://www.wgea.gov.au/sites/default/files/documents/BCEC%20WGEA%20Gender%20Equity%20Insights%202021%20Report.pdf.

6   Committee for Perth, "Filling the Pool", (June, 2015),), accessed on January 21, 2022, https://www.committeeforperth.com.au/documents/cfp-filling-the-pool-report.

reflects the extraordinary segregation of the WA workforce by gender, which is symptomatic of enduring and deep-seated views about women's and men's work.

Unless the perception of a society where men are perceived as leaders and women as at the service of men is changed, growth in WA's economy will be severely curtailed.

The remedy is simple. WA must eliminate the masculine-centred social and corporate culture. A longstanding association with the mining, energy and construction sectors, all of which are highly male dominated, is largely to blame.[7]

Equality of opportunity and outcomes in the WA workforce is imperative to building a state that will be able to overcome complex economic, social and environmental issues now and in the future. Given women in WA are better educated than men but so poorly represented in leadership,[8] it is evident that multiple and complex obstacles lie in the way of women's workforce participation, particularly in the pathway to leadership positions in both the public and private sectors.

The need for accessible ECEC

Access to appropriate, quality childcare is a key factor in any working mother's leadership pathway. In 9 out of 10 WA households, women are the 'primary carers' of children. There is an urgent need for accessible and affordable early childhood education and care (ECEC) services. A universal ECEC system is a keystone of societies that benefit economically and socially from women's ability to participate equally and progress in the

workforce. *The Filling the Pool* report (2015) identifies a 'perfect storm' which has led to ECEC services being difficult and expensive to access in WA.[9] There are fewer childcare facilities per capita in WA compared to any other state, and due to population growth, demand for ECEC services is increasing.[10]

As the State explores greater diversification of its economic base, there are many policy levers that the Government can implement that will guarantee more women move into leadership roles. There are too many to mention here but ensuring all policy and budget measures have an explicit gender impact assessment would be a very strong start.

Alongside a sustainable care sector and the implementation of fair and substantial Paid Parental Leave for women and men, the mining, energy and construction sectors (and the sectors which service them) must institute flexible work practices to enable women's participation in the State's highest-paying industries.[11] And of course, respectful workplaces are non-negotiable.

In WA, sexual harassment in the workplace is a huge problem and there have been encouraging commitments by government and business to address this issue, particularly within the resources sector. However, given the scale of the problem and the cost to the economy, more needs to be done.

Cultural change, which ultimately needs to begin with governance at the highest levels of the public and private sectors, is a precursor to — and will also result in — the kind of practical policy proposals that will ensure a more equal society and stronger economy in WA. It is critical that the

7   Committee for Perth, "Filling the Pool".
8   Department of Communities, Government of Western Australia, "2019 Women's Report Card: An indicator report of Western Australian women's progress", (2019), accessed on January 21, 2022, https://bcec.edu.au/assets/2019/09/115008_BCEC-DoComm-2019-Womens-Report-Card_WEB_FINAL.pdf

9   Committee for Perth, "Filling the Pool".
10   Committee for Perth, "Filling the Pool".
11   Committee for Perth, "Filling the Pool".

nation's leaders take responsibility for the cultural change required for WA to foster gender equity and inclusion in the professional realm.

The statistics reveal that WA lags the nation, in terms of progress towards gender equality and diversity and inclusion. There is still so much to do to address these issues in workplaces. WA must therefore introduce positive policy settings that encourage women's workforce participation. A diverse economy is key to WA growing into a thriving economy and society by 2050.

Two proposals

1. Support increased affordability of early childhood education and care (ECEC) at all levels of government (e.g., local government planning approvals to be amended, state school facilities to be multi-purpose and include ECEC).

2. The WA Government should introduce measures that require budget proposals to include a gender lens that specifies their impact on women, and task the WA Treasury to report formally on the aggregate gender impacts of budget proposals.

A response

"Tackling gender inequality is a priority for WA. Compared to gaps nationally, WA's gender pay gaps are larger amongst the highest and lowest-paid workers. It is tempting to think it is just a mining/construction problem, but in reality, it is also caused by discriminatory public sector policies."

Professor Alison Preston
Professor of Economics, UWA Business School

Promoting cultural plurality in WA

Dr Robert Wood

Creative Director, Centre for Stories

Moving towards a better WA by mid-century is going to take creativity and imagination. We must foster cultural plurality in how we are governed because it matters to all citizens here.

In the current conversation around culture, we are missing a more expansive dialogue on the Commonwealth Constitution that frames our citizenship. This Constitution helps to maintain a monoculture that undermines local expressions, relationships and sovereignties. It also fails to account for cultural plurality in WA and needs major reform to truly represent who we are as a state and what we have become since Federation all those years ago. That means rewriting it in a fundamental way.

My vision for a mid-century WA is one that places cultural plurality at the heart of the Constitution and the economy. It is one that affirms our ability to collaborate in light of our religious, class, racial, gender, sexual, historical and other differences.

We are better together when we truly recognise all our cultures, and this requires changes to law and funding to do so.

Two proposals

1. Constitutional reform that changes Commonwealth and State relations with this country's citizens, and that moves towards a Republic with an Australian head of state, treaties with First Nations people, and a bill of human rights for citizens. In this regard, an ideal reference point for Australia is South Africa's Constitution, which recognises that 'South Africa belongs to all who live in it, united in our diversity.'

2. A mineral resources tax levied by the State returned in entirety to cultural activities of Native Title holders. This is a way to facilitate heterogenous sovereignties within and between the many different traditional owners in WA. A good reference point is Norway's Government Pension Fund Global, which could be adapted for specific group cultural activities in Australia. Since its establishment in 1990, the Fund invests the surplus revenues of Norway's petroleum sector and this amounts to approximately 20% of the government budget.

Further information

Scan this code to read about the Norway Government Pension Fund Global

nbim.no/en/the-fund/about-the-fund/

Place

As a place, WA is atypical: large; mostly remote; reliant economically on a small number of sectors; often an after-thought in national policymaking perspectives; uniquely able to focus on the potential of the Indian Ocean region; remarkably rich in natural resources; has a uniquely rich and diverse natural environment vulnerable to climate change; and, relative to its recent past, boasts an increasingly ethnically diverse population.

This profile points to a host of policy challenges to which academic experts and seasoned practitioners are ideally suited to take on.

For instance, WA has undoubtedly experienced a low COVID-19 impact, aided principally by its remoteness and small, low-density population. Although it is not yet clear what is the best insurance against another crisis, increasingly healthcare and screening capacity on a 'just-in-case' principle must be a high priority. Expertise is sorely needed to identify future threats to WA's settlements, agriculture, environment and public health – any combination of which can threaten the State's medium-term future.

Creating a 'Big WA' will hang on finding a sustainable balance between Perth's growth trajectory and greater regional diversification. With limited water supplies and poor connectivity, the State will need to innovate and experiment in areas such as acute healthcare and access to tertiary education.

The clamour for growth will also have to be balanced with the State's fragile biodiverse environment. That might entail radically new ways to generate, store, distribute and consume energy for instance, and different ways to support communities in arid and semi-arid conditions.

Some of the pertinent topics in this chapter address questions such as:
- Protecting Aboriginal cultural heritage in the wake of recent setbacks and disasters;
- Anticipating and coping with aridity;
- Addressing protection challenges and development opportunities that arise from WA's unique bio-diversity.

Part 2

Place

Protecting Aboriginal cultural heritage: WA after the Juukan Gorge inquiry

Associate Professor Hannah McGlade

Bibbulmun Noongar; Associate Professor in Indigenous human rights, Curtin University; Member of the UN Permanent Forum for Indigenous Issues

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The Joint Standing Committee on Northern Australia's inquiry into the destruction of Indigenous heritage sites at Juukan Gorge offered some key recommendations in its 2021 report, *A Way Forward*.

It called for:
- a new national framework of Aboriginal heritage protection co-designed with Aboriginal people;
- the responsibility for Aboriginal cultural heritage, sitting under the Environment portfolio, to revert to the Federal Minister for Indigenous Australians; and
- a review of the *Native Title Act 1993* (Cth) to address inequalities in the negotiating position of Aboriginal and Torres Strait Islander peoples under the 'future act' regime.

The Committee was clear that this future work should recognise the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) and reflect the key principle of Free, Prior and Informed Consent (FPIC).

The Committee's report was precipitated by the shocking destruction of the Juukan Gorge cave, showing some 46,000 years of Aboriginal connection, by mining giant Rio Tinto.

In the wake of the destruction of the Juukan Gorge cave, and the Committee's report, the Western Australian Parliament passed new cultural heritage legislation in September 2021 that continues to prioritise established mining interests over Aboriginal cultural heritage protection.

The lessons that WA tells us – so soon, so clearly – is that we need the Commonwealth Parliament to move with urgency on the reforms of the Committee, but they also, once again, underscore the pressing need for constitutionally protected structural change, as called for in the Uluru Statement from the Heart.

New WA cultural heritage legislation introduced without adequate engagement with Aboriginal people

Aboriginal land councils and leaders rejected as superficial the State's consultation on the legislative reform and called for a co-designed process to allow for traditional owners to increase protection of heritage sites. One hundred and fifty Aboriginal cultural leaders and eminent Australians alike signed an Open Letter of Concern, which pointed out that the Bill was again weighted in favour of mining and economic interests over Aboriginal heritage and violated UN treaty law.

Regardless, only a year after the destruction of the Juukan Gorge cave, and a month after the Commonwealth Committee reported, the WA Parliament passed the Aboriginal Heritage Bill 2021 in the face of widespread opposition. It was also the subject of an emergency request to the UN Committee on the Elimination of Race Discrimination, which explained how the law entrenches systemic racial discrimination against Aboriginal traditional owners.

Significant concerns with the Western Australian legislation

The main concerns with the new Act relate to the ongoing role of the Minister for Aboriginal Affairs to grant approval to mining companies and developers to damage and

destroy heritage sites, over and in opposition to the wishes of Aboriginal custodians. Under the new Act, the final decision still rests with the Minister if the 'proponent' and traditional owners do not reach an agreement – little solace, as the Minister, has in the past, predictably provided mining companies and developers with permission to lawfully damage or destroy heritage sites, as occurred in relation to Juukan Gorge.

The new Act also adopts (and misuses) the language of international human rights law, indicating that Indigenous people must be given the opportunity to provide 'Free, Prior and Informed Consent' (FPIC) to the damage of sites, a right that is recognised in the UN Declaration on the Rights of Indigenous Peoples. The Act does not meet the test of FPIC, which requires an absence of any element of coercion, and the right to say 'no' to harm, damage or destruction.

Furthermore, although the Act gives non-Aboriginal proponents several opportunities to appeal decisions, for Aboriginal people, there is no merits review of the Minister's decision to approve the damage and destruction of Aboriginal sites. This disparity is racially discriminatory. It evidences a bias towards non-Aboriginal people and interests entrenched through the Act.

Lessons for the future

WA has so far made no meaningful attempts to respect Aboriginal peoples' rightful place as First Nations people in its constitutional arrangements or systems of governance. The constitutional amendment that has been achieved has fallen far short of structural reform that advances the interests of Aboriginal people in the State.

The Commonwealth Parliament has the power – including under the external affairs power – to override the *Western Australian Aboriginal Heritage Act 2021,* and lawfully ensure Aboriginal people's protection of heritage sites.

What happened in our State, to heritage lands and sacred sites, highlights our continued dispossession as peoples without recognised sovereignty and Treaty rights, at the whim of a state acting in concert with multinational mining interests. It shows the weakness of the State's reconciliation promise and symbolic constitutional recognition.

And it reminds Aboriginal people to continue to demand meaningful structural change, including at the Commonwealth level, where the ultimate power to make laws for Aboriginal people resides. This structural change is critical to the realisation of the UNDRIP, especially the right to our lands, ancient heritage and culture.

Two proposals

1. Official accountability and advocacy: the State had made a previous commitment to establish an Office of Aboriginal Accountability and Empowerment. It was, however, abandoned with no advice or explanation from the State. The establishment of this Office should be the next step in empowering Aboriginal people in WA.

2. Constitutional recognition and protection: in May 2017, Aboriginal and Torres Strait Islander people from across the country developed the Uluru Statement from the Heart and called for a process of structural reform expressed as 'Voice, Treaty and Truth'. WA must make a meaningful attempt to respect Aboriginal peoples' rightful place as First Nations people in its constitutional arrangements or systems of governance.

Further information

Scan these codes for further information:

Read the original version of this article published by *Australian Public Law*: **auspublaw.org/2021/12/western-australia-after-the-juukan-gorge-inquiry-little-solace-for-aboriginal-people**

A Way Forward – report on the inquiry into the destruction of 46,000-year-old caves at the Juukan Gorge in the Pilbara region of WA: **aph.gov.au/Parliamentary_Business/Committees/Joint/Northern_Australia/CavesatJuukanGorge/Report**

Aboriginal Cultural Heritage Act 2021: **wa.gov.au/government/document-collections/aboriginal-cultural-heritage-act-2021**

Uluru Statement from the Heart: **ulurustatement.org/the-statement**

Indian Ocean Rim:
Strategic priorities and vulnerabilities for WA

Sonia Arakkal

Policy Fellow, Perth USAsia Centre

The 'Indo' in Indo-Pacific has largely been secondary to Australia's contemporary strategic outlook. But demography, climate change, the energy transition and great power rivalry are likely to bring the Indian Ocean into focus by 2050. This has important implications for Australia's 'Indian Ocean capital' of Perth and the state of WA.

> To prepare for changing tides in the Indian Ocean Rim, WA should reorientate its trading relationships to the region and chart a unique role in the nation's response to a turbulent strategic landscape.

Four trends that will shape the Indian Ocean Rim

Shifting demography: The Indian Ocean Rim (IOR) is projected to house nearly half the world's population by 2050. This will largely be fuelled by population growth in Africa supplemented by growing populations in Indonesia and India. The demographic dividend will increase the economic, political, and strategic influence of these countries on the world stage and make them desirable economic partners.

Climate vulnerability: The Indian Ocean is warming at a higher rate than other oceans. IOR countries, Bangladesh, India, Vietnam, Indonesia, and Thailand will face the greatest effects of sea level rise due to large populations living in low-lying coastal areas. Experts warn that severe weather events could exacerbate the risk of large-scale human displacements and political instability; the IOR countries of Bangladesh and the Maldives are a present-day case in point.

Energy security: The energy transition will shape Indian Ocean geopolitics. Currently more than half of the world's sea-borne oil travels on Indian ocean sea lanes. At the heart of the geopolitical struggle in the Indian Ocean is the ability to protect key choke points connecting these sea lanes. As the world moves toward decarbonisation, there will be new winners and losers in the Indian Ocean. Countries that take advantage of new renewable energy technologies can expect to enhance their global influence and reach.

Great power rivalry: China's growing footprint and influence in IOR has made the contest for power and control in the region between China and the US and its partners significant. Through policies like the Maritime Silk Road, under Beijing's 'Belt and Road' Initiative, China's presence in the Indian Ocean has also become a source of shared anxiety for France, India and Australia. These countries are increasingly strengthening multilateral engagement through regional mechanisms and through increased defence activities in their Indian Ocean Territories.

Implications for WA

Reorientating WA's economic outlook: WA is in a prime position to capitalise on the emerging markets in the IOR. However, this presents a fundamental shift for a state that is more comfortable doing business in North East Asia (NEA) than in our own neighbourhood. While the resource sector underpinned relationships with Japan, Korea, and China, building partnerships in the IOR will require a more diverse range of industries. Given decarbonisation trends, clean energy export industries stand out. While contemporary demand necessitates a focus on NEA in industries such as hydrogen and critical minerals, to prepare for the mid-century, WA should start planning for IOR export markets.

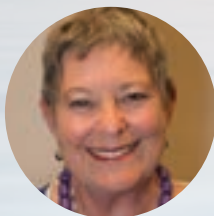**Moving WA beyond defence to regional engagement:** In response to rising strategic tensions in the Indian Ocean, WA's role needn't be limited to the defence sector. While WA's defence industries are important, the sector is largely dependent on Commonwealth spending and large military industrial players. In preparation for the geopolitical uncertainty of 2050, WA should delineate a role that brings advantages to the state, while advancing the nation's interests: for example, as an IOR regional engagement hub. Knowledge mobilisation and planning for shared vulnerabilities such as disaster resilience and climate-related challenges can find a home in WA while bringing tourism, investment, and State development benefits. This will give the State unique value in progressing the nation's strategic interests as regional cooperation will be critical to responding to great power rivalries in the Indian Ocean.

Two proposals

1. The Commonwealth has not yet formulated a comprehensive strategic view of the Indian Ocean region. WA Federal Parliamentarians, WA State Government and WA defence industries should lead the call for a Federal Indian Ocean Strategy which prioritises the State's unique role as a regional engagement hub.

2. The WA State Government should prepare to capitalise on emerging markets in the IOR, with a focus on a diverse range of industries beyond just the resource sector. With the global trend towards decarbonisation, clean energy export industries should form a central priority in expanding trade with our Indian Ocean neighbours.

A response

"A WA strategy for approaches to the region is now becoming more urgent, taking into account the changing elements described. Western Australian political and trade leaders should indeed encourage calls for an overall, integrated strategy. The really big task is for WA State political leaders and federal representatives to champion this in Canberra."

Dr Sue Boyd
Chair (WA), Foresight's Global Coaching; Immediate Past President of the Australian Institute of International Affairs (AIIA) WA

Technology and communication for the future prosperity of WA agriculture

Professor Kadambot H. M. Siddique AM

Hackett Professor of Agriculture and Director, The UWA Institute of Agriculture

Professor Wallace A. Cowling

Professor in Plant Breeding and Genetics; Associate Director, The UWA Institute of Agriculture

Agricultural exports boosted Australia's economy during the COVID-19 pandemic in 2020-21 allowing us to avoid major setbacks experienced in other advanced economies. At the start of 2022, agriculture represented only 0.3% of foreign direct investment in Australia, but this will increase exponentially over the next two decades as world demand for food increases. In 2021, there was a large rise in the global price of agricultural products exported from WA and these prices are expected to be sustained into the future. Agriculture is considered a highly attractive investment opportunity in Australia, and especially in WA where agriculture is driven by the export market.

However, agriculture in WA is highly dependent on external markets for inputs as well as exports, and production depends on favourable weather conditions. This makes agriculture vulnerable to changes in climate and global geopolitics. It is critical that WA moves fast to 'climate-proof, export-proof and input-proof' agriculture by developing innovative solutions to these limits on future production and profitability. Emissions reductions and the carbon economy will have an increasing role to play in agriculture in WA, which to some may seem a risk but to others an opportunity. These risks need to be managed through new marketing approaches and new investment in innovative technology and sustainable production.

Agriculture in WA is shifting towards large family enterprises and corporate farms driven by high returns on investment. This will increase the scale and vertical integration of farm businesses. Perceptive domestic and foreign investors will promote the adoption of new digital technologies for more efficient and sustainable production and transportation, and will develop close relationships with key export markets and customers who demand knowledge of the provenance and safety of food products.

> WA is Australia's largest agricultural exporter of unprocessed food. A major challenge is to increase investment in the food processing industry within WA and to export more processed foods over the next two decades.

Global markets currently prefer WA's 'clean and green' produce, and WA can potentially attract a large increase in international investment in agricultural production over the next two decades, if it can meet the increasing demands of global caps on carbon emissions, and avoid the serious potential impacts of climate change.

Investment in agricultural research and development

Public and private investment in agricultural research and technology has been a major driver of prosperity in the agricultural economy of WA over the past 100 years since the first mineral deficiencies were discovered and remedied in WA soils. The agricultural education system in WA has been a driver of this innovation. A classic example is the introduction of lupins and other legumes into WA cropping systems in the 1970s, which transformed wheat and sheep production through the addition of 'natural' nitrogen fertiliser from the bacterial symbionts in legume roots. The use of specific and targeted herbicides and conservation agriculture helped to boost crop yields by permitting earlier sowing of wheat, the liming of soils decreased the threat of soil acidity, and canola and other new crops entered the system and increased the stability of agricultural systems through diversity of species in the cropping system.

It is critical that WA increases investment in agricultural education and innovative research to help drive the agricultural economy forwards over the next two decades.

National and international forces at play

Powerful geopolitical forces, both nationally and internationally, have the potential to disrupt agricultural production in WA and globally over the next two decades. Trade opportunities may be disrupted by pandemics, trade wars or global climate political action outside the control of WA. However, WA also depends on national cooperation to expand opportunities in agricultural export and import markets. Political conflicts between states and the Commonwealth are increasingly hindering the development of international trade agreements that would be favourable for agriculture in WA. Compounding these difficulties, international consumer preferences are also changing, driven by macro trends in demographics, population growth and mass urbanisation, along with demands for convenience, provenance and social/environmental responsibility.

In the face of these changes, WA farmers will need to develop effective strategies for managing risk, including maintaining relatively high levels of equity, liquid assets and borrowing capacity, using inputs conservatively, diversifying across enterprises and locations and earning off-farm income.

The future of agriculture in WA

Let us consider key research and development (R&D) areas and government policy required to drive the future of agriculture in WA, underpinned by campaigns to improve public knowledge and awareness:

• WA agriculture has great opportunities to export clean and green products and to export our intellectual property in climate mitigation and adaption strategies in dryland agricultural ecosystems elsewhere in the world.
• The sector also needs to engage more with young people with skills and knowledge in technology, and become more involved in promoting their education through scholarships and employment opportunities.

• Furthermore, WA researchers should be trained in 'systems thinking' in agriculture to ensure that new technology is relevant to the whole system.
• Finally, WA agricultural research leaders should communicate their research outcomes in sustainable agricultural production to the WA and wider Australian and international communities.

Two proposals

1. On-farm greenhouse gas emissions threaten the export of WA agricultural produce as a result of global agreements for capping greenhouse gas emissions. Investment in R&D can reverse this threat and make WA the model low-emission agricultural production system for the world to follow.
   a. Develop practical methods to optimise production and significantly reduce methane emissions in WA sheep and cattle production.
   b. Increase research on reducing emissions from WA cropping systems caused by nitrogenous fertilisers and fossil fuels.
   c. Promote biodiverse carbon farming, soil carbon sequestration and natural capital accounting services.

2. Climate change threatens agricultural production and demands innovation in adaptation to new climatic conditions. Investment in R&D can develop heat- and drought-resilient crops, animals and agricultural systems.
   a. Develop practical methods to detect and mitigate the impact of heat stress and drought on the welfare and productivity of grazing ruminants.
   b. Apply genetic and molecular technologies to increase heat and drought tolerance in crops such as wheat, barley, canola, pulses and lupins.
   c. Ensure water security through innovative conservation and reuse.

A response

"Research-based solutions to ensure food and nutritional security, environmental sustainability and agribusiness ecosystems will require sustained investment in research, postgraduate teaching and training. Partnership with broader industry will ensure translation of research, and, together with the long-established innovation culture of WA primary industry, facilitate an enhanced contribution of agriculture to WA prosperity".

Terry Enright
Chair of Grains Australia, Chairman of the Wheat Quality Australia Board

Planning for a post-mining WA future

Professor Fiona Haslam McKenzie

Professor of Geography, UWA School of Social Sciences;
Co-Director, UWA Centre for Regional Development

WA and mining are synonymous. Mining has shaped how and where we live. The royalties derived from the mining industry provide this State with sophisticated infrastructure and services, and mining companies' sponsorship of the arts, sport and community services give Western Australians a quality of life we would miss if mining was no longer part of our economic profile. However, resources are finite. Planning for a post-mining future before mines close and leveraging the human capacity and technical skills of the mining sector to other productive uses will safeguard WA's social and economic wellbeing.

The Minerals Council of Australia calculates there could be as many as 65,000 abandoned mines across Australia. Even though mining companies are now required to pay a bond to avoid abandonments, stranded assets and deleterious environmental legacies, the social and economic costs of mine closure are incalculable. Planning for mine closure is therefore critically important.

To date, across Australia, there are few examples of mines that have closed and the land and/or other assets used for other productive purposes. There are multiple reasons for this. Planning for closure and repurposing takes time. The recently relinquished Lake Kepwari in Collie took more than 25 years to transition from a mine-pit lake to the beautiful, manmade recreational reservoir it is today, with many environmental hiccups along the way. The community of Collie is also on a transformation journey, planning to transition from a gritty mining town to one that has a diversified economy. There will be multiple towns and communities throughout WA that will face these challenges and ensuring there are positive outcomes post-mining requires commitment, time and capital long before closure is a reality.

Two proposals

1. The introduction of a mine closure and repurposing agency that sits across the State Government to co-ordinate mine closure plans, regulatory frameworks and succession planning for communities reliant on mining industries.

2. Government commitment to drive sophisticated manufacturing and value-add opportunities across regional WA, using the technical expertise and human capacity derived from the mining industries to maximise outputs from these two key sectors and optimise high value export.

Coping with
aridity

Professor Anas Ghadouani

Professor of Environmental Engineering,
UWA School of Engineering

Localised solutions to arid land

"What's missing from the conversation about water
management in communities are some localised solutions
that address and respond to the history of the place, the
characteristics – the biophysical – but also the social
dimension, the political dimension, the local environment…"

"Coping with aridity is really about developing a solution
that is suitable for that local community, that is wanted
by that local community, and that fits really within the
aspirations of those communities."

Scan this code to watch the full video.
youtu.be/kjeFVJ1lwpw

Securing WA's biodiversity for the future
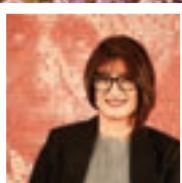
Associate Professor Parwinder Kaur

Associate Professor in Biotechnology, UWA School of Agriculture and Environment; Director, DNA Zoo Australia

Australia is a megadiverse continent, containing an array of plants and animals found nowhere else. As evidenced by the painful deaths of more than 1 billion animals in the Australian wildfires in 2020, the climate emergency leaves us with only a short time to characterise, record and support our unique biodiversity.

Southwest Australia, also known as the Kwongan, is therefore an old landscape with a stable climate.[1] It has not seen glaciers or ice for more than 200 million years. This has allowed species to evolve without the major extinctions seen elsewhere in the world.

The Kwongan with national parks, reserves and other conservation areas

WA's unique biodiversity is better understood thanks to the fortuitous combination of a globally competitive community of conservation geneticists and evolutionary biologists. These experts can harness world-leading advanced research infrastructure in next-generation sequencing and high-performance computing, supporting conservation efforts that reflect the Biodiversity Conservation Regulations (2018) that address flora and fauna. Beyond the current status quo, the spotlight is now on future emerging opportunities, such as synthetic biology and precise bioengineering that can be capitalised on. The promise of these fields was demonstrated in a spectacular way with the development of the mRNA vaccines, using synthetic RNA, for COVID-19. These new technologies offer a great potential in other fields of medicine, such as biosensors for diagnosis, personalised cancer vaccines, treatments for autoimmune diseases, and viruses that can be engineered to target antibiotic-resistant bacteria. In agriculture, this offers potential for everything from alternative forms of meat protein to biosensors for farm monitoring. For our significant environmental challenges, bioengineering could be the basis for new biofuels and industrial chemicals.

The key questions that need addressing are:

- How can WA drive the conservation and development of biodiversity for a fair and equitable sharing of the benefits of utilising genetic resources? A framework is critical to ensure public trust and safety through strong regulation and a set of agreed ethical principles.
- Are the relevant stakeholders able to connect the existing knowledge and resources within our State to add value to industries by enabling new products and biomanufacturing processes, which would underpin the growth of an economically and environmentally sustainable bioeconomy?

WA has built a strong and growing biotechnology and conservation research community. However, there is limited strategic alignment across different state universities, key government bodies and industry stakeholder groups. With national policies such as the Modern Manufacturing Strategy emphasising opportunities that could be unlocked by modern approaches, now is the time to coordinate government,

1.   Stephen D. Hopper, "OCBIL theory: towards an integrated understanding of the evolution, ecology and conservation of biodiversity on old, climatically buffered, infertile landscapes", *Springer Science + Business Media*, (14 July 2009), accessed January 26, 2022, https://www.web.uwa.edu.au/__data/assets/pdf_file/0017/612161/Hopper_2009_OCBIL_theory.pdf.

industry and research thinking around WA's strategy. These are timely questions given advances in knowledge and a growing appetite to lead in policy.

There is a case to identify smart and fit-for-purpose policy, regulation and economic models that can unlock the biotechnology opportunities through conservation and bioprospecting development with public, private and community partnerships.

A strong biotech sector is needed

Australia is one of the world's 17 biodiverse countries and the Australia National Biotechnology Strategy underpins the importance of a biotech sector nationally and within the State. This aims to go beyond the conservation of flora, fauna and ecosystems, and instead takes a deep dive into DNA data that can unlock new frontiers for the growing biotechnology industry. WA has the opportunity to lead State-based initiatives that build upon the Australia National Biotechnology Strategy. This in turn could play a leading role in servicing the growing Asia-Pacific market for synthetic biology-enabled products, expected to reach $3.1 billion by 2024.

The biotechnology sector in WA is growing and marrying conservation with development of biodiversity and biotechnology industries.

Two proposals

1. While bioprospecting regulations exist, these largely focus on the conservation of flora and fauna. These regulations need to cover the wealth of data that can drive development opportunities relating to not just species, but those of novel compounds, bacteria and characteristics.

2. WA needs a common body of knowledge and a roadmap outlining a collaborative approach that kickstarts a State-based conversation on biodiversity to deliver a world-leading conservation and development strategy (e.g., 'WA State of Mind: Bio-Diversity Conservation and Development').

The DNA Zoo project[2] is a collaboration between academic labs, conservation bodies and zoos across the globe. The purpose of DNA Zoo Australia is to facilitate the comprehensive sampling of Australasian biodiversity, including vulnerable and threatened species, and to enhance knowledge of the extinction risk for Australian species to inform sound policy and management decisions.

2.   See https://www.dnazoo.org/.

Designing a healthcare system to deliver a healthier future

Dr Omar Khorshid

Federal President, Australian Medical Association

I f you ask any Western Australian what is most important to them, you'll almost universally get the same answer – my health, and the health of my family. Yet before COVID-19, health was not the most important topic of the media, nor was it the central focus for our governments and politicians.

At a population level, we have kept our health through the pandemic largely by keeping our distance from each other, and the rest of the country. But that approach won't solve all the other health issues Western Australians face. Those who are 65 years and older represent approximately 14% of the WA population but accounted for 43.5% of public hospital patient days in 2019-20. As our population continues to age, we are clearly going to need to reform our health system to meet the demand of our community. Yet currently our hospitals cannot cope with the demand – even with no, or low COVID-19 cases – and that problem will only get worse without intervention.

> We need to address future healthcare demand, by helping people live healthier lives to begin with.

We need to revitalise our prevention agenda, develop models of funding better care, and new technology for more personalised medicine. Otherwise, we will continue to face a longer wait for an ambulance, then more time waiting in an ambulance, in the emergency department, and for any necessary surgery. That is not something we should accept for our most important possession.

Two proposals

1. Start with a funding agreement that gives hospitals a fighting chance, while holding our Federal and State Government to account. A new funding model would allow hospitals to look beyond their walls and keep people healthy in the community, give them enough beds while encouraging innovation and performance improvement, and ensure they have the tools to achieve this change.

2. Fund primary care so that our GPs can provide continuous care that is collaborative and leverages telehealth, rather than funding care based on outdated episodic and face-to-face models. It's time health funding caught up to the technology available, and the needs of the community.

Further information

Scan this code to read the Australian Medical Association's report, *Public Hospitals - Cycle of Crisis*

ama.com.au/public-hospitals-cycle-of-crisis

Making WA resilient to infectious disease threats through information technology

Professor George J. Milne

Professor in Computer Science and Software Engineering,
UWA School of Physics, Maths and Computing

The COVID-19 pandemic has shown how Australia is heavily connected to Southeast Asia, and directly exposed to the rapid spread of new pathogens via the growth in air travel. This is a situation not experienced with prior pandemics. Historically, human transmissible viruses have appeared in this region of Asia and in central Africa, often moving from animal species and becoming transmissible between humans. New influenza strains, SARS and Ebola are examples.

UWA was fortunate in having infectious disease modelling capability and expertise at the start of the COVID-19 pandemic. This computer-based infrastructure was used to predict the scale of healthcare resources, ICU beds and ventilators needed in a worst-case COVID-19 outbreak scenario, and to guide resourcing by WA Health. Similarly, modelling was conducted to determine optimal social distancing interventions required to arrest the SARS-CoV-2 virus spread. But what if this expertise had not been available in January 2020? What COVID-19 has shown is that developing mitigation policy and optimal response measures during a pandemic may not be feasible given the rapid increase in case numbers, hospitalisations and deaths resulting from highly transmissible viruses, such as the Delta and Omicron COVID-19 variants. Epidemic response policy needs to be developed and tested in advance of future epidemics.

Two proposals

1. Given the future likelihood of epidemics and pandemics, WA needs to have expertise in place with the capability to accelerate interventions and respond to new infectious disease threats in real time. This involves developing computer-based simulation models to determine optimal response strategies ahead of a future epidemic and conducting extensive simulation exercises on how human and technology resources may be rapidly activated in response to such threats.

2. To strengthen our ability to respond, we need to develop computer-based technologies to model infectious disease spread and to inform response strategies such as vaccination, and to use these technologies to evaluate the effectiveness of a range of mitigation approaches. WA needs a corps of skilled infectious disease modellers conducting ongoing research in this field, and to be ready to scale-up analysis actions when required. Having available human capital and software infrastructure will strengthen our health systems and mitigate threats to our economy.

Further information

Scan these codes for more:

George J. Milne, Julian Carrivick and David Whyatt, "Mitigating the SARS-CoV-2 Delta disease burden in Australia by non-pharmaceutical interventions and vaccinating children: a modelling analysis", *BMC Medicine*, Vol. 20, (2022), accessed on Feb 23, 2022.

bmcmedicine.biomedcentral.com/articles/10.1186/s12916-022-02241-3

George J. Milne, Simon Xie, Dana Poklepovich, Dan O'Halloran, Matthew Yap and David Whyatt, "A modelling analysis of the effectiveness of second wave COVID-19 response strategies in Australia", *Nature* (2021), accessed on January 15, 2022.

nature.com/articles/s41598-021-91418-6

Building sustainable capacity in WA's public hospitals

Dr Rhonda Kerr
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Professor Warren Kerr AM
Adjunct Professor, UWA School of Design

What can we expect of healthcare by mid-century? We can confidently say Western Australians will continue to expect ready access to quality healthcare in clinically appropriate settings when it is needed.[1]

Yet COVID-19 has revealed issues regarding the capacity of our hospitals from longstanding under-investment, resulting in fewer public hospital beds in WA (per 1,000 population) than elsewhere in Australia, and fewer ICU beds in WA (per 100,000 population) compared to other Australian states, the national average and at half the OECD average ratio of beds.

Capacity issues are evident with frequent ambulance ramping at emergency departments, lengthening waiting lists for surgery, and issues of system connectedness with aged and disability care patients unable to be discharged from public hospitals to appropriate care. Inequalities of access to hospital beds and to public ICU beds can be seen as a consequence of a state system of restricted supply, institutional investment, and prioritised planning.[2]

> International evidence indicates best-practice investment in hospitals aligns capital cost payments to each patient episode of care. Patient-based capital funding effectively delivers patient access to appropriate care in efficient hospitals.[3]

Patient-based operational funding for hospital care has operated in Australia for 25 years but capital funds for investment in hospital buildings and equipment has been restricted, prioritised and subject to State Budget considerations.

Average public hospital beds per 1,000 and ICU beds per 100,000 population
Australia, states, territories, and OECD average, 2020-2021

	WA	Australia	OECD	NSW	Vic	Qld	SA	Tas	ACT	NT
Public hospital beds*	2.2	2.7	4.7	2.56	2.27	2.53	2.59	2.75	2.7	3.97
Public + Private ICU beds**	6	8.5	12	10.8	8.1	7.9	9.1	7.1	8.6	9.7

*   Sources: Australian Institute of Health and Welfare, Hospital Resources 2019-20 Table 4.6; OECD Statistics 2021

**   Sources: Litton, et al, "Surge capacity of Australian intensive care units associated with COVID-19 admissions", *Medical Journal of Australia*, (6 April 2020). Box 1 ICU beds in 194 public and private ICU's in Australia in 2020 and 2021, OECD Statistics 2021.

1   Council of Australian Governments (COAG), "Heads of Agreement between the Commonwealth and the States and Territories on Public Hospital Funding and Health Reform", (2018), accessed January 22, 2022, https://federation.gov.au/about/agreements/heads-agreement-between-commonwealth-and-states-and-territories-public-hospital.

2   Rhonda Kerr, Delia V. Hendrie, and Rachael Moorin, "Investing in acute health services: Is it time to change the paradigm?", *Australian Health Review* 38(5) (August 2014): 533-40, accessed January 22, 2022, https://doi.org/10.1071/AH13226.

3   Rhonda Kerr, Delia V. Hendrie, "Is capital investment in Australian hospitals effectively funding patient access to efficient public hospital care?", *Australian Health Review* 42(5) (October 2018): 501-513, accessed January 22, 2022, https://doi.org/10.1071/AH17231.

The three great challenges

In addition to resolving capacity problems, three major challenges face public health and hospitals in WA:

1. Medical research recognises climate change as a major risk to the health of Western Australians due to a range of factors, including increased temperatures, fire risk and mosquito-borne disease.[4]

2. In this decade, adjusting hospitals and health-delivery systems to be sustainable for our workforce – environmentally and fiscally – is a significant challenge. The health sector is estimated to generate 5.5% of national greenhouse gases mainly from hospital facilities, medical goods and pharmaceuticals. Key WA health system sustainability issues have been recognised,[5] and specific programs will be required to reduce the carbon footprint of WA hospitals.

3. Equitably distributing new clinical practices and technologies in WA hospitals requires a dynamic system responsive to change. Implementing a state-wide system for electronic medical records in every hospital, and comprehensive diagnostic and treatment systems including genomics for precision medicine, pose challenges for a system of hospital investment that has an institutional, rather than a patient, focus. Auditor General reports and special inquiries challenge the effectiveness of national capital distribution for clinically important technologies.

International experience and the lessons of COVID-19 are that capital investment for future hospitals needs to respond to:
• capacity planning based on actual and emerging patient requirements rather than assumptions, institutional priorities and the limitations of individual state budgets;
• effective service delivery aligned with sustainable clinical care for both the workforce and the environment;
• changes in technologies and clinical capabilities;
• research-based clinical care standards rather than extrapolations of past experiences.

These challenges are common to every Australian jurisdiction. To meet community expectations of improved patient access and support effective and sustainable clinical care, our system for funding and building public hospitals will need to be more responsive at the patient level.

Unlike most OECD nations Australia does not have a national hospital capital funding system to build the capacity of public hospitals, maintain technological relevance, make hospitals sustainable and deliver patient access to appropriate care.

Generally, the operational costs of public hospitals are shared 50:50 between the Commonwealth and each of the states and territories. However, capital funding to build capacity remains solely a state responsibility.

Access to resilient public hospitals relies on the joint action of the Commonwealth and the WA Government to deliver effective healthcare by mid-century.

Two proposals

1. Implement a national system of funding for public hospital capacity to enable every Western Australian hospital to build capacity by aligning capital funds (for buildings and medical technology) with the needs of their patient population. Capital funding for public hospitals should be shared between the Commonwealth, and each state and territory, similar to other public hospital funding.

2. Implement a transparent system of capacity funding for public hospitals designed to meet the challenges of environmental sustainability, technological and clinical improvements. Ensure continuous improvement of technology at each hospital by funding capital costs through alignment with patient needs and contemporary clinical practice, rather than depreciation.

4   Paul Beggs, et al., "The 2021 report of the MJA–Lancet Countdown on health and climate change: Australia increasingly out on a limb", *Medical Journal of Australia*, 215(9) (October 2021): 390–392, accessed January 22, 2022, https://doi.org/10.5694/mja2.51302.
5   Tarun Weeramanthri, "Climate Health WA Inquiry: Final Report", Department of Health, Government of Western Australia, (2020), accessed January 22, 2022, https://ww2.health.wa.gov.au/~/media/Corp/Documents/Improving-health/Climate-health/Climate-Health-WA-Inquiry-Final-Report.pdf.

Augmenting WA's city design and infrastructure for mid-century population increase

Dr Kate Hislop

Senior Lecturer in Architecture; Dean and Head of School,
UWA School of Design

Another million people increases WA's current population by over a third, or approximately five additional Peel Regions. Data by the Australian Bureau of Statistics suggests that we will live longer, have a higher median age and a marginally smaller workforce. Almost a third of WA's residents will be overseas-born, and growth will continue to rely more on internal and overseas migration than on natural population increase. The proportion of Western Australians identifying as Aboriginal or Torres Strait Islander will be above the national average. A slow rise in educational status is likely, and increasing secularity will parallel declining levels in Christianity.

A larger, older, more secular and diverse population should be reflected in the design and infrastructure of our cities. Structures and systems should be durable yet adaptable or, on the other hand, temporary and recyclable. Either way, this versatility will accommodate intergenerational growth, change and continuity.

WA's built environment has always reflected overseas influence, though it has recently showed enhanced local awareness with respect to the design of urban landscapes. The pandemic, too, has highlighted the economic, cultural, environmental and health-related factors (and tensions) that are central to global and local considerations of how and where we will live, learn, work and age.

What changes are needed in the next two decades to safeguard the endurance of WA's cultural, ecological, spatial and climatic advantages? Urgent action is required on intersecting needs: to decarbonise the construction industry and tackle the 25% of greenhouse gas emissions that come from buildings; to ameliorate the damage to WA's unique biodiverse ecologies and landscapes; to improve housing affordability and reduce homelessness; and to adopt a mindset shift towards stewardship and care for Country. With construction being a major economic stimulant, there is a chance to expand employment opportunities across the sector that prioritise these concerns.

Two proposals

1. Encourage distributed consolidation and challenge the disproportionate dominance of the greater Perth metropolitan area by rejuvenating regional WA. Outside of Perth, WA's 10 largest nodes together currently comprise just under 450,000 people. Doubling this number within density targets could invigorate a linked network of regional cities buoyed by employment, educational, cultural and lifestyle opportunities; this would be enabled by renewable energy, expanded choice of housing options, and advancement in technologies to support flexible living and working.

2. Pursue adaptive reuse and creatively repurpose buildings and the sharing of space to overcome the under-utilisation of much urban and suburban built fabric. Design and occupation of adapted buildings should observe sustainability measures and principles of the circular economy, such as the sharing, reuse and recycling of spaces and assets. Most importantly, this would facilitate an upskilled design and construction workforce. The economic benefits of an augmented construction industry would simultaneously support a culturally enriched built environment.

Modernising aviation to meet mid-century needs

Kevin Brown
Chief Executive Officer, Perth Airport

The COVID-19 pandemic has retaught us the importance of connections – business, economic, social, cultural. Most of all, it was the loss of human connection during the pandemic that had the most lasting impact. Aviation connects people.

WA's geographic location puts us on the doorstep of the growth markets of Asia and within a direct flight to Europe. Our vast resource-rich land mass and disparate regional and remote communities demand efficient connectivity. Aviation will help us meet these needs and capitalise on these opportunities for decades to come.

If we are to diversify our economy and move away from the boom-bust resources cycle, then aviation can deliver increased tourism, more international students, greater numbers of business and conference travellers, and new opportunities for our fresh produce exporters. We will see more direct international flights, partly because of a reaction by travellers to COVID-19 but also as aircraft design allows for longer haul flights from Perth to Europe and the United States.

> With an increasing focus on decarbonisation, we will see an acceleration in biofuels by mid-century.

We will need industry and Government to lift the horizons of their thinking. Even with international and interstate flights severely reduced during the pandemic, our runways were at or near capacity during peak hours. Our State cannot afford to go into the next decade without a new parallel runway that guarantees future capacity.

Regrettably, the narrow focus appears to be reaping the greatest financial gain from the current boom rather than focusing on what we will need to deliver future growth and prosperity. We need to change this mindset if we are to allow aviation to deliver the future for Western Australia.

Two proposals

1. The development of a new parallel runway at Perth Airport that enhances WA's capacity to meet future flight demands with increased tourism, more international students and greater numbers of business travellers.

2. In addition to enhancing airport capacity, a successful future for aviation in WA requires a strategic approach to developing its direct flights to near and distant locations within the Indo-Pacific region that will best support future trade, education and cultural ambitions.

Taming suburbanisation

Associate Professor Paul J. Maginn

Associate Professor in Urban Planning and Geography,
UWA Department of Geography and Planning

The suburbs loom large in the imaginations of Australians. It is arguably the most common unit of geography within Australia and a marker of peoples' social status. For example, the western suburbs in Perth or the eastern suburbs in Sydney or Melbourne are signifiers of wealth and privilege. Conversely, the so-called 'KGB' in Perth's northern suburbs is stereotypically associated with social disadvantage, cultural minorities and refugees.

Perth is without question a *suburban* city. This is reflected in the dominance of single-family dwelling homes (approximately 80% of total housing stock) and households spread across the metropolitan region that now stretches 150 kilometres along the WA coastline. Notably, Australia's 'most liveable city', Melbourne, is also predominantly suburban in morphological and demographic terms.

Put simply, the suburbs matter because that's where most Australians live and because this is where political power (i.e., votes) dwells, albeit quietly.

Historically, the suburbs have tended to be overlooked by politicians and policymakers; the outer suburbs have suffered from an infrastructure and employment opportunities deficit relative to the CBD and inner-urban surrounds. Despite this, thousands of Western Australians continue to move to the suburbs every year. Suburbia is still seen as a space of opportunity, a place to not only realise the great Australian dream of home ownership, but also as an escalator to wealth accumulation and social mobility.

Australian planners have been trying to contain the suburbanisation of metropolitan regions since the 1970s with the emergence of the environmental movement and the idea of sustainable development. During the 1980s and 1990s there was a concerted policy push in metropolitan planning strategies to limit suburban expansions via planning ideas such as urban growth boundaries, and new urbanism and transit-oriented developments (TOD) in order to enhance densification and create integrated mixed-use spaces serviced by public and active transport.

In Perth, planning efforts aimed at taming suburbanisation have been in vain. For sure, TODs have been built but these are few and far between. There has also been a surge in the *apartment-isation* of inner-urban areas of Perth over the last decade. Meanwhile, suburbia has continued its outward growth.

The COVID-19 pandemic, along with Commonwealth Government policies such as the Homebuilder and Family Home Guarantee programs, have spurred greater demand for suburban housing. The WA State Government's $750 million Social Housing Investment Fund is likely to produce higher density social housing in suburban locations due to lower land values.

Amid this backdrop, policy efforts to stop suburbanisation are futile.

A more productive policy approach would be to work with the grain of suburbanisation by informing suburbanites and developers about the economic, social and environmental benefits – at the household, corporate and societal levels – of integrated smart suburbanisms.

That is, policies and initiatives designed to produce: (i) more sustainable homes (e.g., no black roofs and more natural ventilation); and (ii) greener suburbs (e.g., develop micro-grids and battery farms based on renewable energy sources and grey water recycling for use on public open spaces, verges and gardens). This will help suburban households reduce the life-cycle running costs of their homes, thereby freeing up money that could be used to pay off their mortgages quicker. A suburban greening strategy that gives emphasis to increasing tree canopy will be instrumental in enhancing not only environmental amenity, but also reducing urban heat island effects and enhancing wellbeing.

In the era of COVID-19, there is an imperative for all Western Australians to become more informed and responsive to the challenges and threats – for example, zoonosis (i.e., diseases that can be transferred between animals and humans), water supply, and loss of bio-diversity – that are likely to emerge as the metropolitan region continues to grow outwards.

Ultimately, there is a need for a more rapid and concerted adoption of such policies in order to ensure an economically, socially and environmentally prosperous WA for 2050.

Two proposals

1. A dedicated suburban infrastructure future fund (SIFF) to ensure the adequate and timely provision of sub-regional hard/soft infrastructure services (e.g., health and education services, renewable energy-based micro-grids and battery farms), plus investment funding for employment hubs that foster growth in advanced technologies, diverse and creative employment bases, as well as enhanced transport infrastructure to support e-mobilities and active transport.

2. A review and overhaul of State Planning Policy No.3 (Urban Growth and Settlement) 2006 to include a suite of planning standards for suburban subdivisions on issues such as tree canopy, suburban greening, water recycling, solar energy, ventilation and walkability, to reduce suburban heat, household energy and water bills and enhance health and wellbeing. Funding to support such initiatives would come from the SIFF.

Culture and creativity – knowledge, place and connection

Jeremy Smith

Senior Producer, Performing Lines WA; Board Member –
Chamber of Arts and Culture WA, pvi collective

Culture is inherently about who we are and how we live collectively. As more complex challenges face society, we must turn to cultural values to inform critical decisions that help us move forward. Respect, empathy, communication and imagination are creative practices that are important across all challenges. Art is an expression of that culture, providing a way of reflecting ourselves, exploring ideas and engendering debate. Art connects us in difficult moments, not only in theatres and galleries across our State, but also in backyards, local parks and community centres, where artistic and cultural practices thrive.

The economic impact and benefits of artistic projects are often reflected in conversations about project funding and evaluation frameworks. Of course, this is important, as it is often public (albeit limited) funding that is being used. We all need to recognise and acknowledge the economic benefits and impacts, but we should never lose sight of the importance of arts, culture and creativity to exist independently in their own right, for their own purpose, for everybody.

My experiences inform and underpin my values on this topic. I've worked in state and government arts-funding agencies and arts organisations that survive on grants, sponsorship and donations. I've spoken at conferences in Europe about 'art in rural areas' and have worked to place art at the centre of cross-sector partnerships delivering

outcomes for a wide range of key social areas, including regional development, mental wellbeing, youth, people with disabilities, place-making and celebrating diversity. Community arts is an important area of practice featuring diverse communities developing their cultural traditions and practice, working with professional artists to self-determine and express their own artistic or creative identities. It also facilitates the telling of important stories – on mainstages across the country, to large audiences.

Forging a cultural identity for WA

Despite the immense size of WA, our small and dispersed population means we do not have the large clusters or hubs of creative organisations driving what is measured economically as the 'creative economy'.

Statistics from the 2016 Census show that, over a five-year period, WA's creative industries grew by 0.7% per year compared to a national average of 2.2%. WA clearly lags behind the rest of Australia and the world in the growth of a creative economy. Other countries, however, have seen advancement in this area, outstripping other segments of economies over the last decade.[1]

1   Rachel Smithies and Jackie Bailey, "WA creative industries: An economic snapshot", (BYP Group , 9 September 2019), accessed January 26, 2022, https://www.dlgsc.wa.gov.au/docs/default-source/culture-and-the-arts/research-hub/creative-industries/wa-creative-industries-an-economic-snapshot.pdf.

Economics are only one measure. Looking beyond that, WA needs to forge its own cultural identity based on three opportunities:

1. A culture and knowledge-system deeply embedded in the land we now call Australia that stretches back 60,000 years.

2. Our position on the Indian Ocean Rim with growing cultural connections to Asia.

3. A new age of global connectivity allowing us to preserve the local while participating in worldwide conversation.

An Aboriginal Cultural Centre in Perth

In February 2021, the WA Government committed to an Aboriginal Cultural Centre to be built in Perth. This should be a keystone to building our State as a leading national centre for Indigenous knowledge. Promoting a better understanding of the intrinsic value of these knowledge systems – and how they will inform responses to climate change, human rights and social systems – is crucial, and should be led by First Nations people.

A view forwards

The next two decades will be important as WA reinvents itself from an economy dominated by mining and primary industries to a more diverse range of activities, including growth of the service, creative and knowledge sectors. The WA Government has identified creativity as a key skill for future work,[2] yet there is no focus on how to develop this within our education framework.

2   Department of Jobs, Tourism, Science and Innovation, Government of Western Australia, "Diversify WA: July 2019 – July 2021". See another example here: Stephen Lamb et al., "Key skills for the 21st century: an evidence-based review", (Victoria University and CIRES, August 2017), accessed January 26, 2022, https://inventorium.com.au/wp-content/uploads/2020/06/Key-Skills-for-the-21st-Century-Analytical-Report.pdf.

At a social level, arts and cultural practice has improved mental health, social connectedness, cohesion and resilience. We need these tools to ensure WA's cultural diversity and access for people of all abilities continues to be a strength, and we remain a compassionate society in the face of these anticipated changes.

Two proposals

1. Grow connections between our population and the Indian Ocean Rim through sustained and meaningful cultural exchange. One third of the world's population lives in Southeast Asia and we need greater cultural and linguistic literacy to support regional co-operation. Arts and culture form a vital part of soft diplomacy, and WA should be the natural base to grow this alongside trade relationships. Many artists have blazed their own trails across the region, establishing and managing residency and exchange programs independently. We need to bolster existing initiatives with additional funding and strategic support to broker new connections and partnerships.

2. Build technology infrastructure and competency allowing us to develop unique content and connections to the world. Recently increased digital capability and bravery places the sector in a unique position. Our expertise in digital creativity has thrived with small budgets – increased investment and partnerships have potential to broaden the impact into other sectors of the economy, such as health, design and manufacturing.
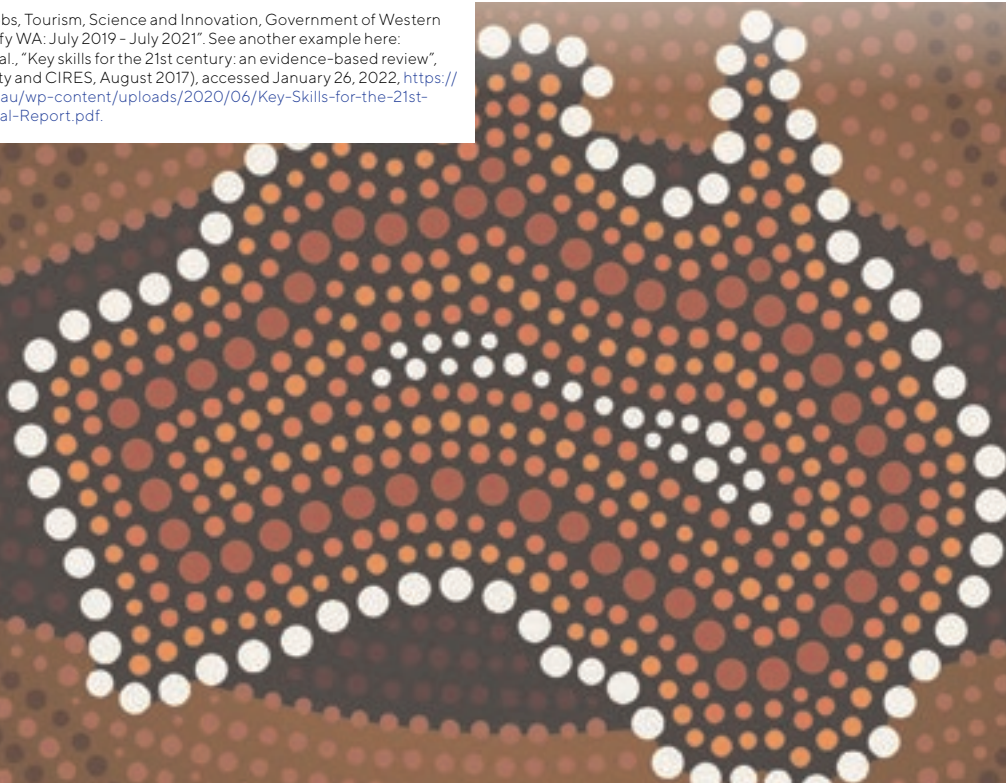
Preparing WA's social infrastructure for the next 20 years

Kate Chaney

Director, Innovation & Strategy, AnglicareWA; Director, Next25

How many children should we allow to live in poverty? Do we want more prisons and hospitals or fewer people in them? These are the questions we need to answer if we are to create the social infrastructure needed for a better life and more connected communities by mid-century.

'Social infrastructure' refers to the facilities, spaces, services and networks that support the quality of life and wellbeing of our communities.[1] To respond to emerging forces and opportunities, we need to think differently about our social infrastructure. We must set an ambitious vision for Australia, rather than simply extrapolating the status quo.

Non-GDP measures of success

Beyond a certain level, GDP is a poor measure of the things that matter. Economic growth based on extractive or non-circular activities cannot continue indefinitely. Wealth inequality is a better predictor of future social challenges than GDP.[2] Whether we follow New Zealand's wellbeing budget,[3] or use other measures of happiness,[4] we need to start having the conversation about what

successful communities look like so we can plan how to get there.[5]

Using data for preventative investment

Preventative investment is essential to social infrastructure planning.[6] For example, social housing may appear to be an expensive early investment, but it can change the trajectory of people's lives. Not only does it improve lives, but it also provides a value-for-money spend to the State by lowering demand for expensive downstream support systems (justice, unemployment, homelessness, etc.). Similarly, paying a liveable welfare payment may seem expensive, but reduces the need for numerous expensive and less effective crisis supports.

Over the coming decades, we will have new tools at our disposal: integrated data from multiple sources, combined with increased (AI-supported) analytical capacity.

Some 94,000 children live in poverty in WA due to the inadequacy of current support mechanisms and measures for identifying at-risk children.[7] Population data can give us an understanding about how broad interventions can shift trends (e.g., how having secure housing influences life outcomes). The use of linked data between the

1   Infrastructure Australia, Australian Government, *An Assessment of Australia's Future Infrastructure Needs*, (August 2019), accessed January 21, 2022, https://www.infrastructureaustralia.gov.au/publications/australian-infrastructure-audit-2019.

2   Kate Pickett and Richard Wilkinson, *The Spirit Level: Why Equality is Better for Everyone*, (Penguin Press, 2011), accessed January 21, 2022, https://www.penguin.com.au/books/the-spirit-level-9780241954294.

3   The Treasury, Government of New Zealand, *Wellbeing Budget 2021: Securing our recovery*, (May, 2021), accessed January 22, 2022, https://www.treasury.govt.nz/publications/wellbeing-budget/wellbeing-budget-2021-securing-our-recovery-html.

4   "World Happiness Ranking 2021", accessed January 22, 2022, https://countryeconomy.com/demography/world-happiness-index. Also see https://ophi.org.uk/policy/gross-national-happiness-index/.

5   See Jessica Fuller and Hollie Cheung, *Next25 Recoded: Understanding and improving how Australia makes its future*, (vol 1, ed.1 November 2021), Next25, accessed January 22, 2022, https://apo.org.au/sites/default/files/resource-files/2021-11/apo-nid315140.pdf.

6   Infrastructure WA, *Foundations for a Stronger Tomorrow: State Infrastructure Strategy*, (July 2021), accessed January 22, 2022, https://infrastructure.wa.gov.au/foundations-stronger-tomorrow.

7   Shae Garwood, Wendy Simpson and Myles Kunzli, *Reducing Poverty and Improving Child Development in WA*, (October 2021), AnglicareWA & Ngala, accessed January 22, 2022, https://www.anglicarewa.org.au/childpoverty2021.

Departments of Health, Justice and Communities can make these choices more explicit and create a new level of accountability in public policy.

In the decades leading to 2050, our use of data must become more sophisticated and targeted, to support the provision of earlier interventions. As well as being more effective, this will reduce the need for investment in expensive crisis infrastructure, such as prisons and hospitals.

Reinventing the industrial social care model

Last century, we created a standardised, centralised one-size-fits-all welfare system, designed to deal with occasional troubles, not the endemic consequences of persistent inequality.[8] This system has achieved great things, but it has run its course. More recently, it has been shaped by the assumption that humans are greedy and selfish and will try to maximise their resources. This creates mistrust and moral judgements, which means that much of our support system is transactional and siloed, with an emphasis on proving 'eligibility' and waiting until things are 'bad enough' before intervention.

Well before 2050, we need to have shifted from an industrialised social care paradigm, to put the 'human' back in human services. We need to redesign our support system to recognise that human relationships are at the core of transformational change.[9]

Our new support system must place a higher value and status on caring roles, including a wide range of currently low-paid/unpaid, professional and informal 'helping' jobs, encompassing everything from nursing to childcare, community services and even parenting. We will see growth in this 'heart' work,[10] as automation disrupts 'head' and 'hand' work. Recognising and rewarding care work has a double benefit: it provides meaningful employment in an age of automation and builds the fabric of our communities, leading to greater wellbeing.

By 2050, we must be using integrated data to identify the most effective broad-scale and personalised early interventions to ensure everyone gets a fair go, to support flourishing webs of relationships across our communities and to optimise the things that humans care about the most.
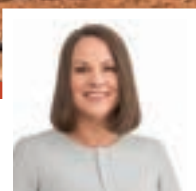
Two proposals

1. Adopt a wellbeing framework to guide policy decisions. Successful communities value a broad range of things: health, education, suitable housing, quality education, dignified work, personal safety and financial security, an equitable justice system, quality healthcare and the natural environment. Too often, GDP or economic impact is used as a proxy. By agreeing to a broader set of measures for policy success that takes into account individual and social wellbeing, we can better invest in jobs and social infrastructure that contribute to flourishing lives.

2. Use integrated data for preventative social infrastructure investment. By linking data between the Departments of Health, Justice and Communities, we can understand the lifetime cost of disadvantage, both lost opportunities and financial cost. This will allow more transparent choices and drive investment in human-centred, strengths-based social support at an earlier stage.

8   Hilary Cottam, *Welfare 5.0: Why we need a social revolution and how to make it happen,* (Institute for Innovation & Public Purpose, September 2020), accessed January 22, 2022, https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp_welfare-state-5.0-report_hilary-cottam_wp-2020-10_final.pdf.

9   Sydney Policy Lab, University of Sydney, *Radical Help for radical times: Five key things we learnt from Hilary Cottam,* (2020), accessed January 22, 2022, https://www.sydney.edu.au/sydney-policy-lab/news-and-analysis/news-commentary/radical-help-for-radical-times--five-key-things-we-learnt-from-h.html.

10   Deloitte, "The path to prosperity: Why the future of work is human", *Building the Lucky Country* (no 7, 2019), accessed January 22, 2022, https://www2.deloitte.com/au/en/pages/building-lucky-country/articles/path-prosperity-future-work.html.

Overcoming the challenge of distance to provide world-class healthcare

Rebecca Tomkinson

Chief Executive Officer, Royal Flying Doctor Service (Western Operations)

WA is a vast, remote and sparsely populated state with an average of one person per per square kilometre. Ensuring that everyone has reliable access to equitable healthcare and emergency, life-saving treatment is a fundamental principle that underpins the Australian healthcare system. This remains an enduring challenge that tenacity and world-leading innovation continue to address.

The life expectancy of people in regional WA is around two years lower than people in Perth. In remote and very remote communities the mortality rate can be around 30% higher than in the city.

Health services are more limited in the regions: the State's six tertiary hospitals are in Perth, within 30 km² of each other. Attracting and retaining a regional medical workforce has always been complex and the relatively high cost of regional service delivery is a disincentive to the market.

> Delivering health services in a way that overcomes the tyranny of distance is essential to meeting our commitment to all Western Australians and to continuing to unlock the economic potential of our regions.

Reverend John Flynn knew this when he set up bush hospitals for pastoralists, miners, road and railway workers, and established the Flying Doctor more than 90 years ago.

This legacy continues, with the operation of a 24/7 service to medically transfer ill or injured patients to definitive care, management of 510 remote medical chests (steel containers with medicines for treating people living and working in extreme isolation), and the delivery of fly-in primary health, vaccination, dental and mental health clinics.

Two proposals

1. Our health system must continue to embrace innovative technologies and service models. COVID-19 rocked the virtual-health landscape, smoothing regulatory barriers and hastening consumer adoption. As part of a comprehensive approach, telehealth can increase service accessibility, reduce the need for long-distance travel, and provide real-time access to emergency and acute-care clinicians.

2. Our mining industry leads the world in the application of remote operations, and we lead the world with the concept of a Flying Doctor – combining these strengths will bolster the mantel of safety for all Western Australians. Joint investment – by the State Government, industry and the community benefit sector – in technology, regional telecommunication infrastructure and regulatory frameworks, will be essential.

Prosperity

WA **has been known for its buoyant economy, thanks largely to its natural resources consistently stocking the workshops of the world.**

It has been something of an economic miracle given the very substantial taxation streams generated at state and national levels. That said, a resources-centred economy attracts its critics and sceptics because of the heavy carbon global footprint of the industries this supports; the local environment impacts in the State itself; and the real obstacles faced by Indigenous groups in protecting their heritage from exploitation.

The mid-century challenge in WA is nothing less than diversifying its economy and building sustainable economies across its own regions. Much of the former is already taking place, although the precise role of the State Government continues to be open to future rethinking and reform.

A particular opportunity lies in re-examining the regulatory and policy environment for new business start-ups where Australia itself lags behind internationally. These are fields in which radical experimentation may have a role, for instance in setting up freeports and zones in which tax and duty holidays are used to lure fresh businesses.

The creation of a new knowledge economy is appealing to many constituencies, but very real challenges lie in ensuring that the State's universities and research clusters can work efficiently with one another and with new industries. There are, in addition, questions and potential opportunities for State Government to develop new partnerships that will dwell in extracting value from research and development.

Some of the pertinent topics in this chapter address questions such as:

- Market and regulatory reform to allow the State's economy to thrive;
- The prospects for data-driven new business opportunities and public services;
- Transitioning to a decarbonised economy.

Part 3

Prosperity

Fostering conditions for a diverse economy to thrive

Chris Rodwell
Chief Executive Officer, Chamber of Commerce and Industry WA

There is a shining future for WA, in which diverse growth lights up our economy. No other economy is so dominated by the fortunes of one sector. Mining comprises a record 48% of our economy; it contributes nine times the GSP growth of sectors like finance and insurance, professional services and healthcare. In WA, business investment outside mining fell in seven of the past eight years, and the rate of research and development expenditure is at historic lows. Between 2007 and 2018, the survival rate of new Australian companies after three years fell from seven-in-ten (69.9%) to just one-in-two (51.8%).[1] To create fertile ground for the diverse growth we need, we must rake aside the barriers to business creation, and foster a culture of entrepreneurial courage and optimism.

Economic diversification is fundamental to the long-term health of our economy. While we can dream up large-scale, publicly-backed initiatives to achieve this, it is critical we recognise the importance of entrepreneurial freedom.

Liberating entrepreneurs to pursue their ideas, through less or better regulation, is the most critical lever at a government's disposal. Indeed, this is the central feature of the world's most innovative economies.

The benefits of start-ups

Start-ups and young companies created nearly half of all new jobs in OECD countries between 1998 and 2014.[2] These businesses exhibit high rates of innovation, readily shifting their operations online or adapting their production. During the COVID-19 pandemic, WA saw health device manufacturers, distilleries and clothing manufacturers diversify to produce personal protective equipment and hand sanitizer.

Thriving businesses, which provide six in every seven jobs in WA, will be the foundation for our future prosperity. Those jobs provide the dignity and security upon which people can build their dreams of career, family and lifestyle.

Embracing a 'regulatory sandbox' approach

A fundamental barrier to agile start-ups is that government regulation doesn't fit or hasn't kept pace with their business model. It's costly and slow to secure the approvals you need to operate. Recall the resistance to the arrival of Uber in Australia. Rideshare services are now part of everyday life. While Uber slogged to pioneer regulation, our economy forewent the benefits.

Instead, a thriving WA of the future would embrace a 'regulatory sandbox' approach – a 'training ground' where new companies can find their feet. 'Quarantined'

1   Based on Australian Bureau of Statistics data.

2   Based on OECD reports.

from regulation for a limited time, it provides a testing environment for proof-of-concept trials, with real users. When applied in the UK and in NSW, this approach helped start-ups fine-tune their business model, get up to speed on regulatory requirements, and increase their credibility with investors and customers.

In WA, we want agri-businesses exploring the applications of drone technology, agricultural chemicals and biotechnology. In the energy sector, we need efficient batteries and better carbon sequestration. Australia has already factored in a 15% contribution towards our 'net zero 2050' transition, to be enabled by technology that does not yet exist. Each opportunity requires a fleet-footed government, ready to create a leading regulatory environment that provides the clarity, consistency and incentive to invest.

Education and training starting in kindergarten

We must also think creatively about education and training, ensuring it keeps pace with global mega-trends, like automation and the digitalisation of manufacturing technology inherent in 'Industry 4.0'. These commitments should begin in kindergarten: robotics, artificial intelligence, machine learning and 3D printing will pervade every business in 2050, requiring hundreds of thousands of workers with entrepreneurial and technical skills to meet the wave of change. There is a global shortage of such people, and they will naturally go where their skills can best enable them to flourish.

Improving the links between research and industry

In the short term, investors aren't looking to press 'go' on WA's home-grown companies and products. We must recognise Perth is not the natural first port of call for start-up investors. We can begin by improving the links between research and industry, and acknowledging and advancing the excellent work being done in life sciences, hydrogen, critical minerals and defence. We should also more fully realise the potential of our strong contingent of high net-worth individuals, who could catalyse 'angel investors', who provide finance to start-ups and entrepreneurs. At the same time, we should push harder to develop the relationships and networks overseas to bring the best talent to our shores, to nourish our start-up ecosystem and attract capital.

Learning from abroad and interstate

India is a global hub of technology skills. Vietnam and other ASEAN countries have achieved great advancements in e-commerce. We should not forget that the United States is a major source of investment, and the greatest source of entrepreneurial culture and skills in the world. WA has never had an appropriate presence there. That should be established in Austin, Texas, where we have pre-existing relationships in oil and gas, and where global tech giants like Tesla, Amazon and Google are flocking.

If we want the template, look no further than our friends in Queensland who launched the 'Smart State' initiative some 20 years ago to end their 'rocks and crops' existence. Today, Brisbane has brushed aside the sceptics, physically and economically transformed, and captured the chance to host the 2032 Olympic Games.

So let there be no doubt that imparted with modern skills, freer and stronger businesses and lower costs, WA can meet any future we imagine for ourselves.

Two proposals

1. Undertake structural tax reform: Australia's tax burden is among the highest in the developed world, according to the OECD. To meet our potential, we will need to tackle big-ticket items, like our high rate of payroll tax and company tax. A restructuring of our tax arrangements is essential if we are to incentivise the right entrepreneurial behaviour.

2. Streamline skilled migration rules: In our vibrant future, WA will also benefit from a steady supply of passionate skilled migrants, under streamlined migration rules. An ideal approach would retain labour market testing but abolish the use of government-designated skills lists.

Opening up WA's options for mine closure

Associate Professor Talitha Santini

Associate Professor of Environmental Sciences and Management, UWA School of Agriculture and Environment; Director of the UWA Mining Innovation Network

WA is a global mining powerhouse, but relatively little thought has been given to the future of mine sites and the surrounding regional populations after mines close. These are often out of sight, and out of mind. Without continuous planning, nearby settlements become ghost towns and mine sites become potentially toxic moonscapes posing danger to human and animal life. As many of WA's 1,000 active mine sites move towards closure over the next two decades, we will be confronted with a growing challenge to avoid creating more examples like Wittenoom, a ghost town legacy to asbestos mining.

Mine closure has been plagued by a lack of creativity and insistence on restoring mined landscapes to their pre-mining condition. In most cases, restoration is impossible (or extremely difficult, time consuming and expensive) and does not deliver the best social, economic and environmental outcomes for communities. We must broaden our horizons and ask, 'What would deliver the most value socially, economically and environmentally?' This opens the door to new possibilities that work with the site's constraints and the desires of the communities that will inherit it. We owe it to future generations to get smart about mine closure. Leaving open pits and shuttered towns scattered across our beautiful natural landscape is a wasteful legacy. By considering more creative options, we can secure regional economies, vibrant communities and their environmental health, and turn WA into a global mine closure powerhouse.

Two proposals

1. Harness opportunities such as pumped storage hydropower, which uses excess solar power to pump water into a mine void at a higher elevation during the day, then discharges through hydropower turbines to feed power back into the grid at night. Mountain bike trails and landscape art installations offer examples of imaginative and valuable post-mining land uses once we stop defaulting to restoration.

2. Engage a range of stakeholders to identify the most valuable outcome for a site. Corporate, government and community stakeholders are typically involved. Greater breadth in community engagement and increased consultation with non-government organisations, entrepreneurs and mine closure specialists is needed to expand the range of options under consideration and ensure the most feasible option is selected. Engagement needs to occur early and throughout the life of a mine, as mine plans and local economies change. This should be tracked and audited by government regulators to support the future prosperity of our regions.

More information

Scan this code to visit the Cooperative Research Centre for Transformations in Mining Economies (CRC TiME) website. The CRC TiME brings together over 70 leading mining and mining service companies, regional development organisations, State and Commonwealth governments and research partners.

crctime.com.au

Developing new markets for green hydrogen

Dr Daniel Schepis
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Professor Sharon Purchase
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As the need to address climate change escalates, governments and the private sector are investing heavily in decarbonising our economy. One potentially emerging solution is to radically increase the use of green hydrogen within the energy mix. Produced via renewable sources and with minimal carbon emissions, green hydrogen is being sold as a panacea to our climate crisis and forecasted international demand is strong. With abundant natural resources, established infrastructure and capabilities, WA is in the box seat to become a world leader in this field. However, this future is far from predetermined.

Despite several large-scale projects now announced for WA, similar investments are being made weekly across the country and abroad, with multiple regions competing to become hydrogen's 'Silicon Valley'. WA's mature energy ecosystem gives us many reasons for optimism; however, we also risk being constrained by our status quo. Ultimately, hydrogen requires more research and funding to become commercially viable and its production is more akin to manufacturing than the resource extraction models currently perfected.

The State's energy providers and government need to open our innovation ecosystem to new players with complementary capabilities in manufacturing or transportation. Hydrogen innovation hubs that focus on capability development and collaboration will transform emerging technologies into future applications. If successful, WA can not only export energy but move up the value chain by using hydrogen as a clean feedstock for manufacturing diverse products. How this ecosystem evolves over the next few decades will determine our global position in currently unimagined hydrogen markets.

Two proposals

1. Develop hydrogen innovation hubs that create open, risk-taking environments for diverse actors such as tech start-ups, researchers and interested private sector organisations to collaborate. While funded by government and industry sources, they should be independently led and not owned by any one company. Hubs should leverage existing capabilities while encouraging cultural change, divergent thinking and new relationships.

2. Government should incentivise new hydrogen applications in emerging manufacturing sectors to diversify the State's economy. Research and development from academia and industry can be financially supported with an emphasis on identifying and de-risking commercialisation pathways.

Linking solar power and food production to decarbonise WA's agriculture

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Fuelled by the Government's net-zero carbon emissions goal by 2050, WA's electricity network is rapidly changing to incorporate renewable energy production. The high land footprint required for renewable power generation raises the risk of power supply competing for land with the agricultural industry. Agrivoltaics (AV), whereby solar power production is incorporated into agricultural land, offers a mechanism to avoid this competition and alleviate the climate-associated challenges to WA's agricultural productivity.

By 2050, increased temperatures, declining rainfall and greater interannual climatic variability will impose significant risks to agriculture in WA.[1] Higher temperatures and increased risks of leaf burn mean that it may not be possible to grow horticultural crops like lettuce close to

Perth by 2030.[2] Livestock, fruit and horticulture, and irrigated agriculture, are at particular risk in WA's hotter and drier future climate. Increasing agricultural production costs and scarcity will increase the number of families experiencing high food stress, defined as spending 25% or more of disposable income on food.[3]

The potential for transformation of the power grid, climate risks to agricultural production, and food stress are not evenly distributed in WA (Figure 1). Instead, areas with high potential for transformation of the energy system coincide with higher food stress indices and areas of known climate risks to agriculture. These coincidences suggest that adopting AV at the fringes of the WA electricity grid could be transformative.

1   R. A. Sudmeyer et al., "Climate change: impacts and adaptation for agriculture in Western Australia", (Perth, WA: Department of Primary Industries and Regional Development, 2016), Bulletin 4870, accessed 27 January 2022, https://researchlibrary.agric.wa.gov.au/bulletins/43/.

2   Peter Deuter, Neil White and David Putland, "Critical temperature thresholds. Case study: Lettuce", (various publishers, 2013), accessed 27 January, 2022, http://www.vegetableclimate.com/wp-content/uploads/2013/11/Critical-temperature-thresholds_Lettuce_V2.pdf.

3   Timothy J. Landrigan et al., "Protocol for the Development of a Food Stress Index to Identify Households Most at Risk of Food Insecurity in Western Australia", International Journal of Environmental Research and Public Health, 16(1) (2018): 79, accessed 27 January, 2022, https://pubmed.ncbi.nlm.nih.gov/30597936.
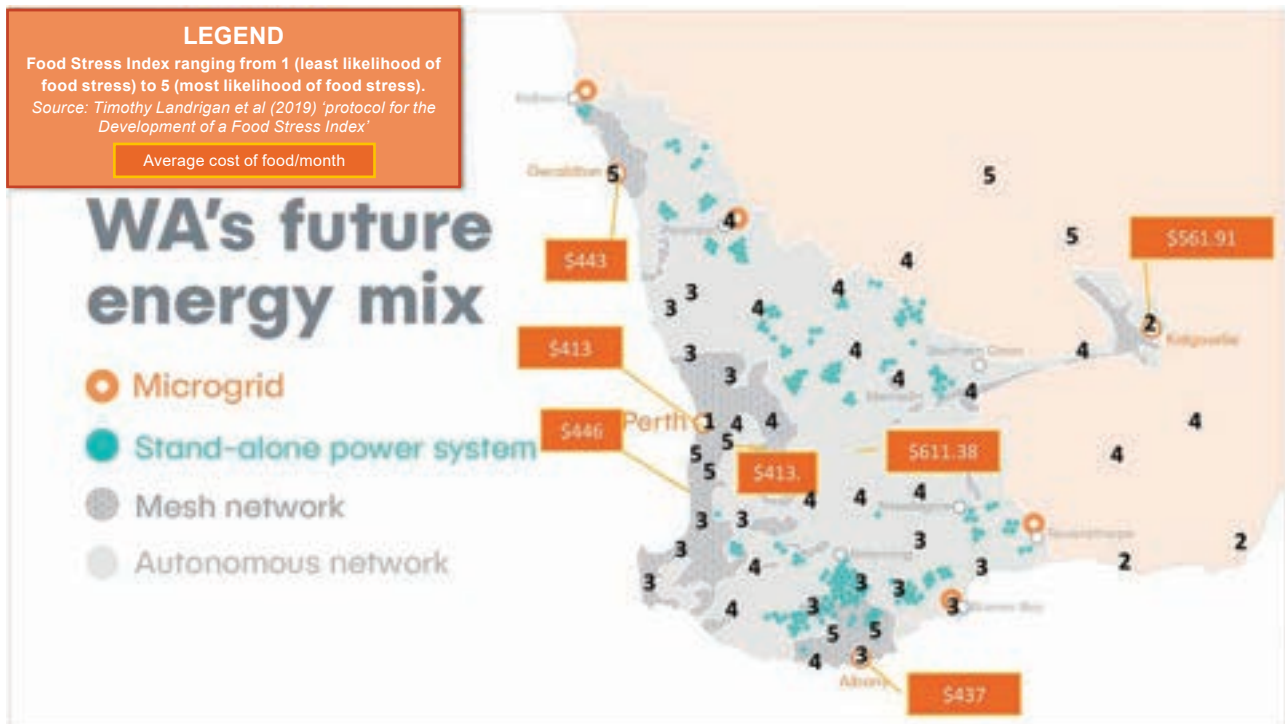
Figure 1: Food stress indices (labelled 1 to 5, where 5 indicates the highest likelihood of food stress) superimposed on a map of predicted future energy mix in South West WA (data from Western Power).

Agrivoltaics (AV) could simultaneously decarbonise WA's energy production, meet the land demands of photovoltaic systems, increase the resilience of high-value agricultural systems to climate change, and reduce unequal experience of food stress in WA.

AV is gaining traction in Europe, the USA and Asia. In WA, we are already experimenting with combinations of solar panels and native revegetation for biodiversity, weed and erosion suppression; and with livestock production for weed control and sheltering stock from weather extremes. Some crops (e.g., lettuce) can be grown beneath solar panel shading with no significant reduction in yield.[4] However, these applications only scratch the surface of AV's potential benefits.

Hot, dry, sunny and windy conditions limit WA's agricultural production. Solar panels provide shade, change wind speeds near ground level, and can reduce frost risk. Strategic manipulation of these changes could reduce leaf temperatures and heat/sun damage; reduce

water losses to evaporation and transpiration; and reduce soil erosion, lodging or leaf damage from blowing sands.

AV offers the prospect of not only sharing land between agriculture and power production, but also of engineering microclimates that enhance agricultural production, resilience and climate-preparedness.

The opportunities are only increasing. For example, organic semi-transparent solar panels that transmit the wavelengths of light needed for plant growth, while harvesting other wavelengths for energy production, are now available. Recent research shows no reduction in lettuce production in plants grown beneath these solar panels.[5] Other high value crops, including fruit trees, regulate flower and fruit production based on day length and light exposure. AV solar tracking algorithms can be designed to optimise solar power generation and crop conditions, adjusting panels to protect crops during weather extremes. Further intensification of agriculture and alleviation of localised food scarcity could be achieved by linking solar power production, water desalination and irrigation, a model currently being piloted for tomato cultivation by Sundrop Farms in South Australia.

4   Harshavardhan Dinesh and Joshua M. Pearce, "The potential of agrivoltaic systems", *Renewable and Sustainable Energy Reviews*, Vol. 54, (2016): 2-16, 299–308, accessed 27 January, 2022, https://doi.org/10.1016/j.rser.2015.10.024.

5   Eshwar Ravishankar, et al., "Balancing crop production and energy harvesting in organic solar-powered greenhouses", *Cell Reports Physical Science*, Vol. 2, 3 (2021), accessed 27 January, 2022, https://doi.org/10.1016/j.xcrp.2021.100381.

To realise this vision, WA must build a fundamental understanding of how design choices for AV systems –including novel designs that optimise farm operations rather than solar power production – determine the below-panel microclimate and power production. Farmers will need guidance on crop selection and management to maximise the benefits of engineered microclimates. A workforce of AV system specialists is required to design systems that jointly optimise power and agricultural yield. The existing solar construction and engineering workforce would need to diversify into the construction and installation of AV-specific systems. Mechanisms will be necessary to link agricultural and power production sectors. Thus, a combined approach involving fundamental science, design of engineering solutions, and cooperative management would help catalyse AV adoption in WA.

Two proposals

1. Joint investment in research by solar companies, agribusiness and the research sector to: determine the microclimatic impacts of AV technology in WA; identify best-prospect crop choices for AV systems; and develop a business case for WA AV technology options. With support from the Department of Primary Industries and Regional Development and Energy Policy WA, produce demonstration sites, case studies, field trials, education and training materials, support commercialisation and start-ups.

2. Design solar energy policies to reward investment in AV partnerships between energy investors, agribusiness and communities. Examples could include grants and tax incentives to reward partnership formation, or adoption of land or food-production offset requirements to discourage 'single use' land uses. This would be implemented at the state level by the Department of Mines, Industry Regulation and Safety and the Department of Primary Industries and Regional Development, or nationally via the Australian Government's Renewable Energy Target.

Preparing WA workers for a decarbonised economy

Professor Yanrui Wu

Professor of Economics, UWA Business School

Decarbonisation will require a dramatic structural shift in WA's economy. Farming, mining and manufacturing are traditionally carbon-intensive sectors and will be most affected. Currently, these sectors provide jobs for more than 230,000 workers, a significant proportion of WA's workforce of 1.4 million. In order to achieve the net zero goal by 2050, many jobs in these sectors will disappear or be replaced by 'green' jobs. These anticipated changes will bring opportunities for WA, but the process may also cause disruption and hardship for many workers and communities.

To minimise the cost associated with these changes, the WA Government should provide support to prepare workers for their transition to a decarbonised economy. The foremost task is to provide an assessment of each sector being affected, potential jobs at risk, and the skills and retraining needs for redeployment of displaced workers. Information about the cost of restructuring in the short term and gains in the medium and longer term should be communicated to affected workers and the broader community. These critical issues are missing in current debates.

> The gradual transition or phasing out of some industries will require workers to be equipped with the skills to work in a decarbonised economy.

On the one hand, the education and training system needs to be more responsive to the business sector in general and skill requirement of workers in a decarbonised economy, in particular. On the other hand, it is also important for employers to invest in the reskilling and retraining of their workforce.

Two proposals

1. The State Government should conduct an economy-wide study of the impact of achieving carbon neutrality by 2050. Its objective should be to identify the number of possible redundant jobs and new 'green' jobs, and hence inform the business sector, policymakers and the broader community with regards to the potential changes ahead.

2. The State Government should support local education and training providers to design a 'response strategy' with updated curricula to reskill redundant workers and train new workers for the green job markets. Relevant policies should also encourage employees to provide on-the-job training for topping up of existing skillsets.

Growing WA's life science economy

Glen Travers

Co-Founder and Chairman, Proxima Concepts Limited, Diabetology Ltd, Axcess Ltd, Vaxcine (UK) Ltd

Healthcare is the second largest expenditure of advanced economies' governments, and it is undergoing exponential technological advances. Life sciences is one of the key growth industries benefitting from these advances. WA has strong medical, hospital, engineering and scientific capabilities that could be co-ordinated and focused to localised product development, manufacture and export. WA can benefit from diversifying its resources boom, as have other farsighted countries such as Norway, and by coordinating education, commercial and government resources like Israel.[1]

Western Australians would benefit from a well-funded, co-ordinated, unified, collaborative strategy and action plan to diversify into internationally relevant and specialised life science opportunities.

This could be populated by attracting the best skilled, scientific and product-oriented experience, made possible due to the high quality of life in WA and the now seamless global communication and collaboration potential.

Western Australians have been impacted by resource cycles. We are already (silently) impacted by Quality-Adjusted Life-Year (QALY) calculations for life science product approvals. There are now $1 million-per-patient therapies, with more on the way, which become unaffordable for both government and private healthcare providers. We should therefore co-develop leading-edge technologies locally in order to balance our trade in life science advances and benefit from local skills.

Two proposals

1. Through co-ordinated efforts by WA universities and the State Government, import the best scientific talent and have a committed and well-funded program to develop breakthrough products for local development, export and revenue-sharing with international partners. This involves identifying areas of comparative technological advantage and pursuing specific technology and product outcomes.

2. Create synergistic, cross-discipline collaborations in order to convert cross-discipline advances into innovative product, as planned in the partnership between Arizona State University's engineering expertise and the Mayo Clinic's medical skills for data-driven patient prioritisation, diagnosis and treatment.[2]

Best practice policies and actions:

a. Establish and fund 'innovation rooms and labs' on campus/hospitals. For example, in a Shanghai medical facility, two PhDs in a small room, lured back

1   Read about Israel's Innovation Plan: https://innovationisrael.org.il/en/

2   Read about the Mayo Medical and Arizona State University partnership: https://mayo.asu.edu/

from Stanford and equipped with the latest mass spectrometer equipment, were able to leapfrog 30 years of US scientific research to find new classes of drugs.[3] More recently, Oxford University established a biological manufacturing facility on campus to allow researchers/small companies rapid access to a good manufacturing practice facility at low cost.[4]

b. Support coordinated human, government and venture capital. In Israel, life science postgraduates and applied tech graduates in disciplines such as AI and engineering are integrated with MBA graduates and internationally linked venture capitalists, in order to design and build advanced technologies from small low-cost but well-co-ordinated teams in medical (and tech) innovation centres allied to hospitals/universities.

Risk capital allocated from international (not just local) knowledge is a key ingredient with government participation/support to thrive.
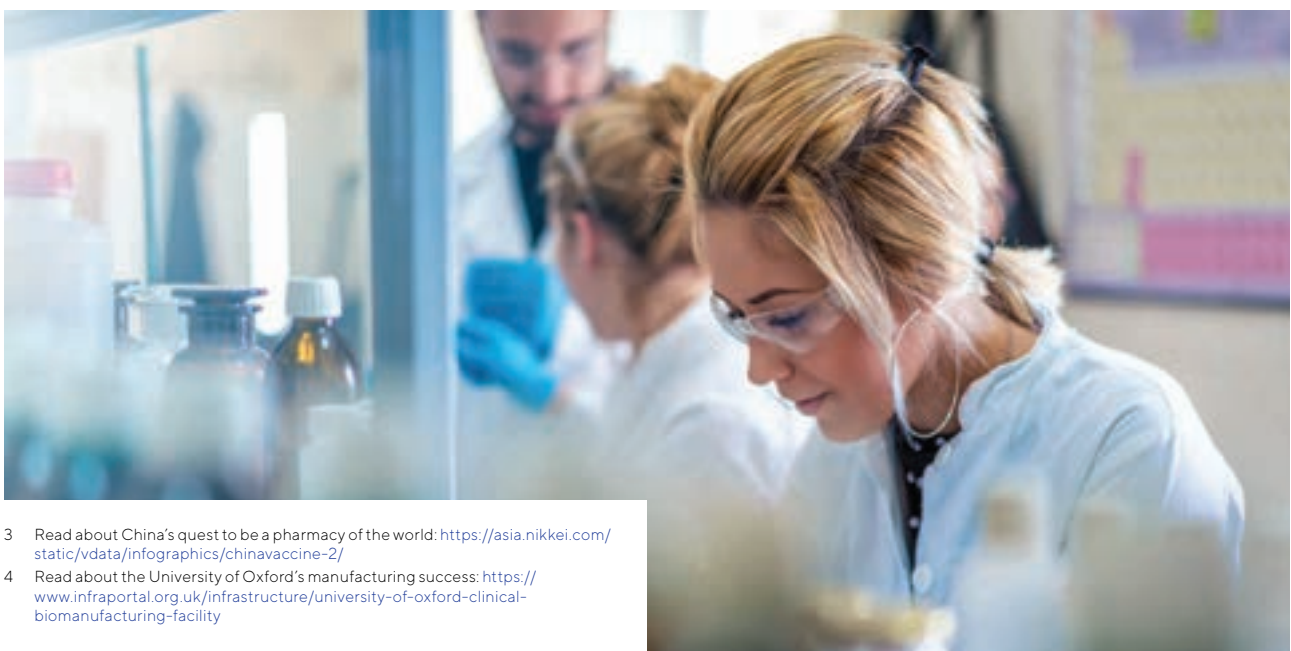
A Response

John Van Der Wielen
Chief Executive Officer, HBF

"Western Australian universities comprise substantial intellectual talent to deliver amazing research and health outcomes. It will, however, require focus on targeted areas such as life sciences to ensure that the State can operate at scale to meet future expectations of health outcomes."

3   Read about China's quest to be a pharmacy of the world: https://asia.nikkei.com/static/vdata/infographics/chinavaccine-2/
4   Read about the University of Oxford's manufacturing success: https://www.infraportal.org.uk/infrastructure/university-of-oxford-clinical-biomanufacturing-facility

Responsible data-driven decisions for modern society

Professor Eun-Jung Holden

Professor in Geodata Science, UWA School of Earth Sciences; Director of the UWA Data Institute

Professor Mark Reynolds

Head of School, UWA School of Physics, Mathematics and Computing

Data has become critical assets for modern society. With the advancement of sensor technologies and digital platforms, we collect and use a vast amount of data to support personal, business and government decisions. As we seek more robust, consistent and fast decisions that are data-driven, the need for innovative digital technologies that are able to transform data to knowledge have become paramount. The core of such innovation is the use of data science encompassing statistical analysis, visual analytics, machine learning and artificial intelligence (AI).

Western Australians, like the rest of the world's population, are adopting (and will increasingly adopt) machine learning and AI both in their daily lives and in their business decisions over the next two decades and beyond. This warrants a wide range of policy considerations such as the ethical collection and use of data, social licensing for the use of automation, and legislative considerations on the responsibility regarding the use and potential failure of digital technologies and automation. What is fundamental to addressing these future challenges is technical experts' responsible use of data science, as well as non-technical decision-makers' and end-users' understanding of the limitations of the technologies being used, including the uncertainties of predictions, and accuracy and reliability of the recommended decisions by the technology.

Two proposals

1. Data scientists must be upskilled on the responsible use of data, data science, privacy and security through tertiary education programs. The Australian accreditation process is increasingly demanding such requirements.

2. Decision makers need to be trained on automation and the associated social and legal responsibilities, including the scale of errors or consequences of mistakes. Executive training courses should be offered by commercial vendors or universities.

The Algorithmic Transparency Standard[1] published by the UK Government and the Ethics Guidelines for Trustworthy AI[2] published by the European Commission provide best practice policies relevant to WA.

A response

Dr Stuart Midgley, Chief Information Officer at DUG Technology

"The increasingly data-driven nature of decision making and knowledge transformation not only highlights the fundamental importance of accessible high-performance computing (HPC) resources, but also thrusts the need for environmentally sustainable computing into the spotlight. To address the growing requirements of WA's society and the associated challenges, reliable, well-supported, green HPC is paramount."

1   Central Digital and Data Office, "Algorithmic Transparency Standard" (UK Government, 2021), accessed January 15, 2022, https://www.gov.uk/government/collections/algorithmic-transparency-standard.

2   European Commission, "Ethics Guidelines for Trustworthy AI", (Publications Office of the European Union, 2019), accessed January 15, 2022, https://data.europa.eu/doi/10.2759/177365.

The gig economy, non-standard work and flexibility

Dr Caleb Goods

Senior Lecturer in Management and Organisations, UWA Business School
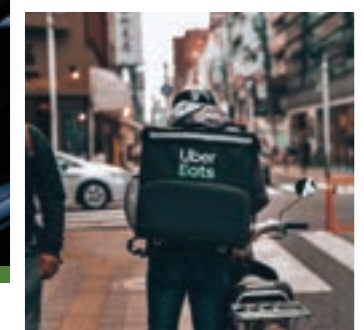
Non-standard or precarious forms of work such as casual employment, fixed-term, labour hire and part-time work has grown significantly. In 2017, these forms of work made up 55.6% of all jobs in Australia. Looking internationally, Australia has a very high level of non-standard work, ranking 3rd in the OECD in 2013.[1]

Recently, we have witnessed the rise of the gig economy, the allocation of one-off 'gigs' organised through platforms such as Uber or Airtasker. 'Gigs' can be as simple as delivering food or as complex as designing a new website. In 2019, 7.1% of Australians were working, or had sought to participate in the 'gig economy'.[2] Uber Eats has approximately 59,000 workers registered in Australia. In comparison, the Western Australian Education Department, WA's biggest employer, has approximately 40,000 staff.

People are attracted to gig work because of its positive attributes such as low barriers to entry and flexible time commitments. However, the growth of gig work also represents a new frontier in precarious work. Gig workers are presently classified as contractors and excluded from Australia's national employment system, meaning they do not receive superannuation, comprehensive occupation

health and safety (OHS) coverage or minimum pay. In 2020, six food delivery riders died in New South Wales in just two months.

Gig work highlights underlying problems concerning how Australia and WA have regulated work and ascribed economic security to standard forms of work that are clearly not standard for more than 50% of the labour market.

Two proposals

1. Beyond completely re-thinking work, WA could improve gig work by amending the *Work Health and Safety Act 2020* to introduce new standards, particularly for high-risk work such as food delivery, requiring platforms to provide safety equipment, training and comprehensive OHS insurance. The Department of Mines, Industry Regulation and Safety should lead this process and the Commission for Occupational Safety and Health has an important role to play too. NSW is in the process of introducing similar reforms in the next 12 months.

2. Nationally, the *Fair Work Act* should be amended to allow gig workers access to the Fair Work Commission to resolve issues such as unfair dismissal and to require the Fair Work Ombudsman to ensure workers are able to earn, at least, the national minimum wage. Expending existing safety nets would better ensure gig work is fair and flexible into the future.

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1   Inga Laß and Mark Wooden, "Trends in the prevalence of non-standard employment in Australia", *Journal of Industrial Relations*, 62(1) (2019): 3–32, accessed January 16, 2022, https://journals.sagepub.com/doi/10.1177/0022185619873929.

2   Paula McDonald et al., "Digital Platform Work in Australia: Preliminary findings from a national survey", (2020), accessed January 16, 2022, https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/6915/6081/7253/Digital_Platform_Work_in_Australia_-_Preliminary_Findings_18_June_2019.pdf, p. 3.

Internationalising WA's tertiary institutions

Dirk Mulder
Principal of MulderPR

International education is important to our State. As an export generator, it attracted AUD$2 billion in 2018/19, it assists in internationalising our campuses and, most importantly, it creates a broader, more diverse alumni who return to corners of the globe as flag-waving ambassadors for WA.

WA's successes to date are largely based on attracting students to Perth, and the WA Government were pioneers in destination marketing. In 1987, the Government set up three Western Australian Education Offices in Singapore, Kuala Lumpur and Hong Kong. Almost in parallel, the Western Australian Education International Marketing Group (WAIMG) was formed. It was this group that would become the independent Perth Education City in 1997 and Study Perth in 2013. This model has been replicated widely across Australia.

International education is changing and while attracting students to WA remains critical, a deeper internationalisation of higher education institutions has commenced.

This process moves from student recruitment to a sense of partnership with overseas universities and agents for mutual benefit. For WA to take advantage of the next two to three decades, it needs to fulfil two critical calls to action.

Two proposals

1. We need to encourage global talent with high levels of research output to consider WA as a new home, including promoting higher research degree participation. This will help raise universities' standings in global rankings; provide focus for finding solutions to WA, Australian and global challenges; and assist with industry and job creation. To assist, the State Government and WA universities should consider:
    a. developing a research impact 'set-up fund' for high impact research to transfer to WA;
    b. increase industry involvement in applied research via funding incentives;
    c. consider increased support for professorial research transferees; and
    d. maintain free education for the dependents of higher degree scholarship holders from abroad at primary and high school levels.

2. If WA is going to succeed in a globalised world over coming decades, we need to promote an understanding of it and engage with it through global citizenship. Our next generation needs to be as comfortable working with a country like Indonesia, as it is working with our eastern states. WA's universities can do this by:

    a. broadening curriculums to build in global competencies, especially language competency;

    b. partnering with institutions abroad and facilitating joint project work in co-delivering curriculum.

A response

"Universities should report on students' capabilities and skills as well as marks. Imagine an academic transcript that explicitly lists the capabilities a student has developed throughout their degree. These could be prepopulated with key skills like language competence, which would contribute to international opportunities and global citizenship for our graduates."

Claire Leong
Teacher (Languages); Director of Professional Practice, Wesley College

Shaping the untapped career potential of WA's underprivileged

Dr Ian Li

Senior Lecturer in Health and Labour Economics, UWA School of Population and Global Health

Evolving technological changes, the changing nature of work and shifts in international politics are some of the major influences on our economy and the wellbeing of our population. It is of critical importance to plan and be prepared to navigate the challenges these changes will present. We need to ensure our population has the knowledge and skills to prime themselves for excellence in the global economy. While WA is fortunate to be endowed with a wealth of natural resources, the core of any strong economy is its people: capacity for social and economic mobility are critical factors that underpin a robust economy and flourishing society. We should aim for social mobility and diversity in decisions and policies at all levels.
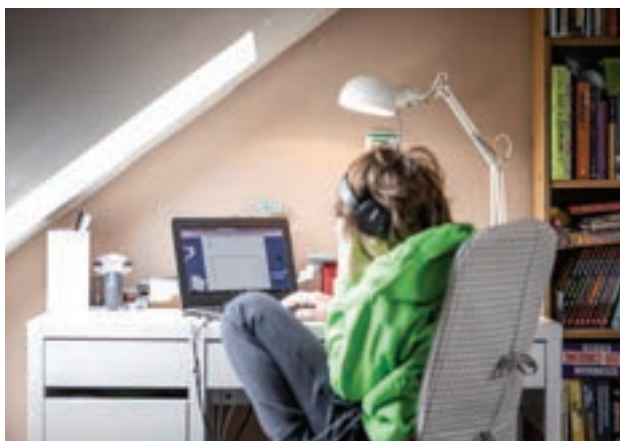
Breaking down barriers to participation and supporting success for under-represented groups in higher education has been a priority in Australia. However, the Department of Education, Skills and Employment's Higher Education Student Data Collection indicates that access rates to university for under-represented groups in WA have declined, for example from 16% in 2017 to 15% in 2019 for individuals from low SES (socioeconomic status) backgrounds. Furthermore, rates of degree dropout have increased, such as for Aboriginal and Torres Straits Islander students whose rates of degree dropout have increased from 23% to 29% over the same period.[1]

One notable gap in facilitating higher education access for the underprivileged is in the provision of careers guidance and advice. Recent research indicates that there is a widening divide in the type of careers information accessed by school students, with students from high SES backgrounds more likely to access multiple forms of careers information, including university entrance information. Students from low SES backgrounds are more likely to receive information on pathways to non-professional vocations. This divergence influences and shapes their future education and work trajectories.

1   Department of Education, Skills and Employment, Higher Education Statistics, "Student Data", accessed on January 15, 2022, https://www.dese.gov.au/higher-education-statistics/student-data.

Two proposals

1. Access to careers advisers and resources is inconsistent across schools and is particularly scarce in government schools. There needs to be a sector-wide approach to resourcing and delivering early careers advice in high schools, with an enhanced focus on underprivileged students. This needs to be led by the Department of Education, as the need is greater in the public sector, while stakeholders such as the Careers Industry Council of Australia also have a role to play in increasing careers guidance capacity.

2. School staff, family members, caregivers and other role models play an important role in the formation of career aspirations in young people. These mentors should be provided with the knowledge and resources – such as information on educational pathways, salaries, job satisfaction and the future of work – to better prepare school leavers to make informed choices.

Further information

Scan this code to read Alfred Michael Dockery, Sherry Bawa, Jane Coffey and Ian W. Li, "Secondary students' access to careers information: the role of socio-economic background", *The Australian Educational Researcher (2021)*.

doi.org/10.1007/s13384-021-00469-1

Scan this code to read D Bennett et al., (Forthcoming), "Ameliorating disadvantage: Creating accessible, effective and equitable careers and study information for low SES students", National Centre for Student Equity in Higher Education.

ncsehe.edu.au/careers-study-information-low-ses-students

Space industry: Opportunities for economic diversification and innovation

Associate Professor Danail Obreschkow

Head, UWA International Space Centre; Associate Professor in Astrophysics, International Centre for Radio Astronomy Research (ICRAR)

The global civil space sector is developing into a trillion-dollar economy, and so Australia sits on the precipice of a space boom. Our unique attributes are supporting both intense industry growth and concentrated funding support from the Federal and State governments.

WA's isolated geographic location, with its radio-quietness and ideal position in the southern hemisphere, makes us a much-needed partner in securing continuous communication links to most space missions.

Many of our existing economic strengths, for instance in remote operations in challenging territory, offer an ideal baseline for the emergence of a strong space economy in WA.

The Australian Space Agency (ASA) is targeting the creation of 30,000 jobs this decade, several thousand of which can be expected in WA. However, as demonstrated by all space-capable nations, creating a prospering space economy requires a space culture, in which emerging industries, academia and government work together.

The role of academia is pivotal in areas of high technical and social complexity such as space. As an internationally recognised university, UWA has the power to:

- lead blue-skies research expanding the edge of human knowledge and fuelling our long-term economic and cultural evolution;
- pursue applied research in areas too risky and/or cost-intensive for private venture;
- offer tertiary education to bring about a capable future workforce in the space sector;
- train and advise industry partners and government;
- inspire the public to unleash widespread excitement and support for space.

This is how UWA can shape our nation's space ambitions rather than follow them.
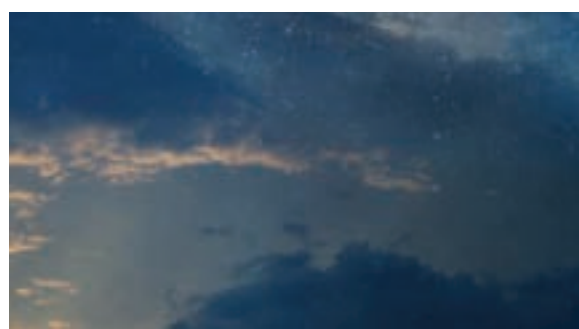
Two proposals

1. Our space economy can be amplified through better coordination between government, academia and industry. This requires a proactive attitude and transparent process from all three players, with leadership from local universities and State Government critical in prioritising high ambitions in space in the first decade of the ASA's existence.

2. We must invest substantially in space education and fundamental research, beyond considerations of direct economic return to leverage the long-term economic benefit of human inspiration and creativity.

Further information

Scan this code to visit the UWA International Space Centre webpage.

internationalspacecentre.org

A response

"The space sector often overlooks the humanities in lieu of the hard sciences. Tertiary students should be engaged with Australia's space ambitions early in their careers so they can become a capable future workforce and enrich our space culture – for example, by introducing post–colonial approaches and insights from historic injustices to Australia's space pursuits."

Ching Wei Sooi
UWA Bachelor of Arts (Honours) student

Looking beyond nuclear-powered submarines: The AUKUS opportunities for WA

Professor Peter J. Dean

Director, UWA Defence and Security Institute; Chair of UWA Defence Studies

I n late 2021, the headlines surrounding Australia's decision to acquire nuclear-powered submarines dominated the news. As the first initiative of the new AUKUS (Australia, United Kingdom and United States) defence agreement, it has generated significant media and political attention both at home and abroad.

AUKUS is significant to WA for a number of key reasons. Firstly, submarines – one of Australia's most significant military capabilities – put the focus squarely on the State as HMAS *Stirling* is home to the Royal Australian Navy's submarine fleet. This sets up the State for a significant role in what is a truly national infrastructure project.

Secondly, this announcement was somewhat bittersweet for WA. For years, the State has been lobbying for full-cycle docking (deep maintenance) of the current Collins class submarines, and all the attendant economic activity and jobs to move from South Australia to WA. AUKUS ended that bid.

But the importance of this agreement to WA goes well beyond just submarines. What has generally been overlooked in the hype of nuclear submarines is the additional announcements on the same day from the Commonwealth about further defence investment for WA.

Even more important is the other, generally overlooked, parts of the AUKUS deal – deep collaboration in key science and technology areas, work on sovereign supply chains and new defence capabilities – all of which are massive opportunities for WA's defence industry and economy more broadly.

Two proposals

1. Over the next 18 months, the Department of Defence will make major decisions on the future direction of the nuclear submarine project. The WA Government should form a task force, with key stakeholders from government, industry and the WA universities, to work with Vice Admiral Jonathan Mead's Nuclear-Powered Submarine Task Force to provide a coordinated and united WA approach to this key national project.

2. As demonstrated in the AUKUS agreement, defence science and technology is moving at a rapid pace and represents a key area of global and regional competition. WA should undertake an audit of key industry, government and university capabilities in the AUKUS areas of focus in science and technology in order to position the State to take advantage of the opportunities that AUKUS will represent.

About the UWA Public Policy Institute

The UWA Public Policy Institute (UWA PPI) is a bridge between academic research and government, public and business needs. Together with our academic Fellows and collaborators across the sectors, we hold public events, private roundtables, publish reports and media pieces, participate in government projects, and provide expert commentary on issues of the day – all with the goal of contributing valuable expertise to policy-makers.

Drawing on UWA's distinct geographical advantage as Australia's Indian Ocean capital city, and by championing an evidence-based approach to policy-making, we also create fresh opportunities for UWA to collaborate with countries across the region.

The team

Professor Shamit Saggar
Director

Shamit Saggar is the Director of the UWA Public Policy Institute and Professor of Public Policy at The University of Western Australia. He is also Visiting Professor at the Policy Institute, King's College, London.

Dr Christopher Lin
Executive Officer

Christopher provides strategic planning, research, and project management for the Institute and helps connect University research with collaborators in government, industry, non-profits and Parliament. He is an ongoing contributor to PEN International and the Centre for Stories, and has facilitated public events on literature, the arts, and diaspora communities from the Asia-Pacific region.

Dr Rebecca Rey
Communications and Engagement Coordinator

Rebecca liaises with University and external stakeholders to promote the Institute's activities. Specialising in research communications, she translates policy expertise for wide audiences and connects researchers to prospective collaborators in government, NGOs, not-for-profits, media and industry.

Anna Zenz (on parental leave)
Executive Officer

Prior to joining UWA PPI, Anna was the executive assistant to the Secretary General of the Global Campus of Human Rights and was involved with the work of the Administrative and Budgetary Committee of the General Assembly of the United Nations in New York. She has worked as a researcher in the field of human rights and international security law.

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