

SESSION 3 CASE STUDY 2

Learnings from Australian Indigenous projects

Ms Madonna Thomson

Aboriginal Biocultural Knowledge Holder and Practitioner

ABSTRACT



Indigenous food projects in Australia offer valuable insights into sustainable food systems. By revitalising traditional Aboriginal food practices and incorporating native plant-based foods, these projects address critical issues such as climate change, obesity, and undernutrition. They highlight the nutritional and health benefits of native foods, such as antidiabetic and antioxidant properties, while also promoting cultural identity and connection to the land. Environmentally, native foods demonstrate stress tolerance and ecosystem benefits. Economically, they provide income sources for remote communities and potential market opportunities. These projects underscore the importance of Indigenous knowledge and self-determination in creating sustainable and resilient food systems. Reference will be made to useful learnings for researchers working in less developed neighbouring countries.

I am here on behalf of the BushTukka & Botanical Indigenous Enterprise Co-operative (BBIEC). I'm a koori person of South East Queensland. This is the first time I have been to Canberra; the first time I have been to Parliament House. I walked in here and I thought about my upbringing and my grandfather's younger brother, the late Senator Neville Bonner. He was the first Aboriginal person elected to parliament. Being here made me think about the conversations that I had with him in my 20s as he tried to prepare me for a life of politics – and I realised I talk far too frankly to do it!

In this talk I give some context for the statements in Box 1; that is, around the role of Aboriginal people with Country, particularly native foods and plants in Australia, which is like the last frontier. It is also extremely important to us because it is through food and plants that we are intimately connected to Country. Our language is all around food, food processing and the utilisation of Australian native plants, from barks to mushrooms to lichens to leaves to seeds to fruits. The extent and the breadth of what we have in this nation is still not fully understood. Nor do we fully understand the role of Indigenous knowledge in terms of uses and applications of Australian native plants and their potential to be solutions to some of the changes that are happening across the world, because Australian native plants are perfectly adaptable to a very dry continent.

Australia is estimated, depending on which Google website you search, to have about 4500 to 6000 species; only 12 of those currently meet the world food standards, according to one or two 2019 websites. In terms of health and the impacts of development across the country, and the removal and impacts on native vegetation in South East Queensland, we have lost an enormous amount of native food species. In some areas of Yarra Country we had more than 35 species just for head colds.

Across the nation, in an Indigenous population of around 3.3% of the nation's population, we are seeing an increase in health-related issues and diseases. A lot of those can be directly attributed to our interactions with Country and the lack of diversity in terms of food, and the impacts from the poor quality food that is being brought into communities. Cattle and other impacts have affected water quality in some areas. There are high impacts on native grains and on animal species that communities rely on for subsistence-living. The poor water

Box 1. Indigenous led & informed research – A Sustainable Benefit Model

Indigenous led & informed research allows for both the appreciation of Indigenous ecological knowledge and application, and its benefits to Indigenous Communities.

Indigenous knowledge about Australian native plants, their use and applications is vital to guiding where research can start and the potential benefits of new 'foods' in the food supply chain.

Research that is conducted in collaboration and consultation with Indigenous communities enables cultural continuity of practice & opportunity for social & financial benefits supporting current and future generations.

quality in some remote communities of Australia directly affects the eyes. In about 2018 or 2019, 65,300 First Nations adults were reported as having diabetes and high sugar levels, on an age-standardised basis. They were 2.8 times more likely to report having diabetes or high sugar levels than non-Indigenous adults.

Three case studies

First, the Wattle Seed project at QAAFI at its Uniquely Australian Foods Research Centre at The University of Queensland. I want to acknowledge Professor Yasmina Sultanbawa, a wonderful human being to work with, who has worked extensively with Indigenous communities not only to develop research outcomes that have informed market demand, but also to create supply chains for Indigenous communities.

Second, the Kakadu Plum research that has come out of the university, and the work of Jessica Cartwright – a PhD researcher and accredited practising dietitian – around a healthy drink using the plum. The work in consultation with a community has identified what they required to help counteract some of the problems around chronic kidney disease.

Finally, the BushTukka & Botanicals Indigenous Enterprises Co-operative: how it has come about as an Indigenous-led solution to enable and support the sovereignty and the development of Indigenous businesses and communities.

Case study 1: Wattle seed

Australia has over 1000 different wattle species, across all states and territories. They are a very resilient and drought hardy legume: a solution for a changing climate perhaps. And they are beneficial for people and for Country. The seeds have been used by First Nations Australians for thousands of years, for uses ranging from weaning children off breast milk, to helping with the gut biome changes of elderly people, and transitioning away from red meats.

Food crop	Energy (kJ/100 g DW)	Protein (g/100 g DW)	Fat (g/100 g DW)	Carbohydrate (g/100g DW)	Dietary fiber (g/100 g DW)	Iron (mg/100g DW)
^a <i>Acacia coriacea</i> (wattle seed flour)	1310	22.5	9.8	13.7	41.4	5.1
<i>Triticum aestivum</i> Wheat-flour whole grain	1448	15.1	2.7	71.0	10.6	3.9
<i>Cicer arietinum</i> L. Chickpeas dry	1581	20.5	6.0	63.0	12.2	4.3

^a Wattle-seed whole-grain flour.

Figure 1. Comparison of wattle seed flour (*Acacia coriacea*) with staple/conventional flours (Sultanbawa and Sivakumar 2022).

We still don't fully understand all the potential benefits from wattles. But we do know that Indigenous knowledge has largely led and informed what is researched, because it would take a lot of money to research over a thousand wattle species. It is Indigenous knowledge that has helped and informed the targets of that research.

That research has included analyses and comparisons to foods in current use (e.g. Table 1 in Figure 1). The information is required not only to create demand but also to find seed that could become a food in Australia, and help create a supply chain.

I think we will find that the reason why we have such a shift in health in Indigenous communities is because of the introduction of a number of different food products, such as wheat, gluten and other things that our bodies are not entirely used to. My grandparents lived a subsistence lifestyle: for instance, they would hunt a possum. My mother's generation did less foraging, and my generation does barely any. That is not just because we cannot go foraging and hunting, but also because disease and other impacts have affected that wildlife, and

because a lot of our plants and animals no longer exist in our areas. They no longer run in my grandfather's country, west of Ipswich in the Lockyer Valley which is a big grain-growing food production centre.

That analysis and study, looking at the nutrient values, helps the whole community in understanding the composition of these foods as it is translated in western science. We know the benefits when we eat that food, and now the research centre has worked with those communities to translate that knowledge into a viable food product.



Figure 2. Wattle seed (right: seed of four wattle species) has a high protein and dietary fibre content, and is a very good source of minerals, particularly Mg, K and Fe. It has excellent flavour for savoury and dairy items and is used for caffeine-free coffee (Sultanbawa and Sivakumar 2022). Above & below: Nutrient-enhanced bread rolls (Adiamo *et al.* 2021; Shelat *et al.* 2019). Below right: Wild harvesting acacia seed.



Wild harvesting is largely the business that Indigenous communities do; not monoculture cropping. It's cultivation on their terms and their Country, and it is sustainable because it is better for their environment. It also allows them to transfer knowledge to the next generation so that we can continue to sustain our practices. In fact, harvesting country is about the continuity of cultural practice. That is how important it is for us, and we can also then transfer the knowledge not only about Country but also the animals, the topography, the geology and the language around how we use that, and the connection that we then have to our past. And the confidence that we gain from doing that is in becoming contributors to our future.

Case study 2: Kakadu Plum health drink

Kakadu Plum tree (*Terminalia ferdinandiana*) is endemic to northern Australia, as shown on the map (Figure 3). It is quite unique. I believe that Kakadu Plum (according to research that's been conducted) has highly contributed to the land management practices of those communities, and to the health of those trees as a result of that land management. The Indigenous community identified and informed the research into this fruit. Otherwise, no one else would have known about it.

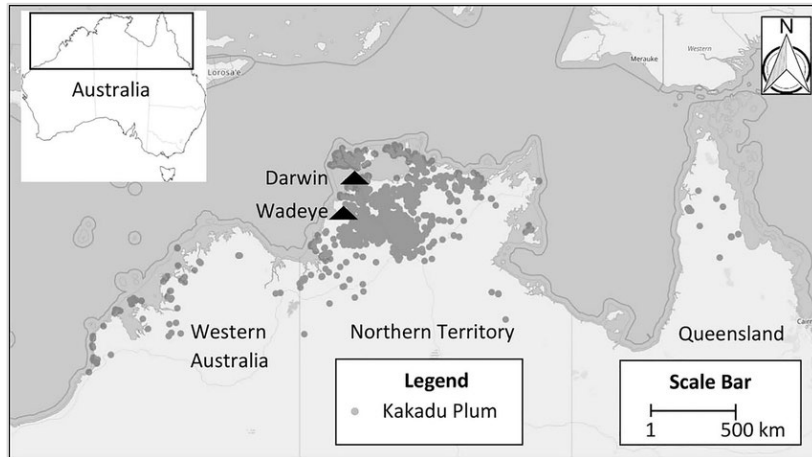


Figure 3. *Map*: Regions where Kakadu Plum grows naturally. *Photo*: The fruit is high in antioxidants, has more than 100x the vitamin C of oranges, and increases the growth of gut bacteria and metabolites that are beneficial for humans. *Map, photo and information* courtesy of QAAFI.

The Indigenous communities have eaten the fruit for thousands and thousands of years and tens and tens of generations, and continue to eat it, benefiting from its nutritional and therapeutic values. They are sharing with the world a fruit that contains the highest amount of vitamin C known at this time, and its applications – not just as a food but also applications across a number of different industries (Figure 4).

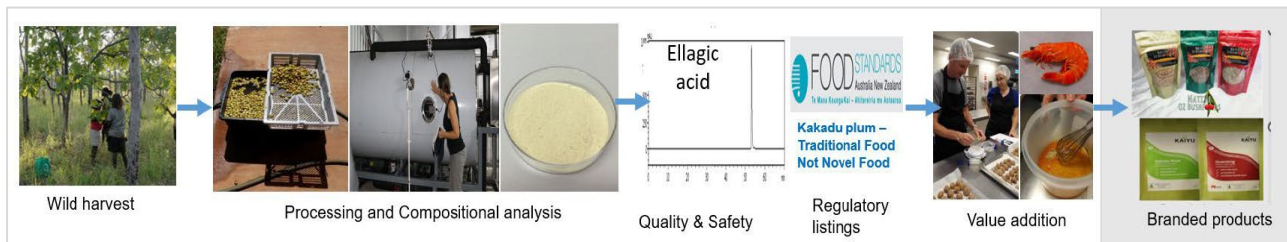


Figure 4. Research impact. Indigenous-led, owned and controlled Kakadu Plum value chain: a model of success that incorporates Indigenous participation in the agribusiness supply chain from wild harvesting to branded products, whilst supplying a range of national and international markets. *Credit: Uniquely Australian Foods Research Centre, QAAFI, UQ.*

We must learn how to ensure that the Indigenous people not only are a part of a valued food chain, but also – where Kakadu Plum has applications across other industries – that Indigenous people are able to reap some of the economic benefit of those applications as well (see Figure 4). Bear in mind that if it wasn't for the Indigenous knowledge, other people wouldn't know about it.

In fact, in Australia, Indigenous people have lost out on some of the biggest industries, such as Macadamia Nut (which in South East Queensland we call Bauple). Also, the Finger Lime, which also originates across South East Queensland and northern New South Wales, and the Lemon Scented Myrtle. None of the larger growers are Indigenous.

Jessica Cartwright at QAAFI worked with the Indigenous community to identify the reason they had chronic kidney disease (CKD), which was also attributed to high potassium and drinking a lot of soft drinks. Indigenous communities identified a need and a solution to that endemic health problem, being five times more likely to develop CKD and four times more likely to die from CKD than non-Indigenous communities.

They wanted a solution for the community. We needed something different, low in sugar with less potassium, that is not going to be harmful to our bodies. We can at least then train the next generation to become weaned off what they have become used to drinking.

In partnership with the community Jessica identified key ingredients. They did a lot of studies on that, and they produced a formula. One of the challenges, however, to the community, is how do you actually produce the end product when you don't have money? And because of the supply of native foods, when we produce an end product like a drink it is five or six times more in cost than a can of Coke. This is where BBIEC comes into play (see Box 2).

Case study 3: BBIEC, an Indigenous-led solution

In BBIEC we look at how to get investment to develop an end product. How do we then create an end product that will be purchasable by other states and territories where there is the disposable income, and then redirect that profit back to the community to enable that drink, that solution, that they came up, with to be accessible for them, if not at no cost, then at a significantly reduced cost?

I chair the Indigenous Enterprises Group that also works with the Uniquely Australian Foods Research Centre at QAAFI, and those Indigenous businesses and communities talked about the need to develop something that was sustainable. It was consistent with the way that we do business culturally. It respects the sovereignty of the family and the clans and their role in their Country and with their ingredients. But how do we address this massive gap around research and ensuring that there is more equitable access to the potential benefits of Indigenous knowledge and the changes that scientific research applies to that knowledge? – because, all of a sudden, we get out of the loop once its application is different.

So we talked about the formation of a cooperative, because that model best fitted us culturally. It allows us to come together like we always have in terms of Indigenous governance, on our issues that matter the most to us. A cooperative respects that cultural form of governance and principally allows the families to do what they need to do as businesses, but come together in a form in which we can identify needs to enable some key gaps and challenges.

One challenge is that there is no funding to enable upscaling and expansion for communities to address the growing demand. \$180,000 is a minimum for a freeze-drying unit, and then there are the skill sets and the

Box 2. BBIEC BushTukka & Botanicals Indigenous Enterprises Cooperative (BBIEC) was formed to:

- Advocate (Indigenous Led Research Projects with Direct Community Benefits)
- Aggregate supply
- Increase visibility and awareness (AusTukka app and Native Foods Ledger)
- Contribute to & lead ethical research
- Educate (training for researchers and institutions)
- Support member growth and expansion (Product development & share models)
- Shared benefits (financially & direct reduced to 'no cost' products)
- cooperative chosen as is consistent with Indigenous principles: with cultural values, allows autonomy & supports small family and clan-based business models.

finances required to be able to assemble that, and people have to be trained in how to use that How do you cost it? It is a whole business model of its own. BBIEC can get access to that. We can have a look at what others are doing and share that information across businesses.

We can come together and look at what does ethical research look like. How do we prepare communities with the templates they need to be able to address the growing demand around research? What are the policies and principles they can have that they can say, 'Here, this is research principles and ethics on our terms'? Also, working with Yasmina the team in those communities identified a number of templates around prior informed consent: Indigenous cultural intellectual property.

What does benefit sharing really look like along the supply chain, so that we're not just marginalising a community again – to just being wild harvesters and growers to supply an ever-demanding market – but they are also not just producing food which is also very expensive? How can they also be shareholders, partners, collaborators in other industries and applications so that they can earn a return of income that will enable them to buy kidney dialysis machines, rather than big government agencies?

BBIEC is designed to not rely on government funding. BBIEC is designed to create income, because in creating income, we have the flexibility to shape our organisational structure so we can develop foundations and provide grants to our members and communities. So, if we are looking at working with a new product that our members and communities are happy with BBIEC taking on, that product, that key ingredient, could grow across a number of communities in Australia.

They don't have to be members of BBIEC. If a successful formula that is designed, co-designed, developed with research institutions and with proper investment, is then sold, we can take a percentage of that and make it available for funding and other grants to any one of those communities that that key native ingredient grows in, without having to be a member of BBIEC.

Conclusion

I have presented three examples: they are Indigenous led; they are Indigenous co-designed. We have a saying here: 'It's not about us, but by us'. We're tired of being researched. We need to be a part of the research and looking at how can we do it so that it is culturally informed and that it meets with engagement and outcomes that fit not only with community demands, but also allows researchers and research institutions to be confident in the programs that they are developing and co-designing with community (see Box 3). And it makes knowledge a social licence.

As someone said before me today, it's about kindness. It also means we are contributing to a better future to ensure that Australia doesn't lose the oldest continuing living culture in the world. We run the risk of having that happen because we are small remote communities of Australia now; we have to ensure our culture is protected because we don't want to be attributed with the tag of having destroyed it.

Box 3. Indigenous-led and informed research in Australian native foods:

- Identifies & develops nutrient rich and healthy foods.
- Enables economic prosperity through research-informed food products.
- Enables Indigenous participation & benefits along the value chain.
- Supports continuation of cultural practices & culturally informed land management & business models.
- Highlights the potential for new food ingredients that may address food security in a world of climate change realities.

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Madonna Thomson is a member of the Jagera People and is a grand-niece of the late Senator Neville Bonner. Madonna has worked with the Aboriginal Communities in South East Queensland with a particular focus on developing and sharing traditional knowledge about management of the State's natural resources and environment. Madonna is Chair of the QAAFI Indigenous Enterprises Group, Chair and co-founder of the BushTukka and Botanical Indigenous Enterprise Co-operative, Director of Nyanda Life Limited, and Director and Owner of Jagera Daran Pty Ltd. Madonna has worked extensively in native title, cultural heritage and natural resource management and has presented at numerous international, national and state conferences on these topics. Madonna is adept at the negotiation of Indigenous Land Use Agreements and Cultural Heritage Management Plans/Agreements. Madonna creates and builds corporate and governance models, facilitates organisational capacity building and advises on accountability and business management.