



Ancient Future
The “Kakadu Plum” Story
Food and Knowledge for
the Twenty First Century

Kakadu plum (*Terminalia ferdinandiana*) which is known as gubinge, madoorr, madoor-roo (Bardi), garbiny (Yawuru), kabinyn (Nyul Nyul), marnybi (Wadeye), nghul nghul, manhmohpan, murunga (East, Central, North East Arnhem) njän'ka-bakarra (North East Arnhem) and colloquially “billy goat plum”, has come, correctly, to be labelled, as a ‘super food’ but it is much more than that.¹ Of all Australian native fruits the chemistry of the kakadu fruit and tree has multi-various therapeutic and bio-active applications for world food, medical, bio-security, beauty, health and manufacturing industries. For the many Northern Aboriginal worlds this borum (bush fruit) symbolizes a strength, vitality and healthfulness of an ancient world that for the first time, the modern world, has come to recognise and seeks in great quantities. For Aboriginal communities everything is part of “family”, every insect and every grain of sand, all have their place and function in a healthy world. The hope generated by understanding kakadu plum and native fruit from an Aboriginal perspective is that contemporary non-Aboriginal communities might also recognise that the Aboriginal ancient philosophy, diet and way of life is important for world sustainability and health. Traditional Aboriginal life, knowledge systems and practical ways of living survive in the 21st century but there is much to do to ensure they thrive, grow and are respected and replicated in modern life. The hope and possibility of the kakadu plum is that there can be a new synthesis of the ancient and the scientific. In this way the kakadu plum heralds an ‘ancient future’ that improves personal health and the health of the world.

To see the kakadu plum in the wild involves tuning the eyes. Aboriginal people travelling along bush tracks in a fast moving motor vehicle can spot fruit ready to be harvested from hundreds of metres away. But for most people the tree and the fruit are invisible, part of the montage of the bush. Botanists describe the kakadu plum as follows: “This tree has a smooth grey bark, large ovate green-grey leaves and fleshy drupes, becoming soft when ripe”. The kakadu plant grows as a small to moderate sized tree between 4 – 10 m high.

¹ See Cock, I. (2012). Kakadu Plum – An Emerging Super-food. *Bushfoods Bulletin*, Winter, 3–4. The term “super food” is subject to an intense debate within the food industry. For example, see on one end of the spectrum of debate Jayson Lusk, 2016, *Unnaturally delicious: how science and technology are serving up super foods to save the world* St. Martin's Press, 246 p. and on the other the best-selling Anthony William, *Life Changing Foods*, Hay House Press, 2016. This paper suggests that Australian native foods tick boxes on each end of the debate. They are nutritionally extraordinary with widespread industrial and pharmaceutical uses validated by food science but are also part of a new consumer-led way of seeing fruit, plants and the environment as inter-connected with the health of all life forms. This is very much an Australian Aboriginal concept in which even mosquitoes and midges are part of “family”.

The tree has a rough, creamy grey bark which is flaky and finely tessellated. The leaves are spirally arranged and dense towards the ends of the branchlets. The fruit is yellow to green and beaked, containing a single seed.²

The term “kakadu plum” is a misnomer in one sense. Most of the official botanical records of the plant occur around the Mirrar homelands and the world heritage listed Kakadu National Park, however the tree grows prolifically across the North of Australia above the Tropic of Capricorn. There is some evidence that the tree will grow as far south as Carnarvon on the west coast and Brisbane on the east coast of Australia.³ For Aboriginal people living in regional towns, kakadu plum is, along with mango trees, a tree to be planted close to the house and closely watched and harvested at the right times of the year.

What Kakadu Plum means for Aboriginal communities: Harvest, Social and Cultural Significance, Ceremony

Though it is named “kakadu” plum, after the Mirrar people’s home country in which it has been most recorded by botanists, Kakadu plum is a traditional food of all of the Northern Aboriginal peoples of Australia who live above the Tropic of Capricornia. Kakadu plum has many traditional names and these are an important means of identifying the origins of each crop and they are also very special and unique to each Aboriginal community. The drupes (stone fruits) can be seen resplendently forming and ripening on the trees from September to June. The tree often produces a first crop of fruit in December and a second crop of fruit in May/June in many parts of North Western Australia, the Northern Territory and North Queensland.

As each day goes by scientists seem to make some extra-ordinary ‘discovery’ about the properties of Kakadu plum, but important as the scientific work is, the traditional peoples of Australia have always known about the life-giving properties of this bush food and even more significantly its role in our health and the health of the land. It was used as a source of

² *Indigenous Kimberley Trees in Broome*, Compiled and Edited by Tom Harley and Elizabeth Lovegrove for Kimberley Environmental Horticulture, 2012, p. 43

³ Personal Communication, Broome, 2018

vitality and energy on long walks.⁴ It was known as a headache cure. It was used as an anti-septic. It was used as an anti-inflammatory agent for swollen joints or bones⁵. It was used as a food additive⁶. A preparation from the inner bark was used to treat sores, boils, backache, ringworm, leprosy sores, wounds, scrapes, ulcers, scabies, bites.⁷ It was known to be a food preservative⁸.

Most importantly the gathering of the food was part of an ancient practice involving the stewardship and agricultural development of lands which have not been well understood by European based farming experts or modern industrialised agricultural and horticultural experts. Often it is assumed that Australian native vegetation should be bulldozed and transformed into gardens and plantations, when in fact the bush itself is a pharmacopia, garden and farm in its own right. The relevance of this realization for mining re-vegetation projects in Northern Australia and new forms of income and sustainability for Aboriginal peoples is profound.

Terminalia Ferdinandiana is unique within the Aboriginal world itself. In North East Arnhem land, where the language and culture of the Yolngu people remains strong, almost every known plant, tree, shrub and bush fruit belongs to one of two moieties and as such has a place within the ceremonial cycles of life, death, traditional law and the celebration of the creative beings who made the world. The cycad *arnhemica*, and its nuts, *malaŋanba*, for example, belongs to the *yirritja* moiety and has a very important role in ceremony. The sacred identity of plants and their representation *maḡayin/miny'tji* is carefully protected and managed. Representation and painting itself is undergoing a steady evolution, where once painting was reserved for men and for ceremonial body paint, now painting is open to women and designs are becoming modified for public display. The painter *Mulkuŋ Wirrpanda* talks of trying to find ways to represent plants and fruit in ways that show their secular and not sacred meaning⁹. When a plant or fruit is so powerfully represented through sacred

⁴ See Batumbil Burarrwanga, "Don't Forget Your Dilly Bag", op cit.

⁵ *ibid*

⁶ *ibid*

⁷ *Ibid* and see T.K. Lim, "Terminalia Fedinandiana" in *Edible Medicinal and Non-Medicinal Plants: Volume 2, Fruits*, p. 158-160

⁸ *Ibid*.

⁹ *Midawarr/Harvest: The Art of Mulkuŋ Wirrpanda and John Wolseley*, 2017, p. 18

designs in ceremony, there are sometimes related songlines and ceremonies across the Aboriginal lands and communities of the North.

Traversing sacred representation is not an issue for *terminalia ferdiniana* within the Yolngu world at least. The unique aspect of *terminalia ferdiniana* or murunga (East, Central, North East Arnhem) ṅāṅ'ka-bakarra (North East Arnhem) is that uniquely it seems to exist outside the famed [gurrutu](#) (kinship) system which links all lands and peoples. It does not belong to a moiety but has a dimension of being something like a public good that belongs to all. There is an interesting long-term research project on this phenomena in itself. What does it mean? Are there other entities that have a similar status? Is it because the memory of its ceremonial status has passed? Work needs to be done with elders across the north to compare traditional knowledge about the fruit and its role in life.

What is confirmed from Broome to Yirrkala and across Cape York Peninsula is that *terminalia ferdiniana* was known to be a source of health, strength and life and had the status of a seasonal food that brought vitality and was a fruit that rewarded the active stewardship of lands and hunters who diligently sought food for their families. Certainly kakadu plum is associated with the endurance, physicality and good health that came with the traditional Aboriginal way of life.

As a 'public', 'secular' fruit *terminalia ferdiniana* is of enormous significance because the recognition of its qualities potentially opens up the bush and the lost arts of Indigenous peoples for a strong contemporary cultural and economic value. It is potentially the most important practical symbol of an important reconciliation between traditional and modern life and the revitalization of Aboriginal communities. Will Stubbs has recently noted: "Whenever a person is lost in the bush for even a couple of hours we get a national news update until they are recovered. If they survive a few days and emerge alive, it is enough to make them a national hero on TV and the object of awe and celebration. How does this sit with the lack of regard for the Indigenous history of prosperous survival here? Can anyone truly claim to own land that they cannot live on without external help?" Stubbs goes on to

describe the fragility of Indigenous knowledge even among the strongest Aboriginal communities.. “..Despite a strong ceremonial culture and one of the most active contemporary resistances, the Yolŋu people of north-east Arnhem land are not immune to the decay. .. There are many plants that were known to elders even a generation ago that are not known to a significant proportion of young Yolŋu people and many plants ‘may never have been gathered even by middle aged Yolŋu people. As Stubbs suggests “The loss of this ancient monument is more than simply esoteric angst at the destruction of the legacy of history; it is the loss of the key to our contemporary and future survival on the continent”.¹⁰

Because of its nutritional and economic value, *terminalia ferdiniana* can help contemporary Aboriginal communities earn a livelihood as well as revitalizing hunting and gathering traditions. In this respect *terminalia ferdiniana* is not just another commodity to be consumed it leads us to new understanding of the bush and life itself.

Aboriginal communities have always cultivated bush orchards where the fruit is with no conventional farming techniques necessary to maintain the health of the plant and the fruit. All parts of the plant are used for many different purposes and the annual season of kakadu plum was part of a larger dimension of a healthy life. The concept of healthy, seasonal produce consumed within a life of land stewardship is an important dimension of understanding the true qualities of bush foods and their production and harvesting. IF the fruit is simply understood as a substance with beneficial properties that can be mined, then its true healthy qualities will be lost by mainstream society. Kakadu Plum is part of a greater biological and human ecology that is the provenance of the Aboriginal peoples of Northern Australia. It is perhaps ironical today that when conventional mainstream monetary income fails, as it frequently does in remote Australia, kakadu plum is the kind of survival food that Aboriginal people turn to for sustenance¹¹.

10 Ibid., pp. 12-13

11 The Aboriginal story of kakadu plum has a resonance with many health and nutritional narratives. The Jurlique skin/beauty cosmetic range notes that “The Kakadu Plum must be harvested from the wild in some of the most inaccessible areas of north-western Australia. Because of this, the fruits tend to be handpicked by Aboriginal Australians who care for the land, and draw on generations of traditional knowledge when it comes to finding and utilising this unique

The Modern Recognition of “Kakadu Plum”

Kakadu Plum first gained world-wide scientific recognition in 1982¹² as a fruit with the highest recorded levels of natural Vitamin C, measuring up to 50 times the Vitamin C content in oranges¹³. Following this finding, it was quickly confirmed that the fruit has 5.19 times the antioxidant levels of blueberries. It contains a strong fat-soluble antioxidant, Vitamin E. It is a rich source of lutein, “the eye vitamin”, known to prevent eye diseases including age-related macular degeneration (AMD), cataracts, and retinitis pigmentosa. Lutein is also coming to be regarded as preventive for colon cancer, breast cancer, type 2 diabetes, and heart disease. Kakadu Plum has a high potassium:sodium (K:Na) ratio which may assist to develop foods to reduce hypertension. Kakadu Plum exhibited six times the oxygen radical absorbance capacity, that of a blueberry, which may provide protection from oxidative stress.¹⁴ After the discovery of the kakadu plum’s extraordinary anti-oxidant and vitamin C composition, there has been world-wide interest in the molecular characteristics of the fruit. Clusters of promising research findings indicate that kakadu plum products and uses will only grow in number and the demand for the fruit can only rise:

- **Germoplasm/Genomic Patenting and Genetic Engineering:** From 1982-2011 there were successive international attempts to patent the genomic and molecular structure of kakadu plum particularly for beauty and nutraceutical products. These were challenged by Australian Aboriginal communities and this remains a contested domain of intellectual property and native title rights. Nevertheless the genomic characteristics of kakadu plum remain a domain of high research interest. This is an area of interest in relation to royalty payments but also moral and ethical use of the genetic qualities of the kakadu plum.
- **High Nutritional Value:** Following the revelations of Brand et al¹⁵ there have been

fruit. ..Today, we draw on all the powers of this Australian superfruit in our Purely White range, so we can deliver the most efficacious skin-brightening results.
<http://www.jurlique.com.au/blog/2015/02/27/meet-the-kakadu-plum-australias-unique-skin-care-superfruit/>

12 Brand JC, Cherikoff V, Lee A, Truswell AS (1982) An outstanding food source of vitamin C. *Lancet* 2:873

13 Perzada et.al, 1990

14 Konczak, I., Zabarar, D., Dunstan, M., Aguas, P., Roulfe, R., Pavan, A., (2009) *Health Benefits of Australian Native Foods*, RIRDC Pub. No. 09/133. Research: McDonald, J. K., Caffin, N. A., Sommano, S., Cicksedge, R., (2006) *the effect of post harvest handling on selected native food plants*, RIRDC Pub. No 06/021. Konczak, I., Zabarar, D., Dunstan, M., Aguas, P., Roulfe, R., Pavan, A., (2009) *Health Benefits of Australian Native Foods*, RIRDC Pub. No. 09/133.

15 Ibid, Brand et al, 1982

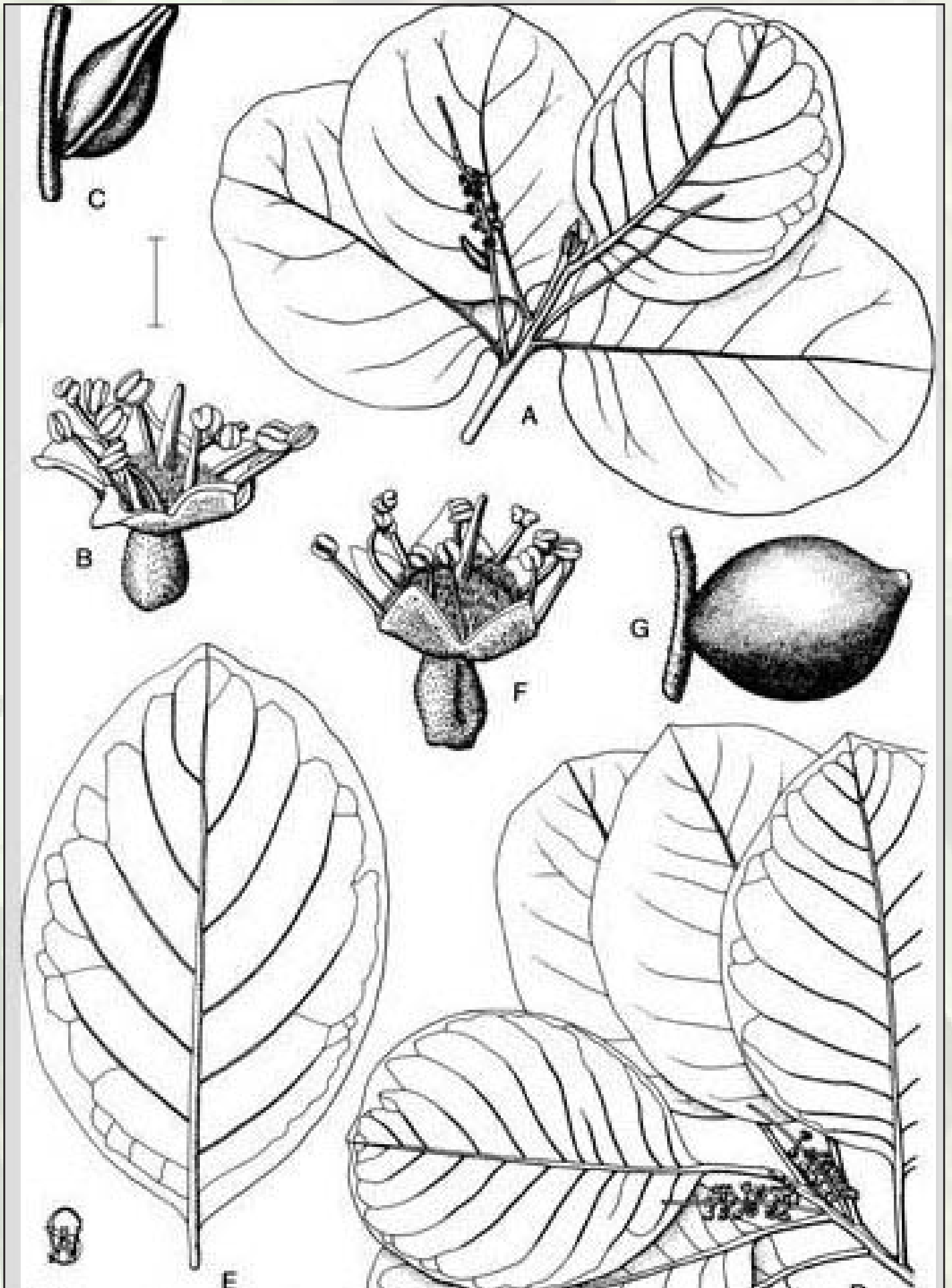
many studies of the high vitamin c and anti-oxidant levels of kakadu plum. Because of its high concentration levels of vitamin c, kakadu plum can boost the nutritional value of cereals, drinks and general foods without adding significant weight or volume making it an ideal food additive. This also makes kakadu plum a highly desirable natural ingredient of nutraceutical products in the beauty and skin care industry.

- Anti-bacterial and anti-inflammatory qualities: Cock and Moriarty in 2011¹⁶ investigated Kakadu plum as a natural anti-bacterial and anti-inflammatory substance in relation to auto-immune diseases such as rheumatoid arthritis, Systemic lupus erythematosus (lupus), Inflammatory bowel disease (IBD), Multiple sclerosis (MS), diabetes mellitus, Guillain-Barre syndrome, Chronic inflammatory demyelinating polyneuropathy, Psoriasis, Graves' disease, Hashimoto's thyroiditis, Myasthenia gravis, Vasculitis.¹⁷ Even without clinical trials there may be advantages for patients of these diseases to take kakadu plum as a food additive as the Vitamin C and anti-oxidant properties of the fruit are also a benefit to general well being. This makes kakadu plum an automatically attractive food for health food stores and alternative medicine. In 2015 Sirdaata et al found that kakadu plum extract inhibited the growth of the bacterial triggers of rheumatoid arthritis.¹⁸
- Gastro-intestinal health: Monty and Cock proved in 2012 that Kakadu plum is a natural inhibitor of gastro-intestinal diseases. Giardia is one of the most common infections worldwide of water and food borne diseases. Giardiasis is a debilitating disease that can cause long term illnesses in children and is caused by gastrointestinal parasites of the genus Giardia. Kakadu plum is not only a treatment it is also a preventive agent giving it a potential world market in parts of the world where these infections are common.

¹⁶ Cock, I. E. and S. Mohanty (2011). "Evaluation of the antibacterial activity and toxicity of Terminalia ferdinandia fruit extracts." *Pharmacognosy Journal* 3(20): 72-79.

¹⁷ Courtney, R., J. Sirdaata, et al. (2015). "Tannin components and inhibitory activity of Kakadu plum leaf extracts against microbial triggers of autoimmune inflammatory diseases." *Pharmacognosy Journal* 7(1): 18-31.

¹⁸ Sirdaata, J., B. Matthews, et al. (2015). "Kakadu plum fruit extracts inhibit growth of the bacterial triggers of rheumatoid arthritis: Identification of stilbene and tannin components." *Journal of Functional Foods* 17: 610-620.



Terminalia Ferdinandiana, As drawn by W.A Smith
Queensland Herbarium

- Medical products: In 2016 Wright et al have demonstrated that kakadu plum has an inhibitive effect on necrotic skin disease¹⁹. Because of this and other qualities kakadu plum has strong potential as a medicinal cream and oral medicine.
- Food preservation: In 2012/13 research and trials began using kakadu plum as a natural food preservative. The shelf life of prawns increased from 2-4 days to up to 14 days. In 2014/15 \$22.5 million worth of prawns were treated with a Kakadu Plum extract formulation. In 2016 15 per cent of Queensland's prawn farming industry is using Kakadu Plum extract as a food preservative. The only other natural product that has qualities of food preservation is the Australian rainforest plum [*Davidsonia jerseyana*](#) or Davidson Plum but its food preservation capacity may be less than the kakadu plum and it less plentiful than kakadu plum.
- Eye health: Kakadu Plum is a rich source of lutein, "the eye vitamin", known to prevent eye diseases including age-related macular degeneration (AMD), cataracts, and retinitis pigmentosa. The fact that there has not been a significant amount of scientific research around this dimension of the kakadu plum maybe because private pharmaceutical companies cannot easily patent the compound or can obtain it from other sources. However this is certainly an area where public health clinics in Northern Australia where eye diseases are prevalent could develop their own natural ointments and treatments. Fred Hollows Foundation is a leader in this field.
- Australian cuisine, food and health: Several Indigenous caterers and chefs have made kakadu plum a hero native fruit i. Collaborations with food scientists have centred around retaining the bioactive properties of kakadu plum in processing, packaging and storing foods.²⁰ Chefs such as Maggie Beer and Clayton Donovan have featured kakadu plum in ways that could make it a favorite ingredient in everything from deserts to bbqs.²¹ Maggie Beer has also featured gubinge/kakadu plum

¹⁹ Wright, M. H., J. Sirdaarta, et al. (2016). "Growth inhibitory activity of kakadu Plum extracts against the opportunistic pathogen *Clostridium perfringens*: New leads in the prevention and treatment of clostridial myonecrosis." *Pharmacognosy Journal* 8(2): 144-153.

²⁰ <https://www.business.gov.au/assistance/entrepreneurs-programme/innovation-connections/customer-stories/customer-story-karen-sheldon-catering>

²¹ See <https://www.maggibeerfoundation.org.au/blog/gubinge-bark>

as a health food and alzheimers disease preventive compound.²²

- Cancer treatment: Apoptosis is an important mechanism in the treatment of cancer and diseases such as AIDS. Kakadu plum has been shown to activate an apoptosis function in cancerous cells. This causes cancerous and diseased cells to die and creates a healthier environment for healthy cells to multiply.²³

Arising from these discoveries there are a host of potential industrial, health, medicinal and pharmaceutical uses of kakadu plum from being used as a natural anti-bacterial cleansing agent in hospitals to creating alternative anti-bacterial tooth paste to being used as a cosmetic and skin care product to food preservation and as the basis for anti-cancer drugs and auto-immune diseases treatment. If Australia is to capture the value of these potential products there must be a focused effort to invest in, develop and create the value chain of production from Aboriginal growers, plantations and bush orchards to modern science based innovations and products. Australia's overall investment in innovation is arguably too small and unless this changes the prospects of the value adding parts of the kakadu plum industry remaining in Australia are questionable. A kakadu plum industry body that can promote research and development as well as value added products is much needed.

Native Fruit Industry Development, Profitability and the Sustainability of Aboriginal economies

Strategically the development of a kakadu plum industry is of great importance for all Aboriginal Australians. More than 15 per cent of the Australian continent is under the control of Aboriginal people and organisations. Much of this land, from a Western agricultural perspective, is bush, range lands, marginal, over-grazed or degraded and would require significant financial investment to create traditional rural productive farms or enterprises. This is often beyond the capacity of Aboriginal family and title holders and also beyond the government and other organisations who are charged with assisting Aboriginal people to

22 <https://www.sbs.com.au/food/article/2017/11/03/maggie-beer-wants-you-eat-your-way-better-brain-health>

23 Tan, A. C., I. Konczak, et al. (2011). "Potential antioxidant, antiinflammatory, and proapoptotic anticancer activities of Kakadu plum and Illawarra plum polyphenolic fractions." *Nutrition and Cancer* 63(7): 1074-1084.

manage their lands. Frequently conventional agriculture is just not a good or feasible strategic consideration. Harvesting seasonal high value native fruits in this context is a game changer which has lessons for the Australian rural economy as a whole.

Contemporary science indicates that kakadu plum will be the basis of a profitable primary industry and a series of innovative products in the future. However, will the development of the Kakadu Plum and native fruit industry be based in Australia? and will it support the future sustainability of Aboriginal land enterprises and community economies? Much of the future potential for Australia depends on the support of Commonwealth, State and territory governments, Australia's private investment community and the nimbleness of existing Aboriginal public authorities, community enterprises and their ability to cooperate and support Aboriginal entrepreneurs and families. The future is promising if what Keynes calls the economic 'animal spirits' around kakadu plum development can be harnessed. The fact that kakadu plum trees grow in abundance across the north of Australia and no-where else in the world is a major advantage. The road map and check list of what must happen now varies depending on interest groups, however, one fundamental precept is that Aboriginal knowledge and land combined with mainstream expertise, capital and know-how is essential for a more profitable kakadu plum industry in Australia or elsewhere.²⁴ There is no question that Aboriginal people and knowledge must be at the centre of all future developments.

An Industry in its Infancy

The Kakadu Plum industry is in its infancy as a domestic and export industry. As has been noted by several business analysts: 'only a small number of commercial harvests have ever been undertaken, and only a handful of farms had attempted to respond to the ever-expanding global market for Kakadu Plums'.²⁵ The most successful Australian native fruit export is the macadamia nut and in 2017 46,000 metric tonnes of shelled nuts were produced and up to 70 per cent of the product was exported. This dwarfs the size of the kakadu

24 Emerging Business Models for the Kakadu Plum Industry, PWC, 2017, p xi

25 Ibid., p. xi

plum industry in which 5 metric tonnes were produced in 2018 and all was consumed within the domestic market.

Nevertheless the pioneering work of T.H.E. Kakadu Plum Working Group, Palngun Wurnan-gat Aboriginal Corp, Gundjehmi Aboriginal Corp, Mamabulanjin Aboriginal Corp, the Indigenous Land Corporation and their supporters and advisors including the Queensland Alliance for Agriculture and Food Innovation and the Kimberley Institute Inc. as well as several Aboriginal based entrepreneurs at Bidydanga, the Dampier Peninsula, Yirrkala and Cape York Peninsula have been seminal and show the potential of the industry to grow very strongly.

To be successful and prosperous the Australian kakadu plum industry must harness a diverse range of stakeholders from private investors to Aboriginal traditional owners to homelands communities to rangers groups to agriculturalists and farmers, scientists and food processors. Cooperation and good will is needed between Aboriginal communities and non-Aboriginal partners, between government and private investors, between Aboriginal communities across the North, between large and small enterprises and between Australian and international partners.

The Role of Government: A Native fruits/Kakadu Plum Marketing Authority vs Stakeholder and Information Associations

Legislation to protect, develop and enable the kakadu plum industry must be enacted in the Commonwealth, WA, NT and Qld parliaments. This coordinated legislative effort should create a central marketing authority that develops and coordinate the efforts of kakadu plum growers in the States and Territories and obtain the best international and domestic prices for the fruit. It should also work with centres of research and development in Australian research institutions particularly in the food and biotechnology centres of Brisbane and Melbourne.

Federal, State and Territory government have played seminal developmental roles as buyers/sellers, direct investors, marketers, price regulators, global exporters, infrastructure providers, research and development agencies, forecasters and planners for every major

Australian primary industry. Over the course of the 20th century many billions of dollars were invested by government in primary industry so that in turn in 2018 the combined grains, sugar, meat and other farm products industries contributes 3 per cent of Australia's GDP and fifty billion or 13 per cent of Australia's total export returns. Moreover Australia is almost fully self sufficient (93 per cent) in food and agriculture and one Australian farmer feeds on average 600 people worldwide each year, collectively the equivalent of 80 million people or three times the Australian population.

To be successful the kakadu plum and native fruits industry requires significant public support and investment. One of the institutional challenges for government and an important change in the national narrative is for Aboriginal lands, enterprises and knowledge to be seen to be as economically and strategically important as farming communities have been viewed in the past. The kakadu plum may be the modern product that finally allows Aboriginal people and organisations to be seen as fully fledged commercial partners and primary producers. This is to reinstate a little-known dimension of the Aboriginal people of Northern Australia as Australia's oldest exporters. Trepang which grows in the sea waters, close to the bush orchards of kakadu plum in North East Arnhem land was successfully traded with Macassan and then Chinese traders for up to 400 years before modern colonisation.

It is instructive to note that all Australian primary production is still heavily supported by publicly owned or supported marketing authorities. Historically statutory authorities had a monopoly and very tight control over the purchasing and exporting of all primary products including meat, wheat, wool, sugar, cotton. Although there has been a trend towards de-regulation in recent years, due to some profound mistakes by the management of the Wheat and Wool Boards, in the early development of primary industries marketing bodies are essential. This is because long term patient capital investment is needed alongside international and domestic marketing that is beyond the capacity of individual producers and even significant investors. Many marketing authorities continue to play a very, hands on and important role in the development of primary industries. The rice marketing board

formed in 1928 owns all Australian export rice. The rice becomes the property of the board and the board's function is to obtain the best possible return for growers. Domestic rice production and sales are also highly regulated by the board. The rice marketing board also financed the development of all of the processing and storage facilities that enabled the industry to grow strongly and obtain good returns over many decades.

Stakeholder and information associations, such as Australian Native Foods and Botanicals Limited (ANFAB) in its current form, are not enough to truly develop a primary industry. It is important to note here that the macadamia industry was not supported by a public marketing authority and although it is a native Australian fruit, now only 3.2 per cent of world kernel production currently takes place in Australia. South Africa, South America and China are increasing production to much higher levels than Australia. World supply effects the price of the Australian product and Australian macadamia producers are very vulnerable to over supply that can occur due to seasonal variations. Hopefully this will not occur for the kakadu plum industry at least, for the present, the majority of world supply can only come from northern Australia.

There is as all this suggests and urgent need to create a statutory kakadu plum/native fruit marketing authority or corporation whose first priority should be the development of the kakadu plum industry. In the first instance the marketing authority should purchase all kakadu plum tonnage for export and regulate the sales of domestic kakadu plum production with the goal of obtaining the best returns for individual producers. The native fruit marketing authority should also with the aid of the machinery of government, under-write and finance the creation of processing plants and storage facilities in five key centres of kakadu plum production, Broome, Wadeye, Darwin, Yirkalla and Weipa.

Realistic and evidence-based industry projections of the future revenue of the kakadu plum industry predict a 30 tonne annual crop yielding between 3 and 5 million dollars per annum within five years.²⁶ This is a modest estimate. But the most important factor in the devel-

²⁶ Ibid.

opment of the industry is centralized marketing and coordinated investment. With these elements in place the industry could potentially grow faster and have a strong international market place. A hybrid public and private investment strategy focusing on five main centres Broome, Wadeye, Darwin, Yirrkala and Weipa would be most desirable in the first instance. The Brisbane based bio-food centre of excellence focused around St Lucia and the University of Queensland is also critically important to the development of the industry.²⁷ In each centre there should be a central collection, processing and storage facility at minimum. In Broome, Yirrkala and Weipa the existing nursery and bush re-vegetation facilities need to be upgraded and expanded. There should be high valued adding processing capacity in Broome and Darwin and potentially the other centres as well. The size, scope and form of investment is open to debate, however, a sum of \$50 million over five years would give northern Australia a substantial advantage in making the kakadu plum industry a profitable domestic and export industry. This is a modest outlay when compared to the public subsidy and investment in other primary industries by Commonwealth, State and Territory governments.

Aboriginal Enterprise and the Future Kakadu Plum Industry

A boriginal homelands and other community enterprises invariably take the form of cooperative corporations and are registered and regulated through the Office of Indigenous Corporations. One of the priorities now is for Aboriginal corporations to run as cooperative profitable businesses that distribute their profits back to their members. This requires cultural change because in the past there have been limited possibilities of generating profitable income through business activities. There is less a need for bureaucratic adherence to rules and more of a focus on building long term businesses and partnerships with non-Aboriginal enterprises and investors. This is not something that can be achieved over night and it is often a tricky transition. In the case of kakadu plum encouraging the collection and storage of food that will be sold as a mass for profit is in itself very different from the usual community management role of Aboriginal corporations and also from the traditional hunting and gathering role where food was consumed as it was found. Even the North east Arnhem

²⁷ <http://statedevelopment.qld.gov.au/industry-development/biofutures.html/>

land 400 year old trade of trepang revolved centrally around bartering for goods and most of the processing and gathering was done by the visitors. Fabric, tobacco, steel was highly valued but the rupiah (coins) brought by the traders to pay for trepang may still be found buried in large mounds on remote beaches. As this suggests a new cooperative culture will be necessary for homelands organisations and the hunting and gathering groups who have the potential to harvest kakadu plum in great quantities. The evidence of particularly the Wadeye, Palngun Wurnangat Aboriginal Corporation and Kindrid Spirits partnership shows that with the right investment, support and revenue flowing to harvesters, a new productive culture can and will be achieved. Similarly long term homelands entrepreneurs and families such as Bruno Dann and family based enterprises such as Kimberley Wild Gubinge show that it is possible for strong relationships to develop between private retail outlets and to high end consumers directly.

Even in this early phase of the Kakadu Plum industry, and with a very limited capacity for collecting and processing the plum, Aboriginal individuals and families in Broome earned up to \$5000 in a fortnight in a good season. At Wadeye the Palngun Wurnangat Association aimed to create 200 seasonal 3-4 month jobs and to produce 110,000 dollars in additional income for the community. As this indicates the harvesting of kakadu plum can form an important supplement to Aboriginal income in regional towns, urban environments and remote homelands.

The income of registered Aboriginal wild harvesters of native foods, who are authorized by traditional owners and landholders, should be deemed tax free and should be neutral for the purposes of all Commonwealth welfare payments including especially unemployment, disability and pension payments. While “hobby or hobby farm income” *is not taxable* if it is sporadic and under \$18,000 per annum, such income has problematic complications for Commonwealth Centrelink allowances. For this reason this report strongly argues that the seasonal income from harvesting kakadu plum should be seen as symbolic of the traditional Aboriginal ownership of land and native foods and should

belong to a special category of income that is untaxed and allowable as supplementary income that does not effect payments by Centrelink and all Commonwealth and State welfare agencies. The problem with seasonal income from the harvesting of kakadu plum as a hobby is that it comes within a short period. If an individual harvester or family earned over \$989.67-1149.84 in a fortnight then a Centrelink payment could be reduced to zero. This would discourage harvesters from fully participating in the annual harvest. In Broome one family was able to gather 255 kilograms of kakadu plum in a two week period earning \$5000. Evidence suggests that many Aboriginal harvesters in Broome collect only enough kakadu plum to be able to retain their allowances. We should be encouraging Aboriginal harvesters to collect the maximum wild harvest yield possible and to derive an appropriately income for that work which is an extension of traditional hunting and gathering with major health and psychological benefits. As the world's greatest social entrepreneur Dr. Muhammad Yunus argues "If we can turn unemployment into entrepreneurship, the amount of human creativity, talent and productivity we will unleash is almost beyond measuring". In the case of the kakadu plum and Aboriginal traditional knowledge this would be a truly righteous and rewarding outcome with benefits for Australia as a whole.

In a recent address in Sydney Professor Yunus the inspirational founder of the People's Bank of Bangladesh reflected on the lessons of bringing micro-finance to the United States. The irony he noted was that as soon as people start to get on their feet with a micro-loan their social benefits are cut off throwing the individual's self-employment strategy into chaos. Professor Yunus noted that government policy wants to create the perfect poverty trap from which no-one can possibly escape. Professor Yunus' sentiments match the last ten years of work of the ISX where so many small enterprises have not started because any form of self employment would jeopardise the stability of welfare or disability payments. The United States is also a very useful example of why a minimal welfare state is not the answer either, this creates a situation where people work many jobs and still struggle. Instead of seeing

the first steps of self employment as something to encourage, the modern welfare society discourages these steps by stripping away an individuals social benefits.

If the kakadu plum industry is going to be a success, not only for Aboriginal Australia, but for the nation as a whole then public investment ie welfare dollars must be seen as a foundation stone for the future development of the industry. The potential income to registered Aboriginal harvesters that can come from the kakadu plum industry should supplement their existing forms of income from welfare or work and should be completely tax free for at least the next ten years. This will motivate Aboriginal people to really develop their bush orchards and to support their community mutual and cooperatives such as Mamabalanjin in Broome, Palngun Wurnagat in Wadeye and Gunddjejihmi in Darwin.

In Broome one Aboriginal family was able to gather 255 kilos of Gubinge and received over \$5000 in income in a two week period. Other individuals gathered small amounts in the range of 10 kilos and used the income to supplement their weekly shopping, to pay for school books, uniforms for their children. The average income for the 157 harvesters in Broome in 2016 over that year's harvest period from 5 January to 26 February was \$281.30. In the 2017 harvest there was a smaller window of buying only 3 days and only 70 harvesters brought Gubinge for sale. In 2017 the average income for a harvester was \$483.70.

The importance of the Kakadu plum for the contemporary sustainability of remote Aboriginal homelands and regional and remote communities in Australia's North is unprecedented. The current harvest of Aboriginal sources kakadu plum is estimated to be between 5 to 10 tonnes per year.. The price for a kilo of un-processed fruit to an Aboriginal harvester where there is a community hub is \$20. The current price for processed fruit can be as high as \$85. Some estimates are that the price for a kilo of processed fruit could rise as high as \$760.²⁸ Other unsourced claims are that the demand from China alone could rise to 100 tonnes a year²⁹. In their recent report for the Australian government PWC Indigenous Consulting argue that there is substantial scope for the industry to be price makers not price takers. PWC

²⁸ *Emerging Business Models*, p.22

²⁹ *Emerging Business Model*, p. 23

Indigenous Consulting also predict exponential growth in demand for the plum³⁰. But this remains to be seen in the international market place given that Australia's north is for the time being the sole provider of Kakadu plum and its value added products.

Even within the current price range there are opportunities for Aboriginal individuals, communities, families and commercial businesses to create income, even using existing infrastructure and distribution systems. The potential revolutionary role of the Kakadu plum as a source of income for Aboriginal individuals has been demonstrated and proved by Mamabalanjin Aboriginal Corporation in Broome and the Palngun Wurnangat Aboriginal Corporation in Wadeye. With the support of philanthropists and government investment these organisations bought and sold over eight tonnes of Kakadu plum from individual harvesters in and around the town of Broome and from a remote Aboriginal community centre at Wadeye in 2016 and 2017. In the process \$160,000 in direct benefits was distributed to community harvesters in both communities and although it took time the wholesale organisations were able to make a profit on their purchases.

At first sight the individual income of Aboriginal harvesters seems small. However it should be observed that there is great potential demand for kakadu plum and it is readily storable for up to four years as a refrigerated product. There are few Australian agricultural products who have these characteristics and are as a form of wild harvest very economical to maintain and nurture. The other characteristic of the kakadu plum industry is that it encourages Aboriginal people to be on their own country and to walk and appreciate their lands. The benefits of health and well being for such a natural practice are incalculable but it is clearly something that spans the chasm between the modern world and the ancient past. For the first time a natural Australian product with the capacity for vast commercial development will provide a source of income for Aboriginal custodians and owners to properly invest in the infrastructure necessary to support their landholdings.

There is a strong confluence between Aboriginal land care and environmental management

³⁰ *Emerging Business Models*, p. 1-2

strategies and the emerging kakadu plum industry. The Kakadu Plum industry will have a significant and lasting potential impact on Aboriginal land stewardship. The emerging industry may allow communities to look after their land and to gain an income from activities that connect them to healthy traditions. In remote communities with air access and regular flights in and out for routine health and infrastructure services there is the possibility of creating a kakadu plum network that will substantially expand the harvest of Kakadu plum. There is no current primary industry that could provide such a sustainable and long-lasting income that is in keeping with traditional Aboriginal land stewardship practices. Even in its early stages it is more environmentally and economically feasible for a small community to be involved in Kakadu Plum harvesting, with relatively little infrastructure investment required, than say investing in a traditional primary industry such as cattle. The traditional burning practices in North East Arnhem land and across the North also enhance the productivity of bush orchards and kakadu plum production in ways that traditional stewards readily understand. Mosaic burning is not just something to reduce hot fires or for carbon credits, it also has an intimate relationship with bush food cultivation and bush orchard development. It is no accident that kakadu plum trees grow thickly in areas where traditional burning is common place. The relationship between cultivation, propagation of native fruits and lie beyond the scope of this report but it is an important to point out that there is a link between native fruit productivity and mosaic soft burning when it is undertaken by experts in the field, namely Aboriginal people who have retained traditional knowledge about this important arena of Aboriginal agriculture.³¹ Certainly there is a clearer link between burning and underground tubers and yams, however, it is also the case that the propagation of seeds of even fruit trees is triggered by soft burning in small, constrained areas at the right time of year. All these areas are important potential linkages between rangers groups that are being formed across northern Australia and the kakadu plum industry.

The most advanced Aboriginal owned conventional orchards and nurseries for kakadu plum are in the Broome and Kimberley region. It is here over two decades that experimentation

31 <https://capeyorkfire.com.au/2018-workshops/national-indigenous-fire-workshop-nsw>

has occurred around propagation of seedlings and the creation of plantations. There are also established non-Aboriginal owned plantations in the Darwin region. Banduk Marika's Dundungurr Nursery at Yirrkala was also probably amongst the first Aboriginal owned enterprises to successfully propagate Kakadu plum in relation to mining rehabilitation. There is a very great economic opportunity for Aboriginal owned nurseries, ranger groups and businesses like Mamabalinjan, (Broome) Yolngu Business Enterprises (YBE) (Nhulunbuy) to create bush orchards in areas of rehabilitation after strip mining operations like the bauxite mines of Gove and Weipa where hundreds of hectares are required to be rehabilitated back to a native state each year. Mamabalanjin has also led the way in creating conventional plantations of Kakadu plum or Gubinge. There is a very large potential for the sale of trees as house and bush block plants throughout Northern Australian from Carnarvon across to Brisbane. It is possible to envision a virtuous circle of investment and income in which mining companies invest in Kakadu plum development as part of native re-vegetation and this then forms an income base for traditional owners and land stewards and custodians.

Sacred Food: Modern Consumers and Aboriginal Provenance, Culture and Sustainable Development

“If you lose that link between Aboriginal people and bush food, then you lose everything. It's hollow. It's nothing” - Rayleen Brown³²

How can future developments around kakadu plum further benefit the Aboriginal people of Northern Australia? One of the important roles of a kakadu plum/native fruit marketing authority would be to regulate a cooperative network of Aboriginal harvesters, whole sale distributors, retail outlets, catering and marketing organisations that work together.³³

The idea of a “Sacred Food” network was first mooted at the Broome ILC Gubinge symposium of March 15, 2017. The concept was to create a marketing label that would signal to consumers the unique provenance of Australian native foods. This follows the

³² Merne Altyerre-ipenhe (Food from the Creation Time) Reference Group, Douglas, J. & Walsh, F. (2011). Aboriginal people, bush foods knowledge and products from Central Australia: Ethical guidelines for commercial bush food research, industry and enterprises. Desert Knowledge CRC Report, 71. Alice Springs, NT: Ninti One, p. 26 cited in Higgins-Desboilles et al, Indigenous Foods Benefiting Indigenous Australians,

³³ ILC Conference Broome, PwC Indigenous Consulting Emerging Business Models for the Kakadu Plum Industry, Nov 2017

lead of other Indigenous nations across the world.³⁴ The American Intertribal council licenses the use of their “Made/Produced by American Indians” trademark and a similar process is envisioned for the sacred food trademark.³⁵

The concept of a sacred food for retail purposes needs to be disentangled from sacred Aboriginal law. In traditional ceremony there are sacred foods that have meanings and symbolism that Aboriginal initiates and community members learn about. The learning goes on all their lives from the so-called outer circles of knowledge to the inner circle of knowledge that only men and women with grey hair, after a life time of study and meditation, can understand. This kind of sacred food belongs only to Aboriginal custodians. It is distinct for each Aboriginal nation and community and is specific to language, geography, cosmology and knowledge systems and peoples.

The concept of sacred food label for the purposes of advancing kakadu plum as a twenty first century sustainable, wild food industry is something different. At minimum the labelling of kakadu plum products should include a sacred food label with the traditional Aboriginal name of *terminalia ferdiniana*, the people who harvested the product and the traditional land from which it was harvested. The sacred food label should also link food with knowledge about how to look after land and health. In this way the sacred food label would protect Aboriginal provenance and commercial property and intellectual rights in the day to day market activity of contemporary society. The idea of the sacred food label is that different Aboriginal philosophies of sustainability can be shared with, owned and appreciated by the world. It would bring a sense of one-ness with the land and appreciating the world's oldest continuously evolving cultures.

The sacred food logo could also indicate that the organisations involved in the production of the food are Aboriginal owned, managed and that income flows back to Aboriginal people and communities. In this respect it would be much like the “Made in Australia” logo in informing consumer decisions about which products they buy.

34 <http://www.indianaglink.com/our-programs/american-indian-foods/>

35 http://www.americanindianfoods.com/wp-content/uploads/2010/06/2009-02-27_trademark_application.pdf

In summary a sacred food logo would be a marker of Australian Aboriginality. It would guarantee that the product is an Australian native fruit sourced in Australia. The logo would educate consumers about an ancient food whose modern “discovery” derives from Aboriginal knowledge and the experience of living in the Australian landscape with continuous knowledge that goes back 60,000 years. A sacred food trademark would also denote “wildness” and the idea of a food that did not grow in energy intensive Western agricultural systems but in the wild orchards and groves of the bush with no conventional cultivation. A sacred food trademark would also guarantee that the food was harvested by Aboriginal people and was processed and sold in ways that ensure Aboriginal communities derive a strong percentage of any income from sales. In other words sacred food would contribute to Aboriginal economic sustainability within and alongside the mainstream economy.

By marketing native foods as sacred food, Aboriginal people would gain a real competitive advantage from their existing life practices involved in caring for the fragile ecology of the Australian landscape that has been so misunderstood and abused by Western agricultural and living systems.

Kakadu plum may just be the beginning of a major native fruit industry for Australia. There are many wild foods that are known to Aboriginal communities that are only just being discovered by Australians and the rest of the world. Kakadu Plum is the latest most spectacular example. However other Australian native products like the macadamia nut, eucalyptus oil and the acacia have been very quickly understood and commercialized elsewhere. The concept of sacred food would allow world consumers to understand the provenance and knowledge systems behind Australian native fruits and other products.

There is also something true to Aboriginal philosophy about the concept of sacred food. The true goodness of the food can only be captured by understanding its place in the land and the seasons. Sacred in this respect asks us to envision a world in which human beings are not just consumers and actors but are related to trees and fruit as family

members. When searching for Kakadu plum in North East Arnhem land the harvester calls the name of the fruit [n̄ṅka-bakarra](#) and imagines its properties and uses and, if all is well, and the season is right, it appears in the quantity and quality it is needed. Just as a relative may be appreciated for a kindness, the tree is thanked, appreciated and remembered. When hunting and gathering in this way the bush itself takes on many different qualities. It is not just a mass of flora and fauna. It is truly a garden with unique characters and features and dynamics. Aboriginal people learn over the course of their lives the extraordinary intricate connections between water systems, winds, underground aquifers, plants and animals. By buying a sacred food a consumer becomes in a sense a family member too. They invests in a way of life that just cannot be substituted by the written word, by films or videos or how to manuals or by creating plantations of trees. By investing in sacred food consumers reverse the destruction of Aboriginal society and culture. They are valuing a product that allows Aboriginal people to glory in one of their finest attributes their capacity to live and protect native ecological systems.

Kakadu Plum: Ancient Culture, Lessons for the Future

Healthy human lives, land, plants and animals are ineluctably linked. Kakadu plum is an ancient food recently discovered by twenty first century science. It's Aboriginal heritage helps us to unlock the secrets of a better human life and a more sustainable future. Ancient Australian Aboriginal knowledge systems and modern science, when they are intimately linked, can lead us to a new and truly prosperous future for us all in the twenty first century of Western civilization.

Sources

This overview is part of a larger and ongoing set of studies funded by the Indigenous Land Corporation, 2018. For more detail see **Kakadu Plum, Aboriginal Knowledge, Sustainability, Science**, June 2018

Online Interviews Kakadu Plum, Bush Fruit and Aboriginal Horticulture

Value Adding: Kimberley Wild Gubinge <https://soundcloud.com/kangarooova/value-adding-kimberley-wild-gubinge-a-discussion-with-jacinta-monck-and-lenny-omeara>

The Power of Women: Mi Marrarl (Kakadu Plum), Palngut Wurnangat, Coradji and Kindred Spirits <https://soundcloud.com/kangarooova/chris-brady-rose-read1>

A Walk in the BAMA Orchard with Bennett Walker <https://soundcloud.com/kangarooova/a-walk-in-the-garden-with-bennett-walker>

Batumbil Burarrwanga NĀN'KA-BAKARRA <https://soundcloud.com/kangarooova/gubinge>



Gathering food with young *nj̄n'ka-bakarra/kakadu* plum seedlings in foreground, Mata Mata, North East Arnhem Land. Batumbil Burarrwanga