



# Northern Territory Crocodile Industry Transition Plan

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## Acknowledgement to Traditional Land Owners

Kindness Project would like to acknowledge that the land on which the crocodile industry in Australia operates is stolen land. We pay our respects to all Indigenous Elders, past, present and emerging. We acknowledge that sovereignty was never ceded, and Treaty is yet to be signed.

In the debate regarding the existence of a commercial crocodile farming industry in Australia, benefits to Indigenous communities are often widely stated by industry. Kindness Project would like to acknowledge that the crocodile industry in the Northern Territory has created job opportunities in remote Indigenous communities through the harvesting of crocodile eggs, with added economic benefits to the communities through the payment of royalties.

However, we would also like to acknowledge that white people have had, and continue to have, an often unwanted and misguided input into Indigenous lives, and we will not partake in it. What we will say is that we hope the industry's touted benefits are taking into account how Indigenous people would like to use their land in the absence of money as an incentive.





# Introduction

Exposés into the Australian commercial crocodile industry have revealed it to be what many have always suspected; a cruel, unnecessary industry, which exists to cater to the rich. Though the industry boasts high welfare standards, the reality is that in this industry, our native icons are housed in barren pens, deprived of exhibiting natural behaviours such as roaming long distances, and brutally slaughtered at a fraction of their natural lifespan - all to be turned into luxury, designer handbags.

The industry also claims it plays a role in conservation of the species; by putting a dollar figure on crocodile eggs in the wild, they claim that people are less likely to hunt the species, as they are respected for contributing to the economy. However, there are significant flaws to this argument. For example, though initially people were drawn to hunting crocodiles for the worth of their skins, since hunting of crocodiles was banned in 1971, population numbers have steadily increased, even prior to the introduction of farming.<sup>1</sup> The main driver of crocodile culling now is due to their perceived encroachment on communities, and the possibility of fatal and non-fatal events. However, it has been shown that public education programs about crocodile safety are more effective than extensive culling programs at decreasing fatal interactions with crocodiles.<sup>2</sup> There is no reason to believe, as long as hunting bans and community education programs remain in place, that crocodile numbers will fall if the commercial crocodile industry ceases to exist.

Finally, the industry talks of their value to the economy and employment in the Northern Territory, an area where it is otherwise difficult for businesses to grow. However, this raises the question - in a democratic society, what does one do if an industry is socially unacceptable, but economically beneficial? Should it be allowed to continue, or should it be gradually phased out, with employment and economic benefits transitioned into other, more ethical industries?

This report exists to show that a transition out of the Australian commercial crocodile industry is highly achievable, with the right investments. The report first outlines the current state of the industry, and the economic and employment benefits it currently provides, and is predicted to provide in the future. Subsequently, several industries, either emerging or established, are identified as having exciting growth potential into the future, with estimated future revenue and employment numbers provided where possible. This report aims to provide the foundations to a transition out of an unethical industry, in the hope that employment and economic losses are kept to a minimum. However, in order to provide a step-by-step breakdown for how a transition should occur, government (ideally) or private investment is needed to conduct further analysis and help fund new or growing industries in their infancy stages.





## The State of the Industry

The use of crocodiles commercially is mainly through the farming and slaughter of saltwater crocodiles primarily for their skins, though their meat and other by-products are also sold for profit. The Australian commercial crocodile industry exports 90% of skins, with 10% locally finished. Globally, Australia exports more crocodile skins than any other country, accounting for 60% of global trade.<sup>3</sup> The main export markets for skins are Singapore, France, Japan and Italy, where they are usually turned into luxury handbags by high-end fashion houses.<sup>4</sup> In Australia, farm-related tourism is also a source of revenue for the crocodile industry.

Within Australia, two thirds of crocodile farms are located in the Northern Territory (NT). Of the remaining farms in Queensland and Western Australia, most of their crocodiles are sourced from the NT. The economic benefits of the commercial crocodile industry, particularly job creation in a region where this is otherwise lacking, have been widely touted by industry. The most recent economic analysis of the industry was undertaken in 2017, based on figures from the 2014-2015 financial year (FY).<sup>5</sup> Other reports indicate the economic value of the industry has been stable since that time.<sup>6</sup>





## ***Economic Contribution***

The economic contribution of the industry to the NT is the interplay between direct revenue, indirect increased output of other industries, and the cost of production. In essence, it is the sum of all wages, income and profits generated by industry.

Total revenue of the NT commercial crocodile industry has been stable at around \$25 million (m), with approximately 75% of this revenue from sales of skins.<sup>3</sup> Skins sell for between \$300-\$1000 each depending on quality<sup>5</sup>, with around 63.5% of revenue from the production of first-grade skins.<sup>6</sup> Meat and other by-products generate another \$200 of revenue.

During the 2014/15 FY, the total economic contribution of the Industry, from both direct and indirect effects, was \$106.8m. In value added terms (ie. minus the costs of goods and services used in the production), this is \$54.3m. This represented approximately 0.23 per cent of the Northern Territory Gross State Product (GSP).<sup>5</sup>

Operational expenditure of the farms provided the largest proportion of the economic contribution, estimated at \$19.9m (in terms of total value added) across the NT. This includes the direct economic contribution from on-farm employment, consumables and marketing costs, and the indirect economic contribution of employees spending their wages locally.

Farm-related tourism operations are estimated to value-add \$17.0m to the NT economy, though this figure is based on a number of assumptions surrounding the behaviour of tourists. This value includes the operational and capital costs to provide the tourism service, and also the expenditure of visitors whilst they are in the NT.

The next largest area of economic contribution is farming capital expenditure, totalling a value-added \$9.4m. Capital expenditure includes works to improve farm facilities such as construction and equipment.

Expenditure related to industry regulation is valued at \$4.6m (value-added). As most regulation is done through government employees, this work was valued by considering the potential loss of not having this service. It also includes the employment of those who work for the National Land Council, who monitor the egg harvesting program and royalty payments.

Vet services contributed \$1.4m of value added.

It was estimated that 96.5% of total value added was generated within Darwin and the surrounding area, with the remainder attributable to regional areas.<sup>5</sup>



## Employment

During the 2014/2015 FY, the total (direct and indirect) employment generated by the industry was estimated at 264 full time equivalent (FTE) jobs, as summarised in the tables below.<sup>5</sup> This represents 0.002% of NT's total employment.<sup>7</sup>

	Direct	Indirect	Total
<b>Darwin and surrounds</b>	154	91	245
<b>Remote NT</b>	14	5	19
<b>Total</b>	168	96	264

Table 1: Employment by region

	Direct	Indirect	Percentage of total employment in each area (%)
<b>Farm Operations</b>	39	30	26.14
<b>Farm Construction</b>	18	14	12.12
<b>Farm related tourism</b>	80	35	43.56
<b>Regulation</b>	13	10	8.71
<b>Veterinarian/ Scientific Services</b>	4	3	2.65
<b>Remote Impacts</b>	14	5	7.20

Table 2: Employment by area





As can be seen, most employees were employed in Darwin and surrounding areas in the tourism, construction and farming sectors. Direct employment refers to workers directly involved with the commercial crocodile farming industry, while indirect employment refers to employment generated as a flow-on effect from the direct contribution, such as the output of other industries that the NT crocodile industry is a customer of.

Total public sector jobs involved with the industry (29 FTE) accounted for 0.08% of all NT public sector jobs whereas private sector jobs in the industry (235 FTE) accounted for 0.24% of all jobs in the NT private sector.

The estimated employment generated in remote communities as a result of royalty payments to indigenous communities was 19 operational FTE workers.<sup>5</sup>





### ***Impacts of Industry on Remote/Indigenous Populations***

Most of the economic contribution to remote communities is from the harvesting and ranching of wild eggs. Much of this harvesting occurs on Indigenous-owned land, creating a unique job opportunity for members of the local communities. Indigenous communities are also provided with royalty payments for the use of their land for this purpose. According to Wildlife Management International, the royalty payments are \$18 per live egg harvested (40% of the total hatchling value).<sup>8</sup>

The economic contribution within remote communities as a result of royalty payments was \$2.1m. The cost of ranching, including the royalty payment, suggests that the cost of collecting an egg is in excess of \$105 per egg.

The employment created from egg collection in remote communities was 19 jobs (14 direct and 5 indirect).<sup>5</sup>

### ***Projections for the Future***

The NT crocodile farming industry is considered to be a pioneering and fast-growing industry, with ambitions to double in revenue over a five-year period.<sup>3</sup>

Indeed, the development of a new crocodile farm by luxury fashion brand, Hermès, and head of the Crocodile Farmers Association of the NT, Mick Burns, is a signal of the industry's hopes for the future. The farm is set to hold 50,000 crocodiles once fully built, which will increase the number of farmed crocodiles in the NT by 50%. Development costs have been reported to be \$40 million, and 170 jobs will be created for the construction process. Once the farm is in full production, it will require the employment of 30 workers.<sup>9</sup>

Taking this into account, it seems fair to say that once the farm is completed, the total value-added contribution of the crocodile farming industry to the NT economy will also increase by 50% - ie. to approximately \$80 million.





# Transitional Opportunities

Transitioning out of an industry is an undoubtedly complex process, however it is not impossible. There are various alternative industries that resources could be invested in and provide similar economic and employment returns as the NT crocodile industry does.





## Solar

The NT is considered one of the best places in Australia for solar energy generation due to its high levels of solar radiation. Indeed, the NT Government has committed to a target of 50% renewable energy by 2030, with the majority of this power planned to come from solar photovoltaic (PV) systems. Projects are already underway to meet this target (9000GWh pa), which would require 450MW of flat plane PV solar to be constructed, over a mere 700 hectares.<sup>10</sup>

Currently, renewable energy makes up 5% of NT's total energy generation<sup>11</sup>, with approximately 190 people employed in the renewable energy sector.<sup>12</sup> It is estimated that 10 gigawatts (GW) of PV solar could be installed in the NT, which would be 10 times the amount of energy that is currently generated in the NT, and 20 times the 50% renewable target.<sup>11</sup>

Creating a solar network of this scale opens up opportunities for growth in other areas such as storage systems with batteries and hydrogen, and renewable exports. Factoring these in, it has been estimated that the total potential economic impact of the industry could be the creation of an extra \$2 billion per annum of revenue, and 8,000 jobs.

Further, this amount of PV solar would only require 152 square kilometres of land. To put this into context, this is only 1.8% of the famous Victoria River Downs cattle station. In fact, enough solar to generate power for the whole of Australia would still only take up 0.06% of land in the NT.

Creation of such a system is estimated to require approximately \$20 billion to build at current prices, however it is likely the end cost will be less than this as technology becomes more widely utilised and cheaper. Regardless, this price is still cheaper than Australia's recent Ichthys LNG project, which cost \$54 billion.<sup>11</sup>



## **Jackfruit**

Jackfruit is a tropical fruit produced in the NT and northern Queensland. It has been identified as a growing market due to its versatile use in cooking, particularly as a pulled pork alternative,<sup>13</sup> and between 2006 and 2011 production almost doubled.<sup>14</sup> All Australian-grown jackfruit is consumed domestically, and no jackfruit is imported.

Currently the estimated annual production of jackfruit is 700-800 tonnes, and the industry is valued at \$2.6m. The NT accounts for 78% of the industry, generally located within a 100km radius of Darwin - similar to where much of the crocodile farming industry also operates. The production season varies depending on location, but in the NT production mainly occurs between July-October.<sup>14</sup>

Jackfruit is recognised to be a sustainable crop; on a per hectare basis, jackfruit produces 8 times more edible fruit than traditional beef products.<sup>15</sup>

It is estimated that the jackfruit industry has the potential to be worth four times its current value (\$10m per annum), and is considered to be one of the best emerging industries to invest in.<sup>16</sup>

Additional value-add opportunities to fresh jackfruit include processing jackfruit into canned or dried varieties, so consumers can more readily utilise the fruit, and also processing the seeds and skins for use. If 10% of the NT's current production of whole jackfruit is processed in this way (58 tonnes), it is estimated that this could create 10 new jobs per processing facility, and a net profit of \$44,000 per annum. Put in another way, building of a processing facility dedicated to value-adding jackfruit products would result in a 10% return in investment for this quantity of whole fruit processed. Though this could be considered a high-risk investment, options to reduce the risk of loss include combining this with existing fruit/vegetable processing industries to achieve economies-of-scale.<sup>14</sup>





## Taro

Taro is a tropical vegetable that is consumed for both its starchy tuber and leaves. Australia produces 1,000-1,500 tonnes annually; there are 30-40 growers, and in 2012 the industry was valued at \$5m. As a low GI health food, taro has been identified as an emerging industry in Australia, particularly as Australia is free from common pests/diseases that are present in most other countries that produce taro.

Currently over 2,000 tonnes of taro is imported. Though taro can be produced more cheaply overseas, if operating costs can be decreased in domestic production, and export opportunities are explored, it is estimated the industry could double to triple over a period of 10-15 years.<sup>17</sup>





### ***Pitaya (dragon fruit)***

Pitaya, more commonly known as dragon fruit, has risen in popularity in recent years due to its recognition as a “superfood” and also for use in cosmetics. In 2012, the industry turnover was estimated at \$2.3m, with 62.2% of the industry located in the NT.<sup>18</sup>

Australia currently imports a large amount of dragon fruit from Vietnam, however there is potential for the industry to grow to be valued at \$5-10m if suitable investment into the industry is provided.<sup>16</sup>

### ***Other niche emerging industries - Okra/Bitter Melon/Snake Bean***

Other niche industries that have been identified to be “emerging” are industries such as okra, bitter melon and snake bean. All three are widely used in Asian cooking, and known to have health benefits. They also each have unique potential for growth in Australia; okra is very drought-resistant, bitter melon suits the NT winter climate, and snake beans are currently not allowed to be imported into Australia.

In 2012, all three industries combined had a turnover of \$10m, with the potential to grow to \$16-25m over 10 years if invested in.<sup>16</sup>





### ***Other horticultural crops - Mangoes, melons***

As well as investing in new/emerging horticultural crops, there is also potential to grow current successful industries. Due to long transportation distances and costs of crops in the Northern Territory, it has been shown that high value horticultural crops, such as mangoes, melons and bananas, are likely to return the highest gross margins (as opposed to low value/high yield broadacre crops such as grains).<sup>19</sup>

One of the factors involved with growth of horticultural agriculture in the Northern Territory that has previously been considered a limitation is the requirement of irrigation systems for horticultural crops. For this reason, dryland farming of crops has previously had much more interest and investment. However, research indicates that there is actually enough of a water reservoir in the rivers of the Northern Territory to scale up irrigated agriculture from 150,000 ha to 1.4 million ha (approximately 9 times), even factoring in the seasonal variation of rainfall.<sup>19</sup>

The mango industry is currently the largest horticultural industry in the NT by value, with a GVP of \$88.5 million and land usage of 6030 ha. It represents 40% of the national mango growing industry. Most mango grown in the Northern Territory is consumed domestically, with a very small export market. Most mango is sold fresh, with a very small component sold for processing. The NT mango industry employs around 120 permanent staff, and an additional 2,500 people for 5-8 weeks during October/November (peak harvesting season). From these figures, average economic return of the mango industry is ~\$14,000/ha, with approximately one permanent employee required per 50 ha, and one casual employee required every 2.5 ha.<sup>20</sup>

The NT melon industry is the second largest horticultural industry, with an average GVP of \$70 million and a land usage of 1,500 ha. There is a small export market developing, but most consumption is domestic. In 2015, the industry employed 37 permanent staff and 510 casual staff over the period between May to November. Certain disease risks make melon a more risky crop to invest in than others, but there is certainly still potential for the industry to expand.<sup>20</sup>





## ***Sandalwood***

Sandalwood is harvested for its high value oil, which is used in cosmetic products, and can generate huge returns of up to \$65,000/ha.<sup>19</sup> There are approximately 6000 ha of sandalwood plantations in the NT, however the industry is still currently in its infancy stage of growth, and will likely only be ready for harvest in around a decade. As well as the harvesting of the wood, there is also the possibility of building a sandalwood processing facility in Darwin, which would also increase employment opportunities.<sup>21</sup>





## Plant leather

Plant leather, or bioleather, is another emerging industry that is increasing in relevance as sustainability becomes a greater societal and consumer concern. Bioleathers, usually made from fruit, utilise parts of fruit that are usually wasted in the production and consumption process. In this way, they do not require any additional land to grow produce, and as such are a much more environmentally friendly way of producing leather compared to traditional, animal leathers, even taking processing into account.<sup>22</sup>

Two commonly used fruit for this purpose are mangos and pineapples, both of which are produced in the NT. Pineapple leather utilises pineapple leaves to create a 95% biodegradable product, also known as Pinatex. Usual practice is for these leaves to be discarded or burned; it is estimated that 264 tonnes of CO<sub>2</sub> are saved on average each pineapple harvest if the leaves are processed into leather instead of burnt. Pinatex is already used for clothing, accessories and upholstery by major brands worldwide, and is cheaper per square metre to buy than conventional leather (~30 AUD vs 40-50 AUD respectively).<sup>23</sup>

Mango leather, on the other hand, utilises discarded fruit to create a leather product. Approximately 40% of fruit in a harvest are left in the field as they do not meet the cosmetic standards of supermarkets.<sup>24</sup> Fruit leather Rotterdam is one company that has found a way to partner with producers to turn fruit that would otherwise be discarded, into leather products. Luxtra has even made a mock-crocodile skin clutch made out of this material.

The global synthetic leather market is expected to be valued at USD 78.5 billion by 2025, growing at a CAGR of 4.4%. As technology improves it is expected bioleathers will gradually begin to become the dominant form of synthetic leather, replacing conventional polymer-based materials.<sup>25</sup>

To our knowledge, Australia currently has no dedicated plant-leather manufacturing companies. With its large production of mangoes, the NT could be an ideal place for the industry to begin, and tap into the potential of using otherwise waste products as an additional income stream. It should be noted that the commencement of such an industry would require initial capital investment as suitable processing facilities would need to be built. Unfortunately there is currently a lack of data on economic and employment returns of such an investment, however given the market is predicted to continue growing at a rapid rate into the future, reasonable returns would be expected.<sup>26</sup>





## Ecotourism

In 2018-2019, the tourism industry in the NT provided 9.5% to the economy; \$2.2 billion in total, with \$1 billion from direct contribution and \$1.2 billion from indirect contribution. Direct contribution refers to direct goods/services consumed by tourists, while indirect contribution refers to the expenditure of other industries due to their use by tourists. In 2015, it was estimated that 11.5% of NT employment is within the tourism industry, and in 2018-2019 17,100 people were employed in the industry.<sup>27</sup>

Nature-based activities have been identified as a competitive advantage for Northern Territory tourism,<sup>28</sup> and it is estimated that 27% of visitors to Darwin are there for wildlife-related experiences.<sup>5</sup> Pre-COVID, it was predicted that the tourism industry in the Northern Territory would continue to grow to provide an additional \$117 million in GSP (the industry was valued at \$2.2 billion in 2017-2018), and an additional 3900 jobs by 2030.<sup>27</sup> Even taking the COVID-19 pandemic into consideration, given that 90% of visitors to the NT are domestic tourists, it seems likely that the industry will still continue to grow, though perhaps less than projected.<sup>29</sup>

Ecotourism in regards to crocodiles could look like an adaptation of ethical safari/wildlife tours in other areas of the world, where crocodiles are viewed in their natural habitats by means of tours by wildlife rangers. Ecotourism has been increasing in popularity in recent times, particularly as awareness around land clearing/biodiversity loss, as well as the welfare issues of viewing animals in captivity, increases. When managed properly, ecotourism has also been identified as a way to both conserve the wild (which has been identified as something most of the population values) and generate income (which is important as, in our society, often a financial incentive is needed for investment in environmental projects).<sup>30</sup> Given there is already demand for crocodile-related tourism in the NT, it seems fair to assume this would continue even if tourism operations moved from farms into the wild.

It is important to note that a move like this would likely require wildlife tourism operations to be conducted in Native Title land, and as such, can and should only be conducted with permission from the First Nations' owners of the land. If culturally appropriate, as explored in the next section, these kinds of opportunities that merge connection to Country and economic contributions, can often be ideal for benefitting Indigenous communities both financially and socially.





# Remote/Indigenous Opportunities

Approximately 50% of land in the Northern Territory is held under inalienable freehold title to traditional landowners, and is managed by local land councils.<sup>29</sup> Unfortunately, despite the Land Rights Act being initially created to give First Nations peoples ownership over their traditional lands, too often this land is still used for colonialist purposes, with a payment of royalties provided to community leaders. Though this can be financially advantageous to communities, it is recognised that royalties do not always have positive social outcomes if the use of the land is not in alignment with Indigenous values.<sup>8</sup>

Indigenous communities are recognised to be socioeconomically disadvantaged compared to non-Indigenous communities, which results in poor education, health and employment outcomes. One reason for this is the lack of weight given to Indigenous aspirations for the use of their land. True recognition of Indigenous land rights requires more than just an allocation of a proportion of land, but also a consideration of First Nations' connection to Country, and how to utilise land in a culturally respectful way.<sup>31</sup>

Though Kindness Project recognises that any use of Indigenous Native Title land should be in full consultation with the First Nations' communities that rightly have ownership rights to this land, there are some potential uses of the land that have been identified as possibilities to replace the jobs created in these communities through the harvesting of wild crocodile eggs, which may be culturally appropriate.





## ***Carbon Abatement Projects***

Carbon abatement projects are one such example of this. Late-season wildfires in the Northern Territory, and the greenhouse gas emissions associated with these, have been recognised to be reduced by traditional prescribed burning practices.<sup>31</sup>

There are currently 14 Indigenous-owned carbon projects in the Northern Territory, which represent over 80,000 square kilometres; together they account for a significant reduction in Australia's carbon emissions.<sup>32</sup> Savannah burning projects are paid through the form of Australian Carbon Credit Units (ACCU); one unit represents one tonne of carbon dioxide equivalent stored or avoided. One of the major savannah burning projects in the Northern Territory generates more ACCUs than any other carbon abatement projects (of any category) in Australia.<sup>33</sup>

It is estimated that five of the major fire management projects, managed by nine Indigenous ranger groups in the NT, employs 316 Indigenous people,<sup>33</sup> and has a minimum turnover of \$10 million per annum,<sup>31</sup> with the potential for further growth.

## ***Other Ranger Programs***

There are currently 46 ranger groups throughout the NT, with over 1000 rangers employed. Another possibility for economic growth and job creation is further investment into Indigenous-led ranger groups to help manage the consequences of wildfires, cyclones and floods - an area that may increase in relevance as our climate continues to change.<sup>34</sup>

Investment into creating opportunities for Indigenous people to work on land - as opposed to working in areas that do not align with cultural values - is estimated to result in significant welfare and economic benefits of between \$150-450 million per annum.<sup>31</sup>





An area within agriculture that may also be further developed by Indigenous communities is the harvesting of the native fruit, kakadu plums. Kakadu plums have long been a common food consumed by First Nations people, and due to their high vitamin C content and antioxidant properties, commercial markets as a health food have been growing.<sup>35</sup>

In 2016, powdered kakadu plum sold for \$500/kg. It is estimated that between the 2018-2019 financial year over 400 people (mainly women) were involved in the harvesting of kakadu plums in the Northern Territory, with 20 tonnes collected at a farm-gate value of \$650,000.<sup>36</sup>

There are three main kakadu plum production systems: wild harvesting, enrichment planting and monoculture cropping. Most Indigenous people in the Northern Territory are involved in the wild harvesting production system, either as cooperatives, communities, family units or individuals, while enrichment planting has been utilised more in Western Australia than the NT. The main producer of monoculture kakadu plum crops in the Northern Territory has a non-Indigenous owner, a common and unfortunate occurrence when traditional customs are scaled up to capitalise on growing demands.<sup>35</sup> In an ideal circumstance, Indigenous people would be assisted to create business models that still incorporate connection to Country in order to scale up to meet market demand, without having to compete with capitalist interests.<sup>37</sup> Indeed, in 2004 two multinational corporations tried to export kakadu plum tissue culture out of Australia without permission or benefit-sharing agreements, and utmost care must be taken to ensure such things do not occur if an upscaling of the industry were to occur.<sup>35</sup>

It is estimated the potential value of the industry could grow substantially,<sup>38</sup> and it has been recommended that further research into the industry would be a valuable area of investment for government.<sup>39</sup>





# Summary

Industry	Current value	Current jobs	Potential value	Potential jobs
<b>Solar</b>	Data not available	190	\$2bn	8000
<b>Jackfruit</b>	\$2.6m	Current employment figures unavaialble	\$10m	Potential to increase x4
<b>Taro</b>	\$5m	Current employment figures unavaialble	\$15m	Potential to increase x3
<b>Pitaya (dragon fruit)</b>	\$2.3m	Current employment figures unavaialble	\$10m	Potential to increase x4
<b>Okra/Bitter Melon/Snake Bean</b>	\$10m	Current employment figures unavaialble	\$25m	Potential to increase x2.5
<b>Mango</b>	\$88.5m	120 full-time 25000 casual (during harvesting)	\$14,000 per hectare increased	One permanent employee per 50 hectare increased One casual employee per 2.5ha increased
<b>Ecotourism (likely to be mainly Indigenous led)</b>	\$17m (specifically crocodile related tourism value)	115 (specifically crocodile related tourism employment)	Likely to stay similar with a transition from farm to wild tourism	Likely to stay similar with a transition from farm to wild tourism
<b>Sandalwood</b>	Industry still in infancy stage	Industry still in infancy stage	\$390m	Unable to predict based on current data
<b>Plant leather</b>	0	0	Unable to predict based on current data	Unable to predict based on current data
<b>Melon</b>	\$70m	37 full-time 510 casual staff (during harvesting)	\$45,000 per hectare increased	One permanent employee per 40 hectare increased One casual employee per 3 ha increased





Industry	Current value	Current jobs	Potential value	Potential jobs
Indigenous led wildlife rangers	Data not available	1000+	Gains dependent on funding provided	Gains dependent on funding provided
Indigenous led carbon abatement projects	\$10m	316+	Gains dependent on funding provided	Gains dependent on funding provided
Indigenous led Kakadu Plum harvesting	\$650,000	400	Unable to predict based on current data	Unable to predict based on current data

Table 3: current and future value and employment figures for possible transitional industries





## Conclusion

The recent exposé into the Australian commercial crocodile industry has exposed the lies of the industry in regards to their high welfare standards for the animals.

Further research shows that their claims of conservation are equally false, with wild crocodile numbers much more dependent on the legislated ban on hunting, and community education programs, than the existence of a commercial farming industry.

This report indicates that likewise, the claims industry makes regarding the economic and employment benefits to the Northern Territory are equally overstated, with the industry contributing just 0.23% to the Northern Territory GSP, and only 264 jobs. Regarding the benefits specifically touted for remote Indigenous communities, the industry adds \$2.1m and 19 FTE jobs.

This report has highlighted certain industries, either new or existing, that have high future growth potential. Depending on the specifics, if just one or some of these industries are further invested in, the loss of jobs/GSP through a cessation of the commercial crocodile industry in the NT, could be more than accounted for. Providing an exact blueprint for how such a transition may look is outside the scope of this report. However, assuming a transition is in alignment with societal values, in a democratic society it is reasonable to hope that government will use this report as a springboard for continuing to fund a transition out of an industry that exists to turn our native icons into luxury items for the richest 1% of the world.



# References

1. Fukuda Y, Webb G, Manolis C, Delaney R, Letnic M, Lindner G, et al. Recovery of Saltwater Crocodiles Following Unregulated Hunting in Tidal Rivers of the Northern Territory, Australia. *The Journal of Wildlife Management*. 2011;75:1253-66.
2. Britton A. Staying safe in crocodile country: culling isn't the answer. *The Conversation*. 2016.
3. Northern Territory Crocodile Farming Industry - Strategic Plan 2015-2021. Northern Territory Government and Crocodile Farmers Association of the Northern Territory. 2015.
4. Crocodiles. *Agrifutures Australia*. 2017.
5. Economic Value of the Crocodile Farming Industry to the Northern Territory. Ernst & Young. 2017.
6. Clancy TF, Fukuda, Y. NT Saltwater Crocodile (*Crocodylus porosus*) Wildlife Trade. Management Plan: 2018-2019 Monitoring Report and Review. Northern Territory Department of Environment, Parks and Water Security. 2020.
7. Northern Territory Employment. *Remplan Economy*. 2020.
8. Corey B, Webb GJW, Manolis SC, Fordham A, Austin BJ, Fukuda Y, et al. Commercial harvests of saltwater crocodile *Crocodylus porosus* eggs by Indigenous people in northern Australia: lessons for long-term viability and management. *Oryx*. Cambridge University Press; 2018;52(4):697-708.
9. Fitzgerald D. Crocodile king Mick Burns and French fashion label Hermès snap up NT melon property for croc farming. *ABC Rural*. 2010.
10. Langworthy A, Bourne G, Frearson L, Howard K, McKenzie A, Peake O. Northern Territory Roadmap to Renewables. 2017.
11. The 10 Gigawatt Vision: How renewable energy can power jobs and investment in the Northern Territory. *Beyond Zero Emissions*. 2019.
12. Employment in Renewable Energy Activities. Australian Bureau of Statistics. 2020.
13. Fitzgerald D. Vegan and vegetarian markets targeted by mango grower Manbulloo in Northern Territory jackfruit trial. *ABC Rural*. 2020.
14. Best A. Value-adding options for tropical fruit using jackfruit as a case study. *Rural Industries Research and Development Corporation*. 2015;15/042.
15. Hall M. Jackfruit, do you want fries with that? *LinkedIn*. 2019.
16. New Opportunities in New and Emerging Agricultural Industries in Australia. *Coriolis*. 2017.
17. Taro. *Agrifutures Australia*. 2017.
18. Fanning K, Diczbalis Y. Collation of health literature for tropical exotic fruits and extracts. *Rural Industries Research and Development Corporation*. 2013;13/014.
19. Ash A, Gleeson T, Hall M, Higgins A, Hopwood G, MacLeod N, et al. Irrigated agricultural development in northern Australia: Value-chain challenges and opportunities. *Agricultural Systems*. 2017;155:116-25.
20. Economic Profile of Plant Based Industries in the Northern Territory. *NT Farmers*. 2015.
21. Stephens M, Woods T, Brandt C, Bristow M, Annandale M. Northern forestry and forest products industry situational analysis. *Cooperative Research Centre for Developing Northern Australia*. 2020.
22. Yan M. Life cycle assessment of Fruit leather. *Wageningen University & Research*. 2017
23. Hickey S. Wearable pineapple fibres could prove sustainable alternative to leather. *The Guardian*. 2014.
24. Kateman B. The Time Is Ripe For Ugly Fruits And Vegetables. *Forbes*. 2020.
25. Global Synthetic Leather Market (2020 to 2025) - Focus on Development of Bio-Based Synthetic Leather Presents Opportunities. *Research and Markets*. 2021.
26. Bio Based Leather Market. *Persistence Market Research*.
27. NT's Tourism Industry Strategy 2030. *Tourism NT*. 2019.
28. Tourism Vision 2020: Northern Territory's Strategy for Growth. *Tourism NT*. 2013.
29. Our North, Our Future: White Paper on Developing Northern Australia. *Australian Government*. 2015.
30. Esposito EM, Palumbo D, Lucidi P. Traveling in a Fragile World: The Value of Ecotourism. *Problematic Wildlife II: New Conservation and Management Challenges in the Human-Wildlife Interactions*. 2020;273-355.
31. Sangha KK, Duvert A, Archer R, Russell-Smith J. Unrealised economic opportunities in remote Indigenous communities: Case studies from northern Australia. *Social Sciences & Humanities Open*. 2020;2(1):100093.
32. Potential for the Carbon Market to Contribute to Economic Recovery of the Northern Territory. *Indigenous Carbon Industry Network*. 2020.
33. Ansell J, Evans J, Adjumarllarl R, Arafura Swamp R, Djelk R, Jawoyn R, et al. Contemporary Aboriginal savanna burning projects in Arnhem Land: a regional description and analysis of the fire management aspirations of Traditional Owners. *International Journal of Wildland Fire*. 2020;29(5):371-85.



34. Increased powers for Aboriginal rangers to manage traditional lands. Department of Tourism and Culture. 2017.
35. Gorman J, Pearson D, Wurm P. Old Ways, New Ways—Scaling Up from Customary Use of Plant Products to Commercial Harvest Taking a Multifunctional, Landscape Approach. *Land*. 2020;9(5).
36. Case Study: Kakadu Plum, Northern Territory, Western Australia. Indigenous Land and Sea Corporation Annual Report 2018–19.
37. Gorman, J. T., Wurm, P. A. S., Vemuri, S., Brady, C., & Sultanbawa, Y. Kakadu Plum (*Terminalia ferdinandiana*) as a Sustainable Indigenous Agribusiness. *Economic Botany*. 2020;74:74-91.
38. Garrick M. Kakadu plum plan aims to take a bite out of lucrative global medicine industry. ABC News. 2018.
39. Management Program for *Terminalia ferdinandiana* in the Northern Territory of Australia 2018-2022. Northern Territory Department of Environment and Natural Resources. 2018.