

Developing the Aquaculture Industry in Northern Australia

Introduction

- 4.1 The Northern Territory Department of Primary Industry and Fisheries (NTDPIF) lists the key advantages for large-scale aquaculture production in the Northern Territory (NT) as:
- Largely undeveloped coastline with minimal competition by other users, such as industries, urban coastal growth and recreational users of the coastline and seas.
 - Pristine waters offering clean and green product branding.
 - Proximity to Asia, with its rapidly growing wealthy middle class.
 - Higher average seawater temperatures offering substantial production cost savings through significantly reduced production times. ...
 - Broad support and engagement by Aboriginal and Torres Strait Islander coastal communities for fisheries-based economic development and employment opportunities.¹
- 4.2 The Pearl Producers Association (PPA) added to this list, noting that:
- Many of the Northern Australian waterways are sheltered and punctuated with islands and inlets suitable for aquaculture operations.
 - ... The waters are also characterised by mega-tidal fluctuations [which] mean that carrying capacity is high and likelihood of reduction of ecosystem structure and function is low.

¹ Northern Territory Department of Primary Industry and Fisheries (NTDPIF), *Submission 13*, p. 3.

- There are a large number of native/endemic species that have the capacity to be developed in an aquaculture context.²
- 4.3 Despite these advantages Northern Australia, unlike South Australia and Tasmania, has been slow to develop its aquaculture potential.³

Financing and Other Industry Assistance

Business Challenges in Northern Australia

- 4.4 The Finfish Group (Finfish) identified several challenges facing businesses operating and expanding in Northern Australia, including:
- Significant construction costs of infrastructure
 - Insufficient regional support services
 - Very high electricity costs
 - High freight costs due to significant trucking distances ...⁴

- 4.5 Charles Darwin University (CDU) described how increases in power costs caused a major barramundi farm to be closed. The CDU identified transport and labour costs as two other factors:

The logistics of bringing food up here is another one – you have to double your price pretty much. We all know food is probably 30 per cent of your costs, and the other cost is labour.⁵

- 4.6 The BMT Oceanica commented that the start-up costs could ‘be prohibitive’ which may deter potential new entrants.⁶ Finfish, which took over a Queensland Government facility, emphasised the importance of intellectual property and aquaculture brood stock:

The [intellectual property] certainly rests with the people, the excellent team that we have at the breeding facility, but the brood stock is a very valuable component of the work ... without that, obviously, the guys have nothing to work with. That takes a long time to acquire and it is one of the significant barriers to entry for anyone else entering the system ...⁷

2 Pearl Producers Association (PPA), *Submission 26*, p. 4.

3 PPA, *Submission 26*, p. 7.

4 The Finfish Group (Finfish), *Submission 35*, p. 7.

5 Mr Chadd Mumme, Horticulture and Aquaculture for Primary Industries, Charles Darwin University (CDU), *Official Committee Hansard*, Darwin 14 July 2015, p. 15.

6 Dr Glenn Shiell, Associate Principal, BMT Oceanica, *Official Committee Hansard*, Perth 11 June 2015, p. 11.

7 Mr Peter Kay, Director, Sustainable Development Corporation, *Official Committee Hansard*, Cairns 24 August 2015, p. 32.

4.7 Clipper Pearls stated that very few companies offered insurance on aquaculture species and that those that did made access to claims ‘very difficult’:

Most insurers offer total or first loss cover only policies, and the deductibles are so large, as too are the premiums, that companies would risk major cash-flow shortages purely to insure their stock below true market value (or well below investment value).⁸

4.8 Humpty Doo Barramundi raised the tax treatment for its operations which only allowed depreciation for its ponds over 20 years and for its sheds over 50 years. Farmed barramundi, which is held for about two years in its ponds before sale:

... is treated as profit, even though it might be 15 or 18 months away from being sold. ... the change in value in stock from one financial year to the next is treated as profit whether we have sold them or not.⁹

4.9 Humpty Doo Barramundi acknowledged that the tax treatment ceased to be a problem once the business stopped growing, but the treatment was ‘putting brakes on growth.’¹⁰

Importance of Financial Investment

4.10 Indian Ocean Fresh Australia (IOFA) stated there was a need to encourage global and domestic investment in Australian aquaculture. There appeared to be an issue with domestic superannuation funds investing in the industry because it was easier to get foreign super funds to invest in Australian agribusiness.¹¹

4.11 The Department of Foreign Affairs and Trade (DFAT) noted that foreign investment can ‘assist in commercialising Australian innovation and opening distribution channels into global markets.’¹² The Seafarms Group (Seafarms) agreed, emphasising the value of linking such investment to ‘supply contracts or off-take agreements.’¹³

4.12 Austrade advised that there had been a ‘very strong uptake and interest from Chinese companies’ following initiatives such as Australia Week in

8 Clipper Pearls, *Submission 20*, p. 2.

9 Mr Robert Richards, Managing Director, Humpty Doo Barramundi, *Official Committee Hansard*, Darwin 14 July 2015, p. 35.

10 Mr Robert Richards, Humpty Doo Barramundi, *Official Committee Hansard*, Darwin 14 July 2015, p. 35.

11 Mrs Erica Starling, Director, Indian Ocean Fresh Australia (IOFA), *Official Committee Hansard*, Perth 11 June 2015, p. 33.

12 Department of Foreign Affairs and Trade (DFAT), *Submission 36*, p. 1.

13 Seafarms Group (Seafarms), *Submission 4*, p. 6.

China.¹⁴ The Australian Prawn Farmers Association (APFA) reported it was receiving:

... at least an inquiry a week over the last couple of months for investors and potential investors through Austrade. Austrade have Japanese investors wanting to come in. Different countries are still wanting to come into Australia because they can see our clean, green potential and the ability to provide food to feed their own people.¹⁵

- 4.13 Seafarms agreed that overseas people were 'very keen to be involved' in aquaculture developments in Australia, but international investors needed the approvals in place before they saw projects as 'investable'.¹⁶

Ability to Attract Capital

- 4.14 The Queensland Crayfish Farmers Association (QCFA) stated that the biggest impediment to expanding the red claw crayfish industry was overcoming the reputation previously gained by the sector. There had been ill-advised and underfinanced unsuccessful farms and the industry was seen as a poor investment by financial institutions.¹⁷
- 4.15 Humpty Doo Barramundi also noted the reluctance of banks to lend to new enterprises because such a company did not have the collateral, unless the bank was prepared to consider the aquaculture farm itself as having collateral value.¹⁸
- 4.16 The Western Australia Department of Fisheries (WADF) stated that economies of scale were needed to attract investors to aquaculture projects in the Kimberley Region:

Given the high-cost environment prevailing in the region, and across Northern WA generally, a large production level is required to provide an economy of scale that warrants the level of investment needed for such operations.¹⁹

- 4.17 Maxima Opportunity supported this view.²⁰

14 Ms Jane Madden, General Manager, Austrade, *Official Committee Hansard*, Canberra 15 September 2015, p. 12.

15 Ms Helen Jenkins, Executive Officer, Australian Prawn Farmers Association (APFA), *Official Committee Hansard*, Brisbane 27 August 2015, p. 14.

16 Dr Chris Mitchell, Executive Director, Seafarms, *Official Committee Hansard*, Brisbane 27 August 2015, p. 18.

17 Queensland Crayfish Farmers Association (QCFA), *Submission 1.1*, p. 1.

18 Mr Robert Richards, Humpty Doo Barramundi, *Official Committee Hansard*, Darwin 14 July 2015, p. 35.

19 Western Australia Department of Fisheries (WADF), *Submission 23*, p. 2.

20 Maxima Opportunity, *Submission 22*, p. 4.

- 4.18 Marine Projects Australia (MPA), which recently had its barramundi production licence increased to 7000 tonnes, said that production even at this volume was insufficient to attract international investment:

With 7000 tonnes, when we look at Norwegian investors and Chinese investors they say: 'You're way too small. We're not coming in.'²¹

- 4.19 Tropical Aquaculture Australia (TAA) provided a similar example in the NT. The TAA was seeking funds to establish a trepang hatchery in Arnhem Land:

We need \$6 million over the first three years, and we will be producing by the end of year three. The trouble is that, for the venture capitalists, it is just too small. The venture capitalists say, 'Get it up to \$15 million or \$20 million and it is worth us doing it – you're too small.'²²

- 4.20 The Commonwealth Scientific and Industrial Research Organisation (CSIRO) suggested that potential investors faced a 'Catch-22' because they did not have the required regulatory certainty to invest in new aquaculture development projects and the lack of projects meant that regulatory requirements had yet to be developed.²³

- 4.21 Mainstream Aquaculture considered the barramundi industry had an opportunity to become 'a very significant industry', but needed to consolidate:

... to raise institutional capital, because aquaculture is a capital-intensive business. We are probably 20 years behind the salmon industry in our development, but I think we have the attributes in place now: we have the breeding program in place, we have a number of very competent operators and we have a very significant market opportunity that we can operate within.²⁴

Government Support

- 4.22 The Aquaculture Council of Western Australia (ACWA) reported the view of some of its members that there continued to be a 'lack of incentive

21 Dr Desiree Allen, Managing Director, Marine Produce Australia (MPA), *Official Committee Hansard*, Perth 11 June 2015, p. 51.

22 Mr Philip Elsegood, Director, Tropical Aquaculture Australia (TAA), *Official Committee Hansard*, Darwin 14 July 2015, p. 48.

23 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission 17*, p. 3.

24 Mr Boris Musa, Managing Director, Mainstream Agriculture, *Official Committee Hansard*, Townsville 26 August 2015, p. 38.

provided by government' to overcome the challenges of operating in remote north WA:

Incentives for new industry are very important and without them the burden falls fully onto the operators, who are already having to deal with significant risk and uncertainty inherent in an aquaculture operation.²⁵

4.23 Finfish also advocated a greater role for government in supporting businesses which were based on innovation,²⁶ and IOFA considered that government had a role in de-risking projects at the early stage 'in order to encourage commercial investment.'²⁷

4.24 The ACWA stated that hatcheries were very important for aquaculture, but it was difficult for one entity to establish a hatchery. Also, hatcheries were not needed all year round.²⁸ The ACWA called for government support to set up a multi-species hatchery in the northern area:

It is just spreading that risk. It is not an inexpensive thing to build a hatchery and there are obviously inherent risks in the first two to three years. That is probably where the government support might come in because if there was a failure for one particular batch and it was solely based around barramundi, that particular hatchery could go under.²⁹

4.25 The QCFA also called for government support through provision of concessional loans 'to companies or individuals having a genuine desire to enter' the freshwater crayfish aquaculture sector.³⁰

4.26 Seafarms, which is seeking to establish Project Sea Dragon, a 100 000 tonnes prawn farming operation in Northern Australia, stated that the investment needed was ultimately \$1.45 billion which included a 'substantial amount of up-front infrastructure investment.' Seafarms was 'talking to the government about the concessional loan scheme.'³¹

4.27 The WADF highlighted Project Sea Dragon which included a hatchery, grow out ponds, feed mill, processing plant, and export facilities as

25 Aquaculture Council of Western Australia (ACWA), *Submission 8*, p. 5.

26 Mr Peter Halley, Director, Sustainable Development Corporation, *Official Committee Hansard*, Cairns 24 August 2015, p. 29.

27 Mrs Erica Starling, IOFA, *Official Committee Hansard*, Perth 11 June 2015, p. 31.

28 Ms Tina Thorne, Executive Officer, ACWA, *Official Committee Hansard*, Perth 11 June 2015, p. 15.

29 Mr Stephen Davies, Vice-Chairman, ACWA, *Official Committee Hansard*, Perth 11 June 2015, p. 16.

30 QCFA, *Submission 1.1*, p. 3.

31 Dr Chris Mitchell, Seafarms, *Official Committee Hansard*, Brisbane 27 August 2015, p. 18.

indicating 'the scale and level of integration needed for successful commercial aquaculture'. The WADF added:

To improve the commercial viability of developing large-scale aquaculture projects in Northern WA, the State or Federal government could assist through the approval of grants or subsidy schemes. These schemes could include providing short-term assistance for the establishment of the industry or through continuing assistance in the form of tax relief ...³²

4.28 The NTDPIF did not support governments actively seeking to attract projects, but instead suggested they wait for an approach from business:

... the types of investors we tend to attract by actively touting government support are those that are likely marginal at best ... Governments are not necessarily very good at picking winners in this regard. Instead, I believe it is better to make sure the approvals and government support processes are in place so that when a serious investor comes knocking they can be offered appropriate support and assistance.³³

Strategic Leadership

Industry

4.29 IOFA provided a model for industry-led developments:

You need to look for an industry leader to champion any project. If industry is not leading the way on something and seeking to improve or adopt new technology, is it something that the government should be funding? ...

The government can ensure commercialisation pathways are sound in terms of IP protection and IP-sharing arrangements. ...

... you need industry having significant investment in the project, and government needs to provide solid governance to provide comfort and accountability to the community at large and to taxpayers.³⁴

... government should consider programs where industry actually make the application for the infrastructure and bring the government parties along with them.³⁵

32 WADF, *Submission 23*, p. 3.

33 Mr Glenn Schipp, Director, Fisheries and Aquaculture, NTDPIF, *Official Committee Hansard*, Darwin 14 July 2015, p. 1.

34 Ms Erica Starling, IOFA, *Official Committee Hansard*, Perth 11 June 2015, p. 31.

35 Ms Erica Starling, IOFA, *Official Committee Hansard*, Perth 11 June 2015, p. 34.

Government

- 4.30 The DFAT stated that, at the Federal level, there is a 'proactive international investment attraction campaign' to provide information about Northern Australia's investment potential. The campaign centres on a Northern Australia Investment Forum held in November 2015 and 'hosted by Austrade in collaboration with the Northern Territory, Queensland and Western Australian governments.'³⁶
- 4.31 Further, the Department of Agriculture (DoA) commented that it was leading the development of a national aquaculture strategy and 'undertaking consultations with industry players, the states and anyone else who wishes to make a submission or talk to us.' The strategy would be completed either by late 2015 or early 2016.³⁷
- 4.32 At the State level, WADF stated that the WA Government:
 ... has provided \$1.85 million for the development of investment-ready aquaculture zones in the Kimberley and Mid-West regions; it has also committed funds for finfish aquaculture pilot projects and for suitable aquaculture enterprises to seek third-party sustainability assessment.³⁸
- 4.33 The Australian Institute of Marine Science (AIMS) commented that the current approval process overwhelms many proposed aquaculture ventures at an early stage. The AIMS suggested that there be formed a 'high-level, public-private task force to take concepts for aquaculture in Northern Australia through to compelling proposals.'³⁹

Skills and Training

- 4.34 There are two large-scale aquaculture training programs in Australia: at the James Cook University (JCU): which focuses on tropical species; and at the University of Tasmania which focuses on temperate species, including salmon.⁴⁰ At JCU there are courses at the undergraduate and postgraduate levels.⁴¹
- 4.35 Charles Darwin University (CDU) stated that since the early 1990s it has been teaching and training in the field of aquaculture and had trained

36 DFAT, *Submission 36*, p. 1.

37 Mr Ian Thompson, First Assistant Secretary, Department of Agriculture (DoA), *Official Committee Hansard*, Canberra 15 September 2015, p. 1.

38 WADF, *Submission 23*, p. 1.

39 Australian Institute of Marine Science (AIMS), *Submission 31*, p. 5.

40 Prof. Dean Jerry, Head of Aquaculture and Fisheries, James Cook University (JCU), *Official Committee Hansard*, Townsville 26 August 2015, p. 11.

41 JCU, <https://www.jcu.edu.au/search?query=aquaculture&collection=jcua-courses> Accessed 4 November 2015.

- aquaculture technicians and farm hands for local and interstate demands.⁴² In 2015, the CDU offered aquaculture courses at the certificate level.⁴³ The CDU was also developing an aquaculture training program to assist traditional owners in their aquaculture enterprises.⁴⁴
- 4.36 The CDU added that training qualifications were 'quite flexible' and could be amended to meet industry needs. The CDU could 'put on extra qualifications or [could] change the units' that were offered.⁴⁵ Graduating aquaculture students from CDU went to South Australia or Tasmania.⁴⁶
- 4.37 The Kimberley Training Institute (KTI) offers courses in aquaculture at the certificate and diploma levels.⁴⁷ The KTI has also introduced training in aquaponics for which a 'reasonably large number of clients' were interested.⁴⁸
- 4.38 The KTI commented that 'direct employment in aquaculture, particularly in the north-west, has been very low.' Unfortunately, people who were interested in employment in aquaculture industry went elsewhere, to Queensland or to Tasmania.⁴⁹ KTI added that there were multiple streams that arose from its training and which enabled people to enter marine science support pathways such as marine park planning, marine park rangers, fisheries, and fisheries officers.⁵⁰
- 4.39 The Australian Barramundi Farmers Association (ABFA) stated that most regional and remote areas have skills and labour shortages, including technical and operational staff, which was 'critical to sustainable and profitable aquaculture ventures.'⁵¹
- 4.40 The MPA considered the shortage of available local staff and the need to hire from outside the local area, as well as a skills shortage, was a

42 CDU, *Submission 34*, p. 1.

43 CDU, <http://stapps.cdu.edu.au/f?p=100:30:4415838718815279::NO> Accessed 4 November 2015.

44 CDU, *Submission 34*, p. 2.

45 Mrs Michelle Lewis, School of Primary Industries, Charles Darwin University (CDU), *Official Committee Hansard*, Darwin 14 July 2015, p. 18.

46 Mr Chadd Mumme, CDU, *Official Committee Hansard*, Darwin 14 July 2015, p. 12.

47 Kimberley Training Institute (KTI), <http://kti.wa.edu.au/courses/search/?StudyOptions=&CampusLocations=&IsShortCourse=&Term=aquaculture&CourseCategory=&pageNumber=1&itemsPerPage=21> Accessed 4 November 2015.

48 Mr Jeffrey Cooper, Portfolio Manager, KTI, *Official Committee Hansard*, Broome 10 June 2015, p. 2.

49 Mr Jeffrey Cooper, KTI, *Official Committee Hansard*, Broome 10 June 2015, p. 2.

50 Mr Jeffrey Cooper, KTI, *Official Committee Hansard*, Broome 10 June 2015, p. 4.

51 Australian Barramundi Farmers Association (ABFA), *Submission 3*, p. 2.

contributing factor affecting development of the aquaculture industry in Northern Australia.⁵²

- 4.41 The PPA also commented that there was a lack of incentive for workers to undertake aquaculture training, and this included a lack of training opportunities for local Aboriginal and Torres Strait Islander people. Consequently, there was a ‘heavy reliance on overseas workers, to meet skills shortages.’⁵³
- 4.42 The IOFA suggested that training providers should align their services to industry needs and added that aquaculture students were being trained in WA ‘for no jobs, and the skills that they are learning are totally irrelevant to what we actually need as an industry.’⁵⁴
- 4.43 The JCU stated that skill shortages were not unique to Australia and there was ‘a global shortage of well-trained tropical aquaculture workers’. There was also a ‘worldwide shortage of veterinarians who have been suitably trained to diagnose and treat disease in tropical aquaculture animals.’
Responding to industry demand:

JCU [was] in the process of modifying its aquaculture curricula to incorporate more hands-on, industry-embedded training as well as to deliver short training courses so that the developing aquaculture industry doesn’t face a skills shortage in the near future.⁵⁵

- 4.44 Seafarms indicated that Project Sea Dragon would require a ‘very significant training task’ and it was having ‘early discussions with training providers’:

One of the interesting things about aquaculture in this proposal is that the variety of jobs is much greater and more surprising than people imagine. At the less skilled end, you have people working on farms who might be just cleaning screens – really farm labourers. ... At the top end, we will employ geneticists, veterinarians et cetera – people with PhDs and postgraduate qualifications – and everything in between.⁵⁶

Educational Exports

- 4.45 The JCU identified opportunities for up-skilling overseas aquaculture staff, particularly from China:

52 MPA, *Submission 18*, p. 1.

53 PPA, *Submission 26*, p. 8.

54 Mrs Erica Starling, IOFA, *Official Committee Hansard*, Perth 11 June 2015, p. 32.

55 JCU, *Submission 14, Attachment A*, p. 4.

56 Dr Chris Mitchell, Seafarms, *Official Committee Hansard*, Brisbane 27 August 2015, p. 17.

From a knowledge economy perspective, there is significant demand for edu-tourism opportunities in aquaculture from Asian investment brokers keen to facilitate access for Asian university students to high-quality Australian short-course training in aquaculture.⁵⁷

4.46 The KTI also saw opportunities for training international students. The KTI stated that about 5 to 10 percent of its vocational training students were from overseas and added:

They typically take the training, go back to their country and establish multimillion dollar businesses, so they obviously learn a lot.⁵⁸

Aboriginal and Torres Strait Islander Community Involvement

4.47 The AIMS observed that 'sea country' was 'an important aspect of [Aboriginal and Torres Strait Islander] culture' and that [Aboriginal and Torres Strait Islander] people have an interest in opportunities and impacts affecting sea country. The AIMS continued, noting that 'successful and sustainable [Aboriginal and Torres Strait Islander] operations have to date proved difficult to achieve.' This was due to many factors, including poor project design and a 'failure to engage effectively with the local community in which they were established.' The AIMS recommended that, before a project was considered for an Aboriginal and Torres Strait Islander community, there should be the standard business case and rigorous adherence to a series of prerequisites:

- The community has been engaged and want the project.
- Elders from the community are involved or informed, and scientists/extension officers implementing a project will spend time in the community, not just fly in and out.
- Strong and effective local leadership will be established to take charge of the project.
- The project/farm species is suitable for the local conditions and community lifestyle ...
- If the preceding conditions are met and a project initiated, the community is involved from the outset, collecting data, setting up experiments, and having experience of all stages, so that if it

57 JCU, *Submission 14 Attachment A*, p. 4.

58 Mr Jeffrey Cooper, KTI, *Official Committee Hansard*, Broome 10 June 2015, p. 2.

succeeds they know how to do it ... and they have ownership of the project.⁵⁹

- 4.48 The DoA stated that Aboriginal and Torres Strait Islander communities had expressed ‘a strong interest in participating in aquaculture.’ The Federal Government was engaged with:

... [Aboriginal and Torres Strait Islander] communities and groups through the Indigenous Reference Group of the Fisheries Research and Development Corporation (FRDC) which focuses on research and development to assist Aboriginal and Torres Strait Islander people derive greater benefits through fishing, both traditional and commercial.⁶⁰

- 4.49 The WADF, while acknowledging that native title could potentially constrain access to land tenure, commented that partnerships with traditional owners could ‘reduce the risk of native title, support project development and support the well-being of the local [Aboriginal and Torres Strait Islander] community’.⁶¹

- 4.50 The Pew Charitable Trusts (Pew) supported aquaculture as a way to broaden Aboriginal and Torres Strait Islander community development beyond the ranger programs:

... there needs to be other industries, and people are branching into things like tourism. ... tourism and rangers are not necessarily going to be enough for communities. That is part of the reason that we are supportive of aquaculture as a possible industry because, done rightly, it can be quite a low-impact and positive industry and one that [Aboriginal and Torres Strait Islander] people would probably want to work in.⁶²

- 4.51 The NTDPIF stated that its Aboriginal and Torres Strait Islander aquaculture programs had ‘established small foundational fisheries and aquaculture programs’ which had the potential to become commercial Aboriginal and Torres Strait Islander fisheries ventures. The department was seeking investment for developing Aboriginal and Torres Strait Islander micro-fisheries ‘to provide seafood into local markets thus improving local food security and nutrition, employment and business capacity development.’⁶³

59 AIMS, *Submission 31*, p. 3.

60 DoA, *Submission 11*, p. 6.

61 WADF, *Submission 23*, p. 5.

62 Mr Tim Nicol, Kimberley Manager, Pew Charitable Trusts (Pew), *Committee Hansard*, Perth 11 June 2015, pp 25–26.

63 NTDPIF, *Submission 13*, p. 5, 6.

- 4.52 Cygnet Bay Pearls observed that traditional owners were 'capable of engaging with business and creating opportunities.'⁶⁴ The local Bardi-Jawi traditional owners had provided written agreement for feasibility research into developing an edible rock oyster industry in the Kimberley. This would result in commercial opportunities for the traditional owners and significant employment.⁶⁵
- 4.53 Tasmanian Seafoods reported that it had cooperated with the Aboriginal Land Council on Groote Eylandt to develop a trepang ranching enterprise:
... trial stocking of juveniles included the community of Umbakumba in the process of assessing wild populations, monitoring seeded juveniles, the presence of crocodiles and the harvesting and initial processing of the product. ... the harvesters were trained and were happily engaged in the project and finally paid with the community benefiting from the harvests.⁶⁶
- 4.54 Crocodile farming in the NT is based on egg collection from wild crocodiles living on Aboriginal and Torres Strait Islander land. Porosus described how farming was changing with increasing commercial involvement of Aboriginal and Torres Strait Islander people:
... they collect the eggs themselves, they incubate them, they hatch and they grow them. My best estimate is that by the end of the year [the crocodiles] will be about 80 centimetres or around that mark. They are getting \$200 an animal instead of \$25 for an egg. It is working really well. ...
We guarantee that all healthy crocs are bought at \$2 or \$2.50 a centimetre. ...
Baby crocs do not eat a lot, of course. But it is basically cleaning, feeding and grading. So it is about a work culture. It is developing a work ethic. It is building up the capacities.⁶⁷
- 4.55 The Ranger group supplying Porosus used the income to buy ranger equipment. Porosus stated that after the first year, the mortality rate of the crocodiles had dropped to 'probably sub-six [per cent], which any farm would be happy with, let alone a remote community.'⁶⁸ An additional

64 Mr James Brown, Cygnet Bay Pearls, *Official Committee Hansard*, Broome 9 June 2015, p. 11.

65 Cygnet Bay Pearls, *Submission 27*, p. 14.

66 Tasmanian Seafoods, *Submission 16*, p. 2.

67 Mr Michael Burns, Managing Director, Porosus, *Official Committee Hansard*, Darwin 14 July 2015, pp 37, 38.

68 Mr Michael Burns, Porosus, *Official Committee Hansard*, Darwin 14 July 2015, p. 38.

benefit was that nutrient rich waste water from the crocodile pens could be used to grow vegetables.⁶⁹

- 4.56 Porosus predicted that in 10 years ‘there would be eight or 10 regional satellite crocodile farms on Aboriginal communities’ supplying the main grow-out farms which were ‘very demanding on feed and labour.’⁷⁰

Research

- 4.57 The AIMS stated that Australia had ‘the potential research base through its universities and publicly funded research agencies ... to support the expansion of aquaculture in Australia’s northern regions.’ The AIMS added:

However, on the whole, the scale and resourcing of Australia’s research efforts lags well behind that of other countries (e.g. Denmark, Norway, Canada, Chile and Israel, and increasingly Asian countries, such as Japan and Korea) ... Many of these nations have leading research institutes devoted exclusively to aquaculture.⁷¹

- 4.58 Maxima Opportunity stated that research and development in Australia’s relatively young aquaculture industry, such as barramundi, would ‘provide far greater productivity gains [per dollar spent] than investment in more mature industries where many of the efficiency gains from selective breeding have already been realised.’⁷²

- 4.59 The Aquaculture Association of Queensland (AAQ) commented that ‘new industries and technologies have substantial lead times from an initial concept to full development’ and required ‘deep pockets and a long-term commitment far greater than the election and budget cycles.’ The AAQ provided the example of the silver perch industry which had received research support for the 1990s and into the early 2000s. Support subsequently declined and currently there is no research in Australia.⁷³

69 Mr Michael Burns, Porosus, *Official Committee Hansard*, Darwin 14 July 2015, p. 39.

70 Mr Michael Burns, Porosus, *Official Committee Hansard*, Darwin 14 July 2015, pp 37, 39.

71 AIMS, *Submission 31*, p. 4.

72 Maxima Opportunity, *Submission 22*, p. 4.

73 Mr Robert Bartley, President, Aquaculture Association of Queensland (AAQ), *Official Committee Hansard*, Brisbane 27 August 2015, p. 9.

- 4.60 The APFA stated that its association funded research through a compulsory levy, but that small industries would find it difficult to fund research.⁷⁴

Areas for Research

Genetic Improvement

- 4.61 Improved genetics can deliver more robust stock which can be harvested more easily, a faster growing rate, and better feed conversion rates.⁷⁵ The CSIRO stated that 'breed and feed technologies have demonstrated tripling of production of seafood protein by area'.⁷⁶
- 4.62 The DoA observed, on the other hand, that there were 'limited opportunities for the application of domesticated lines of tiger prawns and banana prawns in Northern Australia due to the small number of farms.' For barramundi, selective breeding for improved growth under commercial conditions has been limited by the small scale of the industry.⁷⁷
- 4.63 Clipper Pearls advised that it had invested over \$3 million into the genetic improvement of pearl oysters and has had the opportunity to commercialise this research.⁷⁸
- 4.64 Project Sea Dragon aimed to use wild caught tiger prawns to form the basis of a domesticated population. These prawns would be selectively bred at a hatchery near Darwin before being moved to a brood stock maturation centre. Prawn offspring would then be transferred to grow-out ponds and later harvested for market.⁷⁹
- 4.65 The ACWA commented that a long time was needed to domesticate a marine finfish 'to the stage where it will actually produce and have the right feed conversion ratio to produce in the time frame' needed to be economical.⁸⁰ The MPA described this process for barramundi:

... a breeding program takes a lot of work, a lot of money and it really probably needs to be a commercial enterprise. ...

You need a lot of animals. Barramundi are males for the first two years of their lives and then they become female. So, in order to

74 Ms Helen Jenkins, APFA, *Official Committee Hansard*, Brisbane 27 August 2015, p. 10.

75 ABFA, *Submission 3*, p. 2; Seafarms, *Submission 4*, p. 4.

76 CSIRO, *Submission 17*, p. 3.

77 DoA, *Submission 11*, p. 3.

78 Mr Patrick Moase, General Manager, Clipper Pearls, *Official Committee Hansard*, Broome 9 June, p. 14.

79 Dr Chris Mitchell, *Official Committee Hansard*, Brisbane 27 August 2015, pp 16-17.

80 Ms Tina Thorne, ACWA, *Official Committee Hansard*, Perth 11 June 2015, p. 20.

stop genetic inbreeding as you go through the next 30 years of your breeding program, you have to start with a lot of animals, which requires a lot of space, and a lot of copies of those animals. You have to continually have males coming in, because two years later they are females, so you need new stock.⁸¹

- 4.66 The MPA added that in permanent single sex animals such as kingfish, selective breeding was easier:

... kingfish are born male and female, so you can start your breeding program and keep those animals throughout the entirety of their life as breed stock, whereas [with barramundi] if you have a great male, two years later he becomes a great female ...⁸²

Feed Technology

- 4.67 Pew Charitable Trusts advocated for research into high quality feedstocks because this would prevent reliance on increased fishing effort for feedstock or increase the value of by-catch from existing fisheries.⁸³

- 4.68 The CDU stated that certain pilchard mackerel species provided the source of protein and oil in feedstock. There was a limit to the amount of vegetable matter which could be used:

They do get a bit of protein sourced from soy, lupins and all that. They might get three, four or five per cent of the protein, but you still have to get at least 40 per cent protein for your feed [from fish sources] because these are carnivore fish. As soon as [vegetable protein] went up over a few different levels, the fish were just dying ...⁸⁴

- 4.69 The KTI observed that fish which were fed meal with a high lupin component tasted 'a bit different' from fish which had a high fish meal component.⁸⁵
- 4.70 Humpty Doo Barramundi stated that the goal of fish feed producers globally was to reduce the proportion of fish in the food because they wanted to use the lowest cost combination of inputs without affecting feed

81 Dr Desiree Allen, MPA, *Official Committee Hansard*, Perth 11 June 2015, p. 53.

82 Dr Desiree Allen, MPA, *Official Committee Hansard*, Perth 11 June 2015, p. 54.

83 Pew, *Submission 24*, p. 2.

84 Mr Chadd Mumme, CDU, *Official Committee Hansard*, Darwin 14 July 2015, p. 16.

85 Mr Jeffrey Cooper, KTI, *Official Committee Hansard*, Broome 10 June 2015, p. 8.

performance.⁸⁶ The MPA supported feed companies seeking alternatives for fish oil and fish meal.⁸⁷

4.71 The APFA highlighted CSIRO's Novacq prawn food:

Novacq will revolutionise prawn feeding and globally demand is expected to be enormous as prawn feed has traditionally been based on fish meal which is not sustainable long-term and is more expensive to use.⁸⁸

4.72 Novacq contains aquacultured marine microorganisms instead of fish meal and oil.⁸⁹

Pests and Diseases

4.73 Disease is the biggest risk to aquaculture. The JCU stated that 40 per cent of global aquaculture production is lost to disease.⁹⁰

4.74 Cygnet Bay Pearls called for research into oyster oedema disease which has severely affected the oyster industry in the Kimberley.⁹¹ The disease was discovered in 2006 and had:

... caused the closure of vast farming areas such as Exmouth Gulf, Montebello Islands and most of the Kimberley coast with farming activity migrating from sheltered bay areas to more exposed open sites which display less symptoms of the disease.⁹²

4.75 Cygnet Bay Pearls stated it had found the disease to be almost 100 per cent fatal to juvenile oysters produced in its hatcheries and had sub-lethal effects on the larger oysters used for pearl cultivation. The disease reduced the growth rate of the oyster and the growth and quality of the pearls.⁹³

4.76 Hatchery closures in northern WA meant that hatchery-based research projects designed to enhance stock and pearl quality could not continue, nor could there be an intensive breeding program to produce resilient stock.⁹⁴

86 Mr Bob Richards, Humpty Doo Barramundi, *Official Committee Hansard*, Darwin 14 July 2015, p. 33.

87 Dr Desiree Allen, MPA, *Official Committee Hansard*, Perth 11 June 2015, p. 53.

88 APFA, *Submission 10*, p. 1.

89 Gizmag, *New "fishless" feeds could make aquaculture more sustainable* <http://www.gizmag.com/fishless-fish-feed/28615/> Accessed 8 November 2015.

90 Prof Dean Jerry, JCU, *Official Committee Hansard*, Townsville 26 August 2015, p. 2.

91 Cygnet Bay Pearls, *Submission 27*, p. 12.

92 Cygnet Bay Pearls, *Submission 27*, p. 5.

93 Cygnet Bay Pearls, *Submission 27*, p. 6.

94 Cygnet Bay Pearls, *Submission 27*, p. 11.



Deputy Chair inspecting cultured pearls at the public hearing in Broome

- 4.77 Finfish raised the need for research into viral nervous necrosis which was a ‘huge problem for grouper’ throughout its life. The disease also affected barramundi, but only early in its life span. Finding a treatment or vaccine for the disease was critical to Finfish’s ‘longer term viability.’⁹⁵
- 4.78 The need for access to timely disease and pest diagnosis facilities is discussed below when the Committee reviews the infrastructure required to support aquaculture in Northern Australia.

Seismic Testing

- 4.79 The PPA drew attention to potential conflict between the pearl oyster industry and the energy exploration industry in the Kimberley:
- ... in recent years the whole of the northern bioregion pearling area has been broadly under siege from oil and gas exploration – seismic exploration in particular.⁹⁶ While for the most part it has been located out in deeper water ... In December last year there

95 Dr Richard Knuckey, *Finfish*, *Official Committee Hansard*, Cairns 24 August 2015, p. 31.

96 Seismic surveys use low-frequency, high energy, pulsed sound. AIMS, *Submission 31.1*, p. 3.

was an application by one company to survey the entire Eighty Mile Beach area. ...

Eighty Mile Beach is the last wild pearl oyster fishery of its type in the world, and without it we could not maintain the pearling industry in Australia. ...

... when a seismic array goes over the water column its ecosystem effects are quite substantial. So, compared with its direct effects on shell or animals, which can swim away and might be okay, for things like water particulate, which oysters feed on, and diatoms and what not, in the water, from 500 metres each side of the array this particulate dies and falls out of the water column within 30 minutes or so. This is based on acoustic backscatter analysis.⁹⁷

- 4.80 In 2007, AIMS was part of a consortium of researchers contracted by Woodside Energy to monitor the effects of seismic surveys at Scott Reef. The AIMS stated that prior to that time 'there was limited scientifically robust data concerning the potential impacts of underwater noise from seismic surveys on tropical reef communities, and particularly on site-attached fish.' The survey found that there were 'minimal or no detectable effects.' The AIMS, however, stated that the findings 'may not be directly translatable to the seismic surveys of concern by the pearl industry.'⁹⁸
- 4.81 Pew Charitable Trusts provided a scientific summary on the issue of the impacts of underwater noise prepared by the secretariat of the Agreement on the Conservation of Small Cetaceans in the Baltic, North East Atlantic, Irish and North Seas. This review reported that, while there were adverse effects on the eggs and larvae of marine fish and avoidance behaviour shown by adult fish, the few quantitative studies on marine invertebrates⁹⁹ had produced mixed results. The authors had 'concluded that the lack of robust scientific evidence for the effects of seismic surveys on marine invertebrates meant no clear conclusions could be made.'¹⁰⁰

Research Funding

- 4.82 Finfish observed that it was difficult for the small aquaculture industry in Northern Australia to compete for the limited research funding which was available Australia-wide. The traditional avenue of funding was through

97 Mr Aaron Irving, PPA, *Official Committee Hansard*, Darwin 14 July 2015, p. 20.

98 AIMS, *Submission 31.1*, p. 3.

99 Mainly crustaceans and cephalopods.

100 19th ASCOBANS Advisory Committee Meeting, *CBD Scientific Synthesis on the Impacts of Underwater Noise on Marine and Coastal Biodiversity and Habitats*, http://www.ascobans.org/sites/default/files/document/AC19_4-16_CBD_SBSTTA16_SynthesisUnderwaterNoise_1.pdf p. 49. Accessed 9 November 2015.

cooperative research centres (CRCs), but that funding became thinly spread because once the research topics were announced, ‘everyone from down south will also be interested in trying to support the research topics, so it can end up being too diverted.’¹⁰¹

- 4.83 Finfish added that Fisheries Research and Development Corporation (FRDC) funding was more specific, but the FRDC historically channelled its funding through CRCs. Finfish concluded:

At some time, there may be a call or a need to have a research fund designated for northern research if we really want to bring forward aquaculture in this region. The FRDC has often talked about a northern node – but it has never eventuated – where they can fund projects specific to the region.¹⁰²

- 4.84 GFB Fisheries criticised the Australian Government for spending ‘more money funding research and innovation to assist barramundi farmers in Vietnam over recent years than it has in Australia.’¹⁰³ Cygnet Bay Pearls also criticised research grants being given to companies which operated overseas. Cygnet Bay Pearls provided the example of an Australian pearling company which operated in Indonesia and had research co-funded by JCU:

Their industry leading research has been continuously co-funded by the Australian government in collaboration with [JCU]. Additionally, the Australian centre of excellence for pearl science that has been established at James Cook is largely unavailable to the Australian producers due to confidentiality agreements between the university and its major industry partner. ...
... any Australia government research funding should be focused on research to recover the Australian industry.¹⁰⁴

- 4.85 Since 2004, the JCU has collaborated with Perth-based Atlas South Sea Pearl in three genetic research projects using grants from the ARC Linkage Grant scheme. JCU stated that the three projects had resulted in ‘a significant national benefit to Australia.’ The research had resulted in:
- 19 peer-reviewed scientific articles, with more to be delivered;
 - four PhD and two MSc graduates now working in aquaculture; and
 - ‘DNA pedigree marker suites’ used by the industry to determine the parentage of hatchery offspring.¹⁰⁵

101 Dr Richard Knuckey, Finfish, *Official Committee Hansard*, Cairns 24 August 2015, p. 31.

102 Dr Richard Knuckey, Finfish, *Official Committee Hansard*, Cairns 24 August 2015, p. 31.

103 GFP Fisheries, *Submission 29*, p. 2.

104 Cygnet Bay Pearls, *Submission 27*, p. 12.

4.86 The JCU contrasted this to other pearl research projects:

The outputs and national benefit from the JCU/Atlas collaboration stands in stark contrast to publicly funded grants provided to other pearling companies, where there has been no transparency in terms of the public value realised and no information shared publicly.¹⁰⁶

4.87 Cygnet Bay Pearls recommended the establishment of an Australian Pearling Industry Recovery Research Task Force that could 'focus research funding on projects that will benefit the recovery of the entire industry rather than just individual companies.'¹⁰⁷

4.88 Cygnet Bay Pearls stated that 'one company directly controls enough of the licences to unanimously represent the majority of [the] industry' and suggested that this company would 'only support research projects that benefit their business aspirations rather than the fundamental requirements of a prosperous holistic Australian industry.'¹⁰⁸

4.89 Cygnet Bay Pearls provided as an example, a research proposal submitted to the Fisheries Research and Development Corporation (FRDC) for an investigation into the incidence of oyster oedema disease. The research comprised:

...an environmental monitoring program alongside Cygnet Bay Pearls stock improvement breeding program, with the objective of identifying environmental triggers for the disease.¹⁰⁹

4.90 Cygnet Bay Pearls stated that the application had failed because 'it did not have the 'majority' of industry support.' Cygnet Bay Pearls added that in reality 'it had the entire industry's support except for [one company].'¹¹⁰

4.91 The CSIRO described the process which had occurred when the oyster oedema disease research proposal had been submitted to the FRDC and stated:

It is a two-stage process. First you submit an expression of interest and then, if you are successful, you are invited to develop a full proposal. We were not successful, so we did not get to full proposal stage. ...

There were several points to the feedback that we got. The major one appeared to be that they preferred investigations to be in

105 JCU, *Submission 14.1*, p. 1.

106 JCU, *Submission 14.1*, p. 1.

107 Cygnet Bay Pearls, *Submission 27*, p. 12.

108 Cygnet Bay Pearls, *Submission 27*, p. 11.

109 Cygnet Bay Pearls, *Submission 27*, p. 11.

110 Cygnet Bay Pearls, *Submission 27*, p. 11.

developing a diagnostics to identify the disease. ... There are methods that they have been investing in for some years, about trying to identify diagnostic tools. We felt that the environmental work could go alongside and parallel to complement the work, but that was not supported.¹¹¹

Research Centres

- 4.92 The NTDPIF drew attention to the Darwin Aquaculture Centre which conducted industry-led research and development, and offered business support services. The Centre supported '[Aboriginal and Torres Strait Islander] communities to develop culturally and socially suitable sea farming ventures and businesses that deliver both economic and social benefits.'¹¹²
- 4.93 The AIMS commented that while Northern Australia had the capability and capacity 'to buttress the development of tropical aquaculture', it could be said that 'the efforts are fragmented and uncoordinated.' The AIMS suggested focus would be provided by a Northern Australia Aquaculture Institute:
- ... a partnership of government agencies, research providers and industry. ... if headquartered in Darwin, it could form around NT Fisheries (ie Darwin Aquaculture Centre), AIMS and [CDU], drawing on institutions further afield as required.¹¹³
- 4.94 The AIMS added that such an institute would deliver research expertise and training and could provide outreach to Indonesia and Timor Leste.¹¹⁴
- 4.95 The JCU put forward its case stating that northern Queensland had 'a globally significant community of expertise.' The university was:
- ... recognised internationally as the world's leading institution for coral reef and tropical aquaculture research, home to the [ARC's] Centre of Excellence for Integrated Coral Reef Science ... Industrial Transformation Research Hub for Advanced Prawn Breeding and Genomics, the Centre for Sustainable Tropical Fisheries and Aquaculture and Australia's top rated tourism research.¹¹⁵

111 Dr Matt Vanderklift, Research Group Leader, Oceans and Atmosphere Flagship, CSIRO, *Official Committee Hansard*, Perth 11 June 2015, pp 57-58.

112 NTDPIF, *Submission 13*, p. 3.

113 AIMS, *Submission 31*, p. 4.

114 AIMS, *Submission 31*, p. 4.

115 JCU, *Submission 14 Attachment A*, p. 2.

- 4.96 The JCU stated that the intention of an aquaculture hub was that it would be a shared facility, exploiting 'interactions between industry and R&D providers, not just the university.' Other R&D providers had expressed a strong interest and meetings had been held with Queensland Parliamentary representatives.¹¹⁶ The JCU saw 'Townsville as the global hub for tropical marine sciences, tourism and aquaculture commercialisation, drawing tourists, researchers and industry from around the country and the world.'¹¹⁷
- 4.97 The WADF did not support establishing a research institute in northern WA. The effectiveness of such institutes was determined by 'the long-term commitment of major private and public infrastructure funding and the ability to attract high calibre researchers.' The WADF concluded that 'it would be more appropriate to continue relationships with existing internationally recognised research organisations.'¹¹⁸
- 4.98 The WA Government's Kimberley Conservation and Science Strategy includes the Kimberley Marine Research Project. This project is coordinated by the West Australian Marine Science Institute (WAMSI).¹¹⁹ The WAMSI is an 'unincorporated joint venture' which includes the WADF, the Office of the EPA, WA Department of State Development, CSIRO, AIMS, and the universities in Western Australia.¹²⁰
- 4.99 Cygnet Bay Pearls stated that WAMSI had, through the Kimberley Marine Research Project:
- ... delivered a research network of on-ground participation between every stakeholder ... including the traditional owners, the ranger groups, private enterprise, government agencies and academia ...
- When the WAMSI investment winds up over the next couple of years, that network could easily be utilised ... As far as economic activity in the area, I think that the [network] would attract international funding if it was packaged up right ...¹²¹

116 Prof Rocky de Nys, Professor Aquaculture, JCU, *Official Committee Hansard*, Townsville 26 August 2015, p. 3.

117 JCU, *Submission 14 Attachment A*, p. 2.

118 WADF, *Submission 23*, pp 4-5.

119 Cygnet Bay Pearls, *Submission 27*, p. 4.

120 Dr Ray Masini, Manager Marine Ecosystems Branch, Office of the Environmental Protection Authority, *Committee Hansard*, Perth 11 June 2015, p. 2.

121 Mr James Brown, Cygnet Bay Pearls, *Official Committee Hansard*, Broome 9 June 2015, p. 12.

Reducing Environmental Impacts

- 4.100 Concerns about new aquaculture developments have centred on the environmental impacts of nutrient discharges. These concerns have been largely eliminated by advances in technology.
- 4.101 The AIMS stated that there has been considerable research into the environmental impacts of aquaculture operations, but that only a small number of studies have involved tropical projects. The AIMS suggested that the location of projects could assist with assimilating wastes:
- ... sea-cage culture of finfish in a well-flushed inlet with fringing mangroves would be preferable to an almost land-locked lagoon with sandy shores and a floor of seagrass. Similar considerations apply to siting discharge streams from aquaculture installations on adjoining coastal lands ...¹²²
- 4.102 The AIMS cautioned that secondary effects from contaminants such as anti-foulant chemicals on sea cages and the blanket use of antibiotics 'might be more consequential to the receiving environment than primary waste from excess food and faeces.'¹²³ The AIMS concluded that closed system land-based operations could be sustained if there was a zero discharge requirement, but that the economic penalty was usually too steep.¹²⁴
- 4.103 The MPA, which has a sea cage barramundi farm at Cone Bay, commented that its operation experienced flushing tides of 10-12 metres.¹²⁵ The BMT Oceanica commented that there would, however, always be an impact beneath the sea cage from feeding the fish.¹²⁶
- 4.104 The WA Office of the Environmental Protection Authority (EPA) stated that the Cone Bay operation required environmental monitoring and a management program, a reporting schedule and a set of environmental criteria that needed to be met. The EPA 'would assess compliance and audit the compliance reports.'¹²⁷ When environmental concerns were triggered, responses could include reducing stocking density, reducing feed rates, or moving the sea cages.¹²⁸

122 AIMS, *Submission 31*, p. 2.

123 AIMS, *Submission 31*, p. 3.

124 AIMS, *Submission 31*, p. 3.

125 MPA, *Submission 18*, p. 1.

126 Mr Mark Bailey, BMT Oceanica, *Official Committee Hansard*, Perth 11 June 2015, p. 12.

127 Dr Ray Masini, Manager Marine Ecosystems Branch, Office of the Environmental Protection Authority (EPA), *Official Committee Hansard*, Perth 11 June 2015, p. 4.

128 Dr Ray Masini, EPA, *Official Committee Hansard*, Perth 11 June 2015, p. 7.

- 4.105 The DoA commented that the expansion of the aquaculture industry provided opportunities to commercialise innovations for managing water required to meet legislated requirements.¹²⁹
- 4.106 The JCU provided the example of its algal effluent treatment technology which was used at the prawn farm operated by Pacific Reef. The discharge water from the prawn farm was in fact cleaner than the input water.¹³⁰ JCU stated that this allowed an extra 30 hectares of production.¹³¹



Experimental macroalgae production at James Cook University

- 4.107 Seafarms stated that its Project Sea Dragon was based inland so did not involve mangrove clearing and would use high levels of water recirculation. No antibiotics would be used in its grow out ponds. In fact, the issue was preventing disease entering its production system because the initial brood stock would be sourced from wild prawns and 'there are populations of wild prawns that already carry disease within them and we are aiming to screen those out from the process we use.'¹³²
- 4.108 A closed system is used by Humpty Doo Barramundi:
... we have created artificial wetlands, so the water comes out of our ponds and goes through a snaky kind of a wetland and then

129 DoA, *Submission 11*, p. 3.

130 JCU, *Submission 14, Attachment A*, p. 3.

131 Prof Rocky de Nys, JCU, *Official Committee Hansard*, Townsville 26 August 2015, p. 3.

132 Dr Chris Mitchell, Executive Director, Seafarms Group (Seafarms), *Official Committee Hansard*, Brisbane 27 August 2015, p. 16.

we pump it back into the system again ... We have to do a certain amount of active management of the wetland but it works well.¹³³

4.109 Crocodile farms can also use closed systems. Hartley's Creek Crocodile Farming Company described its closed system:

... very little of our water is discharged. The only time any of our water would be discharged is during flood events ... From the crocodile pens ... [it] goes through an ozone filtration process and then we go through a series of three environmental ponds. Those ponds are all set up at various levels. We have fish and various other natural processes in those ponds, and then it goes through these huge sand filters, which are very wide, and that gradually permeates each level, and you end up with potable water at the end.¹³⁴

Spatial Planning and Baseline Data

4.110 The BMT Oceanica highlighted the challenges faced by proponents developing an environmental impact statement (EIS) in Northern Australia. As well as the increased costs due to distances and logistics, the BMT Oceanica highlighted that northern environments are:

... often poorly studied and the level of work required by a proponent to demonstrate an understanding of their operating environment and potential impacts can be significant.¹³⁵

4.111 Seafarms reported that environmental assessments in tropical regions needed at least one year of studies across the wet-dry climate cycle. Seafarms added that the cost of doing the environmental approvals would be 'millions of dollars' and that 'it only becomes worth putting that risk and capital in play if you have a large enough project'.¹³⁶ The BMT Oceanica supported this view that the environmental science requirements for operating in remote Northern Australia was beyond the budget and capabilities of smaller project proponents.¹³⁷

4.112 Obtaining greater baseline data on environmental and economic conditions for selected regions of Northern Australia could reduce the costs of environmental assessment for project developers and would also

133 Mr Bob Richards, Humpty Doo Barramundi, *Official Committee Hansard*, Darwin 14 July 2015, p. 32.

134 Mrs Angela Freeman, Co-Owner, Hartley's Creek Crocodile Farming Company, *Official Committee Hansard*, Cairns 24 August 2015, p. 9.

135 BMT Oceanica, *Submission 25*, p. 1.

136 Dr Chris Mitchell, Seafarms, *Official Committee Hansard*, Brisbane, 27 August 2015 p. 20.

137 Mr Mark Bailey, Co-Managing Director, BMT Oceanica, *Official Committee Hansard*, Perth, 11 June 2015, p. 9.

be a necessary step in the development of aquaculture zones. The AIMS outlined the role and value of baseline data, stating:

One of the key factors constraining the expansion of the aquaculture industry in Northern Australia is the lack of robust, baseline data on the suitability of areas for aquaculture. This data requirement generally encompasses information such as currents, productivity (at the base of the food web), critical habitats, keystone biota etc, and is important to assessing not just the economic but environmental benefits and risks of location.

... Once a regional assessment is made, it can provide the means for an operator of a proposed aquaculture lease or facility to combine with research providers to estimate carrying capacity or assimilation capacity of the location chosen for the activity.

Nutrient budgeting (especially of nitrogen and phosphorus) and water quality/ecological modelling are particularly important elements in this context in establishing environmental capacity and the sustainability of aquaculture ventures.¹³⁸

- 4.113 The AIMS has worked with CSIRO and Geoscience Australia to test the feasibility of developing baseline data for Northern Australia. The AIMS noted, however, that 'vast expanses [of Northern Australia] remain virtually uncharted in spite of the growing need and demand for such information', but that developing baseline data was potentially costly.¹³⁹ The AIMS suggested that decision makers should identify priority regions to study and that these regions should be simultaneously assessed for multiple industries.^{140,141}
- 4.114 The NTDPIF noted that there was a lack of this information land and water resources in the NT and it had discussed with CSIRO the development of an inventory. Unfortunately, the proposal had not received support within the CSIRO.¹⁴²
- 4.115 The CSIRO stated that a spatial planning framework should include: 'environmental and social values; species; production systems; market demand; and surrounding uses of on-shore, nearshore and offshore regions.'¹⁴³ The CSIRO added that 'the outputs from a spatial planning

138 AIMS, *Submission 31*, pp 1, 2.

139 AIMS, *Submission 31*, p. 2.

140 For example in coastal areas consideration could be given to: fisheries, aquaculture, resource extraction, conservation, ecotourism, Indigenous Protected Areas, ports and navigation.

141 AIMS, *Submission 31*, p. 2.

142 Mr Glenn Schipp, NTDPIF, *Official Committee Hansard*, Darwin, Tuesday 14 July 2015, p. 7.

143 CSIRO, *Submission 17*, p. 5.

framework would provide a rigorous basis for establishing aquaculture zones along the Queensland, NT and WA coast.’¹⁴⁴

Infrastructure

- 4.116 The Committee, in the final report of its previous inquiry, *Pivot North: Inquiry into the Development of Northern Australia* recommended that the Commonwealth Government implement a ‘20 year strategy for the staged development of capital infrastructure in Northern Australia’. This should include the provision of all-year road access to most parts of Northern Australia by road and an increase in the capacity of ports in Northern Australia.¹⁴⁵
- 4.117 The ABFA stated that without the provision of appropriate infrastructure, growth, the aquaculture industry will be limited. Aquaculture’s infrastructure needs include public or multi-user facilities such as all-weather roads, power and water supplies as well as infrastructure aimed specifically at the aquaculture industry such as hatcheries, nursery and feed mills.¹⁴⁶
- 4.118 The ACWA stated that ‘aquaculture does not stand alone as an industry. There is a supply chain that has to support it, so growing the aquaculture industry means growing the supply chain’.¹⁴⁷ This view was supported by Clipper Pearls which stated that:
- ... supply chains are critical to any development of the north ...
When one industry struggles to exist, the domino effect is catastrophic throughout the supply chain – evidenced clearly by the downturn in the mining industry in WA.¹⁴⁸
- 4.119 The KTI suggested that it was necessary to develop hubs of supporting infrastructure accessible to major aquaculture developments such as the Kimberley Aquaculture Development Zone (KADZ) and Project Sea Dragon. The KTI stated that there was little infrastructure to support current and prospective proponents in the KADZ and that infrastructure planning and development needed to be facilitated by government.¹⁴⁹

144 CSIRO, *Submission 17*, p. 5.

145 Joint Select Committee on Northern Australia, *Pivot North: Inquiry into the Development of Northern Australia*, September 2014, Canberra, p. 182.

146 ABFA, *Submission 3*, p.2.

147 ACWA, *Submission 8*, p. 6.

148 Clipper Pearls, *Submission 20*, pp 1-2.

149 Mr Jeffrey Cooper, KTI, *Official Committee Hansard*, Broome, 10 June 2015, p. 5.

Infrastructure Facilitating Distribution

Roads

4.120 Seafarms stated that sealing the road from Kununurra to Legune Station is the key piece of infrastructure required for the development of Project Sea Dragon. Seafarms described the condition of the road:

The road is sealed to within 7.7 kilometres of the [Northern Territory] border. It then goes to a tyre-tearing kind of scoria and then there is a formed dirt road that has two river crossings. It is currently impassable in the wet.¹⁵⁰

4.121 The NTDPIF reported that the NT Government had applied for Commonwealth assistance to upgrade the road to Legune Station to all-weather status. The NTDPIF commented that this road would also service the projected Ord Stage 3 agricultural development.¹⁵¹

4.122 The NTDPIF also nominated the road to Nhulunbuy as a priority piece of transport infrastructure. The NTDPIF stated that even if making a year-round road was not possible that upgrades to the major river crossings along the road would be valuable.¹⁵²

Ports

4.123 The Shire of Derby/West Kimberley reported feedback it had received from aquaculture businesses indicating that there was a critical need for access to reliable port berthing and nearby warehouse facilities. The Shire of Derby/West Kimberly also highlighted the difficulties that start-up aquaculture operators faced in competing with established oil and gas providers for limited portside real estate.¹⁵³

4.124 The MPA stated that the Derby wharf in its current state of development would probably be sufficient for its needs up to a production rate of around 3000 or 4000 tonnes per annum (it currently produces 800 tonnes per annum). The MPA reported that the Shire of Derby/West Kimberley had been very supportive in developing the Derby Wharf to suit MPA's needs but that they 'probably could use some help'.¹⁵⁴ The MPA supported the incremental but long-term development of infrastructure to support the KADZ stating:

150 Dr Chris Mitchell, Seafarms Group, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 21.

151 NTDPIF, *Submission 13*, p. 1.

152 Mr Glenn Schipp, Director, Fisheries and Aquaculture, NTDPIF, *Official Committee Hansard*, Darwin, 14 July 2015, p. 7.

153 Shire of Derby/West Kimberley, *Submission 15*, p. 1.

154 Dr Desiree Allen, MPA, *Official Committee Hansard*, Perth, 11 June 2015, p. 54.

We think of this as an incremental development. It is all well and good to talk about 20 000 tonnes; it is very exciting and everyone gets very enthusiastic, but it is not happening tomorrow. We would like to see government stick with us for the long haul. Two years from now, talk to us again. Four years from now, talk to us again. Help us grow and project realistically. Not have us all say, 'We need all of this stuff right now, quick, quick, quick,' and then have it sit there, unused.¹⁵⁵

- 4.125 If the KADZ is to reach its full production quota of 20 000 tonnes per annum substantial port development will be required. This could take place through expansion of the existing port facilities at Derby or through the development of new port facilities on the Dampier Peninsula. Maxima Opportunity suggested that an infrastructure needs analysis should be undertaken to assess the relative value of potential options. Maxima Opportunity, whilst not discounting Derby as a viable option, stated that the Dampier Peninsula was significantly closer to the KADZ and that from a branding perspective it may not be preferable to using port facilities heavily used for resource exports.¹⁵⁶
- 4.126 Maxima Opportunity also highlighted that at full capacity the KADZ would require movement of 30 000 tonnes of feed into the zone and 20 000 tonnes of fish out of the zone per annum. Maxima Opportunity also suggested that an infrastructure needs analysis was necessary as current infrastructure was unlikely to be able to accommodate these movements.¹⁵⁷

Disease Laboratories

- 4.127 A range of stakeholders were concerned with the lack of aquatic disease diagnosis and management facilities in Northern Australia. The DoA stated that there was only one significant animal health laboratory in Northern Australia (at Berrimah, NT) and further stated that 'effective disease management in aquaculture systems is critically reliant on rapid diagnosis and availability of local specialist knowledge.'¹⁵⁸
- 4.128 The JCU described the decision to close the Queensland Government's disease testing facility at Oonoonba, Townsville as 'crushingly naïve', noting that the majority of the state's agricultural testing had been

155 Dr Desiree Allen, MPA, *Official Committee Hansard*, Perth, 11 June 2015, p. 54.

156 Mr John Hutton, Managing Director, Maxima Opportunity, *Official Committee Hansard*, Perth, 11 June 2015, p. 46.

157 Mr John Hutton, Maxima Opportunity, *Official Committee Hansard*, Perth, 11 June 2015, pp 45-46.

158 DoA, *Submission 11*, p. 5.

conducted from the Oonoonba laboratory. Aquaculture operators were now required to send samples to a laboratory in southern Queensland, but this laboratory was struggling to meet demand for testing resulting in delays. Aquaculture operators would generally aim to limit the spread of a disease by beginning treatment within 24 hours of diagnosis,¹⁵⁹ but under the current arrangements it is commonly taking two weeks to receive the results of testing.¹⁶⁰

- 4.129 The JCU also reported that it had discussed locating a state government owned biosecurity facility on the JCU campus with the Queensland Government. The JCU had spent several million dollars preparing a site, but the facility had been cancelled. The site was still available, building a facility to replace the functions of the Oonoonba laboratory would cost in the vicinity of \$20 million.¹⁶¹
- 4.130 The DoA highlighted that the *Agricultural Competitiveness White Paper* contains plans to expand Australia's agricultural disease diagnostic and analysis capacity. The DoA also stated, however, that while it was 'pretty clear there is a gap in Northern Australia in terms of laboratory facilities' that their high cost meant that it was unlikely that a laboratory could be operated in each region of Northern Australia.¹⁶²
- 4.131 Seafarms reported that it will develop its own laboratories for Project Sea Dragon, stating:
- Really, you need a very quick turnaround: if something seems not to be working properly, you want to do your testing and get a test result back the same day – and that service basically does not really exist in Australia.¹⁶³

Northern Australia Infrastructure Facility

- 4.132 In May 2015 the Commonwealth Government announced the Northern Australia Infrastructure Facility (NAIF) a \$5 Billion concessional loan scheme for public infrastructure projects in Northern Australia. A public consultation paper outlining the criteria for eligibility for loans under the NAIF was released on 9 November 2015. Legislation enabling the NAIF is

159 Mr Robert Bartley, AAQ, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 9.

160 Dr Richard Knuckey, Finfish, *Official Committee Hansard*, Cairns, 24 August 2015, p. 34.

161 Professor Chris Cocklin, Senior Deputy Vice Chancellor, JCU, *Official Committee Hansard*, Townsville, 26 August 2015, pp 11-13.

162 Mr Ian Thompson, First Assistant Secretary, DoA, *Official Committee Hansard*, Canberra, 15 September 2015, pp 2-3.

163 Dr Chris Mitchell, Seafarms, *Official Committee Hansard*, Brisbane, 27 August 2015, pp 20-21.

expected to be introduced to Parliament in the first quarter of 2016 with the first loans able to be drawn down in July 2016.¹⁶⁴

- 4.133 The draft criteria for the NAIF includes:
- that that project will enhance economic infrastructure and provide significant public benefit for northern Australia;
 - that the project is unlikely to proceed without NAIF funding;
 - that Commonwealth funding will not amount to more than 50% of total funding; and
 - that the loan is able to be repaid.¹⁶⁵

Industry Capital Requirements

- 4.134 In many cases aquaculture operators in remote locations are importing crucial inputs such as food, juvenile stock, and ice, from Southern Australia at substantial cost. The KADZ is an especially remote area and may be particularly susceptible to industry expansion being impeded by transport costs.
- 4.135 Several witnesses highlighted the need for supporting infrastructure that could reduce the transport costs to and from the KADZ. Maxima Opportunity, stated that the 'biggest challenge for operators in the KADZ will be the lack of pre and post farm gate infrastructure'.¹⁶⁶ The WADF and MPA both nominated a commercial hatchery, feed mills, and fish processing facilities as their key priorities for supporting infrastructure.¹⁶⁷
- 4.136 The Challenger Institute of Technology (Challenger) described the lack of suitable hatchery and nursery facilities in northern Western Australia as an issue that will 'restrict the rapid expansion of [the aquaculture] industry'. Highlighting the difficulties faced by operators in the KADZ, Challenger stated that it had previously raised juveniles for MPA and that the delivery of these juveniles required a 27 hour non-stop truck journey followed by a 6 hour boat journey.¹⁶⁸
- 4.137 The MPA reported that, in partnership with KTI and Challenger, it had attempted to gain approximately \$2 to \$3 million in government funding

164 Department of Industry, Innovation and Science (DIIS), *Northern Australia Infrastructure Facility: Consultation Paper*, November 2015, p. 6.

165 DIIS, *Northern Australia Infrastructure Facility: Consultation Paper*, November 2015, p. 4.

166 Maxima Opportunity, *Submission 22*, p. 2.

167 MPA, *Submission 18*, p. 1; WADF, *Submission 23*, p. 3.

168 Challenger Institute of Technology, *Submission 5*, p. 1.

to transform an unused facility at Mumbannar near Broome into a hatchery, however this had been unsuccessful.¹⁶⁹

- 4.138 As noted above, the ACWA suggested that hatcheries were an example of infrastructure where government assistance would be particularly beneficial. The NTDPIF reported that it had previously operated a commercial hatchery to supply the former barramundi farm on the Tiwi Islands with juvenile stock.¹⁷⁰
- 4.139 The ACWA suggested that having an aquaculture feed mill in Northern WA would be 'extremely valuable to the industry' but recognised that it would be a very capital intensive operation.¹⁷¹ Humpty Doo Barramundi estimated that a feed mill would probably need to generate 100 000 tonnes per annum of food to be viable and that local waste materials, from both animal and vegetable farming, could be used to generate feed.¹⁷²

Marketing

- 4.140 The DoA stated that 'Australia's strength is in producing safe, sustainable, high quality and high-value products such as oysters, salmon, tuna and prawns'.¹⁷³ Austrade observed that this was a definite advantage for marketing aquaculture products in Asia.¹⁷⁴
- 4.141 The DoA suggested that Australian aquaculture products could potentially compete in export markets as premium products but that it would be essential that they capitalise 'on Australia's clean, green, sustainable production methods'.¹⁷⁵ Central to the ability to capitalise on these methods was the 'availability of independent certification services, support and capacity within the Australian Government to certify disease and food safety status'.¹⁷⁶
- 4.142 The PPA reported that the WA Government was supporting aquaculture and fisheries business receiving independent third party product

169 Dr Desiree Allen, MPA, *Official Committee Hansard*, Perth 11 June 2015, p. 53.

170 Mr Glenn Schipp, NTDPIF, *Official Committee Hansard*, Darwin 14 July 2015, p. 3.

171 Ms Tina Thorne, Executive Officer, ACWA, *Official Committee Hansard*, Perth, 11 June 2015, p. 20.

172 Mr Robert Richards, Managing Director, Humpty Doo Barramundi, *Official Committee Hansard*, Darwin, 14 July 2015, p. 33.

173 DoA, *Submission 11*, p. 2.

174 Mr David Watson, Senior Investment Specialist, Investment Division, Austrade, *Official Committee Hansard*, Canberra, 15 September 2015, p. 12.

175 DoA, *Submission 11*, p. 6.

176 DoA, *Submission 11*, p. 6.

certifications.¹⁷⁷ The PPA also stated that it was investigating Maritime Stewardship Council (MSC) certification for the pearl industry suggesting that the certification would mean that:

... every single pearl that bears the MSC label as a certified sustainable Australian South Sea Pearl can have its provenance verified to be from Australia ... [and] says that it is demonstrably sustainable and has fantastic environmental credentials that exceed global best practice.¹⁷⁸

4.143 Cygnet Bay Pearls highlighted the potential of linking marketing and tourism opportunities. Cygnet Bay Pearls reported that its business plan involved greater vertical integration where it sold direct to customers, and incorporated tourism and dining experiences into its pearl farming operations.¹⁷⁹

4.144 Cygnet Bay Pearls recommended the creation of a 'Broome Pearl Region' modelled on the successful Margaret River Wine Region and envisioned multiple pearl farms offering tourism facilities. A customer could 'purchase their pearl earrings from one farm and a matching pendant from another, purchasing pickled pearl meat to send home at one and eat fresh pearl meat pasta at another.'¹⁸⁰ The benefit of a pearl region would be that it would:

... raise awareness and demand for our industry and its product both domestically and internationally whilst offering an entirely new layer of attraction and appeal to the tourism industry of Broome and the Kimberley.¹⁸¹

Country of Origin Labelling

4.145 In 2006, country of origin labelling (CoOL) was introduced into Australia for all seafood sold through the retail sector.¹⁸² Food that is made for immediate consumption, including in dining establishments such as restaurants, cafes, and clubs, is exempt from CoOL.¹⁸³

177 PPA, *Submission 26*, p. 9.

178 Mr Aaron Irving, Executive Officer, PPA, *Official Committee Hansard*, Darwin, 14 July 2015, p. 24.

179 Cygnet Bay Pearls, *Submission 27*, pp. 6-7.

180 Cygnet Bay Pearls, *Submission 27*, p. 7.

181 Cygnet Bay Pearls, *Submission 27*, p. 7.

182 Mr Robert Fish, Chair, Northern Territory Seafood Council, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 1.

183 Food Standards Australia New Zealand, 'Country-of-origin labelling' December 2013, <http://www.foodstandards.gov.au/consumer/labelling/coo/Pages/default.aspx> Accessed 26 October 2015.

- 4.146 In 2008, the Northern Territory removed the food service industry's exemption from CoOL. Currently all seafood sold in the NT, including in restaurants and other dining outlets, is required to identify whether the product originates in Australia or is imported.¹⁸⁴
- 4.147 In December 2014 the Australian Senate Rural and Regional Affairs and Transport References Committee (RRATRC) completed an inquiry into 'current requirements for labelling of seafood and seafood products'. The RRATRC recommended that:
- ... the exemption regarding country of origin labelling under Standard 1.2.11 of the Australia New Zealand Food Standards Code for cooked or pre-prepared seafood sold by the food services sector be removed, subject to a transition period of no more than 12 months.¹⁸⁵
- 4.148 The species *Lates calcarifer*, known overseas as Asian Sea Bass, must be sold in Australia as 'barramundi' regardless of where it was produced. The ABFA reported that this created confusion for consumers stating:
- The issues regarding the omission of CoOL are compounded when iconic species are involved, such as barramundi, as to both Australians and international tourists, barramundi means Australian.¹⁸⁶
- 4.149 The GFB Fisheries recommended that the term 'barramundi' 'should be recognised for its strong provenance and reserved for fish caught or wholly grown in Australia'.¹⁸⁷ Mainstream Aquaculture, however, suggested that this would be difficult stating:
- 'Barramundi' is an [Aboriginal and Torres Strait Islander] name for 'large-scale river fish' and that name was initially bestowed on a species of fish we have in Northern Australia, called saratoga. It was never actually bestowed on what we now know as barramundi. I think legislating to call barramundi – if I can use that name – that originates from South-East Asia [as] 'Asian sea bass' is going to be difficult from an industry perspective.¹⁸⁸

184 Mr Robert Fish, NTSC, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 1.

185 Rural and Regional Affairs and Transport References Committee (RRATRC), *Current requirements for labelling of seafood and seafood products*, Australian Senate, Canberra, December 2014, p. 28.

186 ABFA, *Submission 3.1*, p. 1.

187 GFB Fisheries, *Submission 29*, p. 1.

188 Mr Boris Musa, Mainstream Aquaculture, *Official Committee Hansard*, Townsville, 26 August 2015, p. 34.

Benefits for Producers

4.150 There was widespread agreement amongst aquaculture producers that removing the exemption from CoOL for the food service industry would stimulate growth in the industry. The primary benefit for domestic producers is that CoOL would increase their ability to compete with imported products that generally have lower production costs. For this reason the Northern Territory Seafood Council (NTSC) nominated CoOL as its 'key issue' stating:

It will not matter how much we limit the cost of getting into the business if we cannot sell into [the food services] sector. There is no way we can compete on price; no-one is ever going to claim that we can. Once the labels are there, we do not need to.¹⁸⁹

4.151 Humpty Doo Barramundi supported this view:

The reality is, we have high costs of production; we cannot compete on cost of production at this stage in the industry's maturity. And we are being encouraged to use brand Australia, and export et cetera – but we cannot differentiate our product in our own market. Clearly, the consumers want it. And I think it is fair to the producers – because we carry the burdens that we do – that we should be allowed to differentiate.¹⁹⁰

4.152 The NTSC, ABFA and APFA all highlighted that, since the introduction of CoOL in the retail sector, the seafood industry had made significant investment in improving traceability and labelling throughout the supply chain.¹⁹¹ In the food services sector, however, this investment was not benefitting producers or restaurant customers as the seafood is labelled 'to the back door of the restaurant, and then somewhere between the back door and the menu it gets lost.'¹⁹²

4.153 The ABFA stated that a side-effect of the absence of CoOL was that any marketing undertaken for barramundi could, unintentionally, also be promoting imported barramundi.¹⁹³ The NTSC also noted this issue reporting that since the introduction of CoOL in the Northern Territory its

189 Mr Robert Fish, NTSC, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 3.

190 Mr Robert Richards, Managing Director, Humpty Doo Barramundi, *Official Committee Hansard*, Darwin, 14 July 2015, p. 29.

191 Mr Robert Fish, NTSC, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 3; Mr Marty Phillips, ABFA, *Official Committee Hansard*, Cairns, 24 August 2015, p. 25; Ms Helen Jenkins, Executive Officer, APFA, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 13.

192 Ms Helen Jenkins, APFA, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 13.

193 Mr Marty Phillips, ABFA, *Official Committee Hansard*, Cairns, 24 August 2015, p. 22.

members had been much more willing to commit funds to marketing campaigns.¹⁹⁴

- 4.154 Mainstream Aquaculture, which sells both barramundi grown in Australia and barramundi grown in Singapore, supported CoOL and was a 'big believer in having an informed consumer'.¹⁹⁵ When asked about how its barramundi grown in Singapore was labelled, Mainstream Aquaculture replied:

We supply large distributors who then supply wholesalers who then supply the hospitality industry. So do we know what the restaurateur is doing with respect to his menu? Unfortunately we do not. We would like to. We would like them to be obliged to put 'Product of Singapore' on there.¹⁹⁶

Country of Origin Labelling for Pearls

- 4.155 Despite not being subject to the same legislative framework as seafood CoOL was also a significant issue for pearl producers. Cygnet Bay Pearls stated that instituting CoOL was, in the short to medium term, 'definitely the highest priority to ensure continued activity and investment in the [pearl] industry.'¹⁹⁷ The introduction of hatchery technology overseas and the impacts of disease in the Australian industry had removed the Australian pearl industry's key competitive advantages over low-cost overseas producers. Given this, Cygnet Bay Pearls highlighted the increased importance of CoOL stating:

There is one last niche available to the Australian industry – the premium consumers are prepared to pay for the provenance of an Australian pearl. If the Australian producers could realise that premium, the competitive advantage could insulate us from other 'low cost' SE Asian producers in perpetuity. The last few producers are actively pursuing this strategy, however in the absence of effective tools to enforce that differentiation at point of sale our efforts are in isolation and virtually impossible to achieve.¹⁹⁸

- 4.156 The main impediment to Australian pearl businesses benefitting from the premium consumers are willing to pay for their product is the practice of

194 Mr Robert Fish, NTSC, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 5.

195 Mr Boris Musa, Mainstream Aquaculture, *Official Committee Hansard*, Townsville, 26 August 2015, p. 34.

196 Mr Boris Musa, Mainstream Aquaculture, *Committee Hansard*, Townsville, 26 August 2015, p. 39.

197 Cygnet Bay Pearls, *Submission 27*, p. 9.

198 Cygnet Bay Pearls, *Submission 27*, p. 8.

imported pearls being misleadingly marketed as Australian pearls. Cygnet Bay Pearls stated:

... misleading sales techniques leveraging off our industry's provenance are widespread across domestic retail, domestic wholesale and international wholesale markets ... Whilst these sales techniques are deceptive and immoral the fact that our Australian pearl brand is falsely utilised in this way reinforces the intrinsic value our industry's product has which is currently not being utilised to drive investment and value back into our production companies.¹⁹⁹

Benefits for Consumers

4.157 The NTSC reported that the wholesale price of imported barramundi was about half the price of Australian barramundi and that this translated to about a \$2 to \$3 difference per serving. Barramundi is often the most expensive dish on a menu despite most commonly being made with imported fish. The NTSC suggested this was only possible because customers assumed the barramundi was an Australian product. This enabled food service industries to take the \$2 to \$3 differential as profit rather than passing the lower cost on to customers.²⁰⁰ The NTSC estimated this 'hidden gain' could be worth over a billion dollars to the food service industry and suggested this was coming at a direct cost to consumers and Australian producers.²⁰¹

4.158 The GFB Fisheries also emphasised the role of CoOL could play in protecting consumers by providing them with more accurate information stating it was an issue 'about truth in labelling. It is about honesty. It is about not ripping off consumers.'²⁰²

4.159 For consumers the benefits of CoOL are not only that it should help ensure they are charged the appropriate price for seafood but also that it should help them make more informed purchase choices. Humpty Doo Barramundi highlighted the benefits of helping consumers make informed choices by noting the wide variety of reasons people may have a preference for purchasing Australian seafood stating:

I think that Australians want to buy Australian product for a range of different reasons. Some will do it to support Australian small businesses and Australian jobs; some may be concerned about

199 Cygnet Bay Pearls, *Submission 27*, p. 9.

200 Mr Robert Fish, NTSC, *Official Committee Hansard*, Brisbane, 27 August 2015, pp 2, 4.

201 NTSC, *Submission 32*, p. 2.

202 Dr Kenneth Chapman, GFB Fisheries, *Official Committee Hansard*, Cairns, 24 August 2015, p. 17.

food safety issues; some may be concerned about eating quality issues; some may be concerned about other issues, such as the sustainability of the resource, whether slave labour is being used, whether there is malachite green in the production ...²⁰³

The Northern Territory Experience

- 4.160 The RRATRC inquiry into seafood labelling found that the experience of instituting CoOL in the food services industry in the Northern Territory had been predominantly positive. Many customers had been initially surprised to discover that products such as barramundi were not always Australian and the change had increased customer knowledge of the provenance of seafood products. Customers had also shown a willingness to pay a premium to purchase local products.²⁰⁴
- 4.161 Despite initial reservations, representatives of the food service industries had also reported experiencing benefits from the introduction of CoOL in the Northern Territory. The proprietor of Deck Bar, The Arch Rival and Nirvana told the RRATRC Inquiry that:

I can tell you that our initial reaction, like most, would have just been that it was one more damn regulation we had to follow... We got over it fairly quickly when the customers started to ask these questions. They wanted to know where their product came from, they wanted to know if it was local or if it was imported and they would show ... with where they spent their money ... what they wanted.²⁰⁵

Concluding Comment

- 4.162 Northern Australia offers unique features which provide an opportunity to expand aquaculture. These are: a pristine environment, suitable growing conditions, suitable species, and a population willing to be involved in aquaculture.
- 4.163 Aquaculture is set to expand in Western Australia and the Northern Territory and possibly in Queensland, and this will increase the need for a

203 Mr Robert Richards, Humpty Doo Barramundi, *Official Committee Hansard*, Darwin, 14 July 2015, p. 30.

204 RRATRC, *Current requirements for labelling of seafood and seafood products*, Australian Senate, Canberra, December 2014, p. 14.

205 Mr Jason Hanna, Owner of Deck Bar, The Arch Rival and Nirvana, in RRATRC, *Current requirements for labelling of seafood and seafood products*, Australian Senate, Canberra, December 2014, p. 15.

skilled workforce. Training institutes will need to provide industry focused courses to train employees to meet the anticipated demand from expanding aquaculture ventures.

- 4.164 Opportunities exist for increasing aquaculture related research of relevance to Northern Australia. The Committee has seen first hand the impact of oyster oedema disease on the pearl oyster industry. There should be an increased research effort to identify the causative agent and the remedial action which can be taken. The effect of seismic testing on non-mobile species such as oysters is also of concern.
- 4.165 The Committee received evidence that the Fisheries Research and Development Corporation has considered a 'northern node' for funnelling research into Northern Australian issues, but with no outcome. The Committee believes that introducing such a node would provide an avenue for funding research relevant to Northern Australia.
- 4.166 The JCU is increasingly becoming a hub for aquaculture research and training for Northern Australia and the Committee encourages this development.
- 4.167 The Committee is concerned with evidence that the outcomes of publicly funded research may not be being disclosed. The Committee considers that, as a matter of principle, disclosure through published papers should be the norm, unless dictated by exceptional circumstances.
- 4.168 Aboriginal and Torres Strait Islander communities comprise a large proportion of the population of Northern Australia and it is important to involve them in aquaculture enterprises. The Committee draws attention to the principles developed by AIMS and considers this should be a template for involving Aboriginal and Torres Strait Islander communities in aquaculture. The Committee is encouraged by the positive example of engagement with Aboriginal and Torres Strait Islander people demonstrated by industries involved in crocodile farming and trepang ranching.
- 4.169 The Committee is confident aquaculture companies are taking steps to reduce their environmental impact and comply with environmental regulatory requirements. Adversely affecting the environment is not in the best interests of an industry which benefits from a 'clean green' marketing image.
- 4.170 In its previous report, *Pivot North*, the Committee recognised the need for significant infrastructure investment in Northern Australia. There is a need to develop infrastructure to assist the development of aquaculture in the Kimberley to service the Kimberley Aquaculture Development Zone and in the Northern Territory to service the proposed Project Sea Dragon. Such infrastructure would benefit other industries and assist in further

developing Northern Australia. Other aquaculture development zones should be assisted by infrastructure developments when they are near to being declared.

- 4.171 Pests and diseases are an ongoing risk to aquaculture and rapid diagnosis is essential to addressing outbreaks. There is a lack of pest and disease diagnosis facilities in Northern Australia and in particular in North Queensland. Siting such a facility on a university campus would enable access to a broad range of scientific expertise which could be harnessed to serve other primary industries.
- 4.172 Other infrastructure such as hatcheries, feed mills and fish processing facilities will be needed as the aquaculture industry expands in Northern Australia. Developing these facilities should be led by industry demand. The Northern Australia Infrastructure Facility may be an appropriate avenue for providing funding because it involves a long term industry commitment.
- 4.173 Over 60 per cent of seafood consumed in Australia is imported and this offers a great opportunity for import substitution. An obstacle is the exemption from country of origin labelling requirements for food prepared for immediate consumption, including in dining establishments such as restaurants, cafes, and clubs.
- 4.174 This is not the case in the Northern Territory. Removing the country of origin labelling exemption in the rest of Australia would provide an important stimulus to the aquaculture industry in Northern Australia.
- 4.175 The Committee believes the evidence supporting the removal of this exemption is compelling, and in particular the evidence from Northern Territory food outlets. Consumers should know where the food they eat is produced so that they can make informed choices.
- 4.176 The Committee supports the recommendation of the Senate Rural and Regional Affairs and Transport References Committee that the exemption for country of origin labelling under Standard 1.2.11 of the Australia New Zealand Food Standards Code for cooked or pre-prepared seafood sold by the food services sector be removed.
- 4.177 Consideration should also be given to introducing country of origin labelling for aquaculture products such as pearls so that consumers are not misled as to their origin. This country of origin labelling could be extended to include crocodile teeth because Australia imports significant numbers of crocodile teeth from Papua New Guinea. Although the Committee has not received evidence on this issue, retailers might be allowing purchasers to believe imported crocodile teeth are an Australian product.

Recommendations

Recommendation 7

- 4.178 The Committee recommends that the Fisheries Research and Development Corporation should consider introducing a 'northern node' as an avenue for providing funding research relevant to Northern Australia.

Recommendation 8

- 4.179 The Committee recommends that the Australian Government provide funding assistance for developing road and port infrastructure to service the Kimberley Aquaculture Development Zone and Project Sea Dragon subject to establishing a positive cost-benefit analysis.

Recommendation 9

- 4.180 The Committee strongly recommends that the Australian Government provide funding assistance for the establishment of a pest and disease diagnosis facility in Northern Queensland.

Recommendation 10

- 4.181 The Committee recommends that the Australian Government, through COAG, remove the exemption from country of origin labelling requirements under Standard 1.2.11 of the Australia New Zealand Food Standards Code for cooked or pre-prepared seafood sold by the food services industry.

Recommendation 11

- 4.182 The Committee recommends that the Department of Industry reports within 12 months on the feasibility of introducing country of origin labelling for aquaculture products such as pearls and crocodile teeth.

Hon Warren Entsch MP
Chair

2 February 2016