Response to the National Food Plan issues paper

by the Fisheries Research and Development Corporation

The FRDC's mission
is to increase economic and social benefits
for the fishing industry and the people of Australia,
through planned investment in research and development,
in an ecologically sustainable framework.

2 September 2011

This submission outlines the issues that are critical to the Fisheries Research and Development Corporation and the fishing industry. It encompasses the prevailing views of both the fishing industry and the Corporation, which are closely aligned.

The Corporation would be happy to facilitate any further discussions involving the fishing industry so that the National Food Plan may take account of the industry's needs.

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EXECUTIVE SUMMARY

The world context for seafood

Aquaculture is the world's fastest-growing industry in primary animal food production.

Seafood is the world's most consumed source (in terms of tonnage) of animal protein.

Many products are produced for human benefit from the parts of fish that do not end up on the plate, such as nutriceuticals (glucosamine, chondroitin, etc.) and dietary supplements (e.g. fish oil). Fish products also include industrial materials, animal feeds and chemical products.

Australia's reputation in fisheries management

Australia's wild fisheries management, in which government agencies, industry and non-government organisations collaborate, is ranked as being among the top five management regimes world-wide (Pitcher, Kalikoski, Pramod, & Short, 2009: 457), (Bank & Macfadyen, 2010), (Alder & Pauly, 2008).

Opportunity

Australia has the world's third-largest exclusive economic zone and seventh-longest coastline, encompassing the world's greatest marine diversity. Consumers in Australia and overseas benefit from the multitude of offerings from wild-caught seafood.

The world's fastest-growing market for seafood consumption — South-east Asia, including China — is on Australia's doorstep.

Gaps between supply and seafood consumption in both South-east Asia and Australia (in Australia, a gap of 610,000 tonnes in 2020 and 925,000 tonnes in 2050 has been forecast) present opportunities for significant increases in production.

Opportunities also exist in seafood processing, market development and brand development; and for improvement in community perceptions of the seafood industry, especially through establishing environmental standards for reporting to the community.

Production

Production from Australia's wild-catch fisheries is capable of being increased through further innovation in production from under-utilised species and development of more efficient regulatory frameworks that provide incentives for innovation, among other things. Aquaculture can significantly increase seafood production utilising the nation's considerable natural assets. Australia needs to catch up on its competitors in mobilising these assets (Census of Marine Life International Secretariat, 2010).

Domestically, better consumer understanding of seafood's provenance and sustainability through improved labelling and branding would stimulate demand, leading to increased production.

Health benefits

Encouraging Australians to eat more seafood will bring significant health benefits through all life stages, from babies to elderly people.

Innovation

To be competitive, the seafood industry needs to increase innovation throughout the supply chain to boost productivity, develop new products and increase production. These factors are also crucial to industry growth.

Research

The Fisheries Research and Development Corporation (FRDC) is widely regarded as the leading Australian agency concerned with planning, investing in and managing fisheries research, development and extension, and with delivery of outcomes from research, development and extension (RD&E).

A strong national and industry commitment to RD&E is essential to enhancing the production value chain and bringing about the productivity improvements by which the industry will prosper.

1. INTERNATIONAL FOOD CONTEXT

A. GLOBAL FOOD PROTEIN SUPPLY

Key facts

At a global level, seafood is the most important animal protein in the human diet, comprising about one-third of all animal protein intake. In developing countries especially, seafood is more prominent, not only because the amount is higher (in Cambodia, about 80% of protein intake) but also because it supplies a source of fresh, healthy food without which people would be malnourished.

World seafood consumption is growing at about 2.5% per year, at which rate the quantity required will be double present tonnage by about 2050.

The gap between seafood demand and supply represents a challenge for the entire world and a challenge for the seafood industry, especially Australia's.

FOOD COMMODITY OUTLOOK

The world population grew by 1.2% p.a. to reach 6.8 billion in 2010. Growth is expected to slow to 1.05% p.a. over the next decade (OECD-FAO, 2011, p. 22). Population growth will vary significantly between regions — Japan and Europe will continue to stagnate, while net additions to population in Asia will fall significantly. Strongest growth in the OECD Member States is forecast to occur in Turkey, Mexico, USA and Australia.

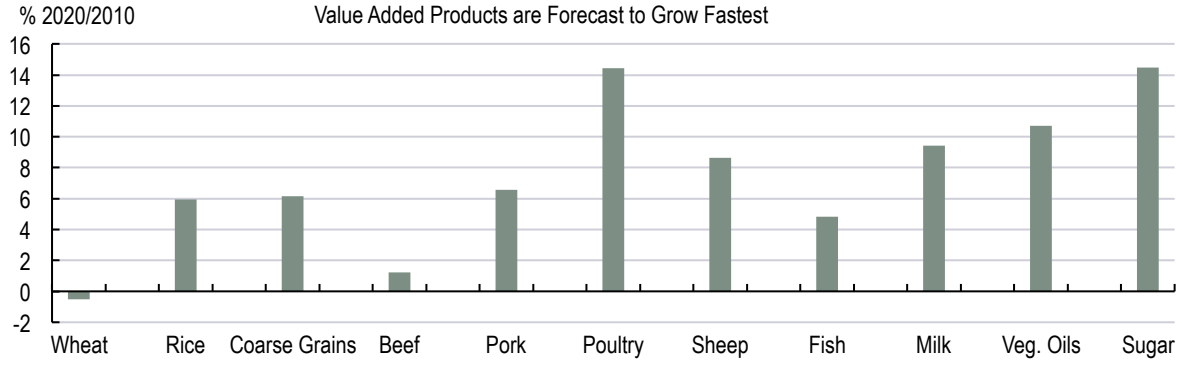
Global agricultural production is projected to grow faster than average global population for the next decade, but at a slower average rate of 1.7% p.a., compared to 2.6% p.a. in the last decade (OECD-FAO, 2011, p. 14). A slowdown in projected yield improvements of key crops will exert upward pressure on food prices, partially offset by greater use of technology in emerging markets. Per capita food consumption will expand most rapidly in Eastern Europe, Asia, and Latin America due to rising incomes and slowing population growth.

The highest increases in food demand are forecast by the OECD–FAO to be in vegetable oils, sugar, meat, and dairy products. Rising incomes in China and India, in particular, will drive food commodity demand, in parallel with a shift in diets from staple foods to value-added and higher protein products such as meat and dairy foods.

The OECD–FAO believe the key drivers for production risk and price over the coming decade include weather and climate change, stock levels to satisfy volatile short term demand, energy input prices, exchange rates, rising per capita demand in both developed and developing economies, resource pressures (such as high input costs, slow technology application, irrigation water availability, and expansion into marginal lands), trade restrictions for both exports and imports, and the adverse impacts of speculators in markets.

Global support policies and biofuel mandates in leading markets are expected to underpin robust growth in the use of agricultural outputs as feedstock for biofuels. Higher real prices for oil, coal and gas will induce further innovation and development of new energy sources and feedstocks.

Figure 1. Forecast Growth in Per Capita Consumption of Food Products 2010–20

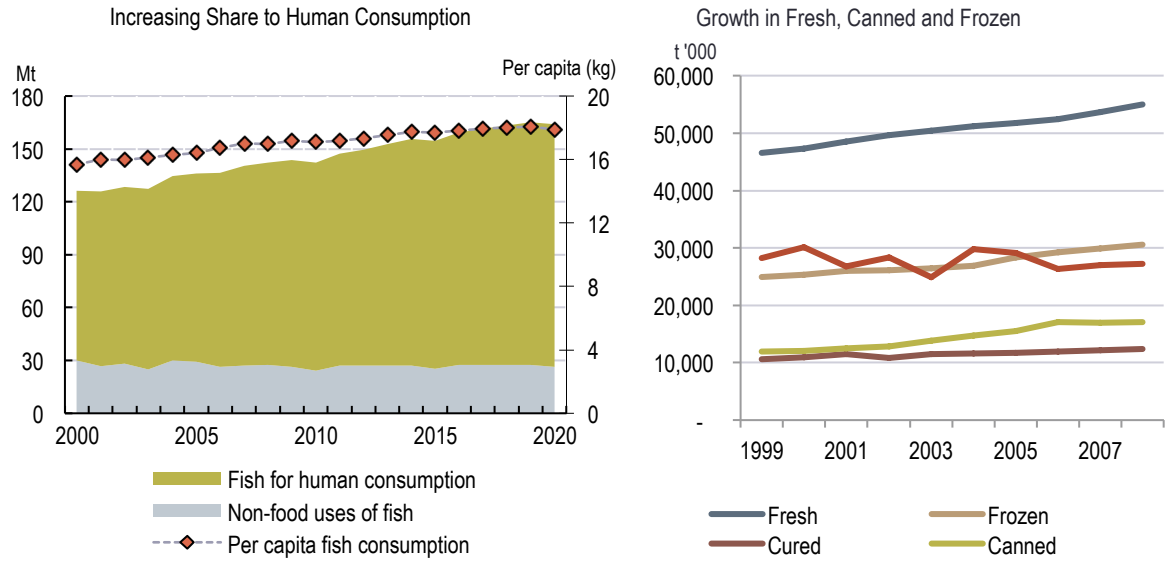


(OECD-FAO, 2011, p. 32)

Fishery products

Globally, fish production is larger than any other single meat category. Total world fishery supply (including edible and non-edible products) has risen 16% in the decade to 2008, to 142 million tonnes (FAO Yearbook 2008, p. 38). Almost 81% of supply in 2008 was destined for human consumption — fresh products comprised 40%, and other forms (frozen, cured or canned) comprised the balance of 41%. The non-edible balance of fishery supply was used as fishmeal and fish oil, culture, bait, and pharmaceutical uses as well as for direct feeding in aquaculture and for fur animals.

Figure 2. World Fishery Supply and Use



Since the mid-1990s, the proportion of fish for human consumption has grown as more fish is used as food and less for producing fishmeal and fish oil. (FAO, 2010, p. 9) This trend is expected to continue for at least the next decade. Average annual growth has been strongest in canned products (4.1%), followed by frozen (2.3%), fresh (1.9%) and cured products (1.6%) (FAO, 2010, p. 38).

EDIBLE FISH PROTEIN

In the last three decades the global food market has experienced unprecedented expansion and a change in global dietary patterns, with a shift towards more protein. This change results from complex interactions of several factors, including rising living standards, population growth, rapid urbanization, increased trade and transformations in food distribution.

The FAO estimates global fish per capita consumption in 2008 at 17.1 kg (17.0 kg in 2007). Fish food supply (both total and per capita) has increased at 3.1 % p.a. in the last five decades, nearly twice the rate of growth in world population (FAO, 2010, p. 66).

Figure 3. Global and Regional Fish Food Supply, 2007

	Total Food Supply	Per Capita Food Supply
	Million tonnes live weight equivalent	*Kg/year*
World	113.1	17.0
Latin America (including the Caribbean)	5.2	9.2
North America	8.2	24.0
Oceania	0.9	25.2
Europe	16.2	22.2
Africa	8.2	8.5
Asia	74.5	18.5

(FAO, 2010, p. 66)

Across the global population 17.1 kg per capita consumption equates to a modest 6% (or 4.7 grams/capita/day)[1] of average daily per capita food protein supply.

Globally, there are 4.5 billion people (2 of every 3 people) who rely on fish to provide at least 15% of their animal protein (FAO, 2010, p. 64). For some countries where traditional alternative food protein sources are limited (e.g. Iceland) the proportion is closer to 50%.

Change in both dietary interactions and regional food protein trends are quite variable both across and within countries and food markets. Over the last 50 years the fastest growth in fish consumption per capita has occurred in East Asia (from 11 kg to >30 kg) and South East Asia (from 13 kg to 30 kg) (FAO, 2010, p. 64). Within China, the average per capita income of some 200 million consumers in Shanghai and other large Chinese cities is more than 5 times that of the billion rural/semiurban consumers[2].

Today's consumer[3] in a developed economy consumes food protein at a far greater rate than their fellows in developing economies. In 2005–07 the average North American consumed 113 grams per day of food, a rate that is 1.5 times the average global rate (76.5 grams per capita per day), and more than 1.8 times that of the average resident of Africa (62 grams per capita per day).

Across developing Asia where fish protein is at the heart of both traditional and contemporary diets, fish provided 22% of all meat protein consumed, compared to Africa (18%), the World (16%), Europe and Oceania (11%), North America (8%), and Latin America including the Caribbean (7%).

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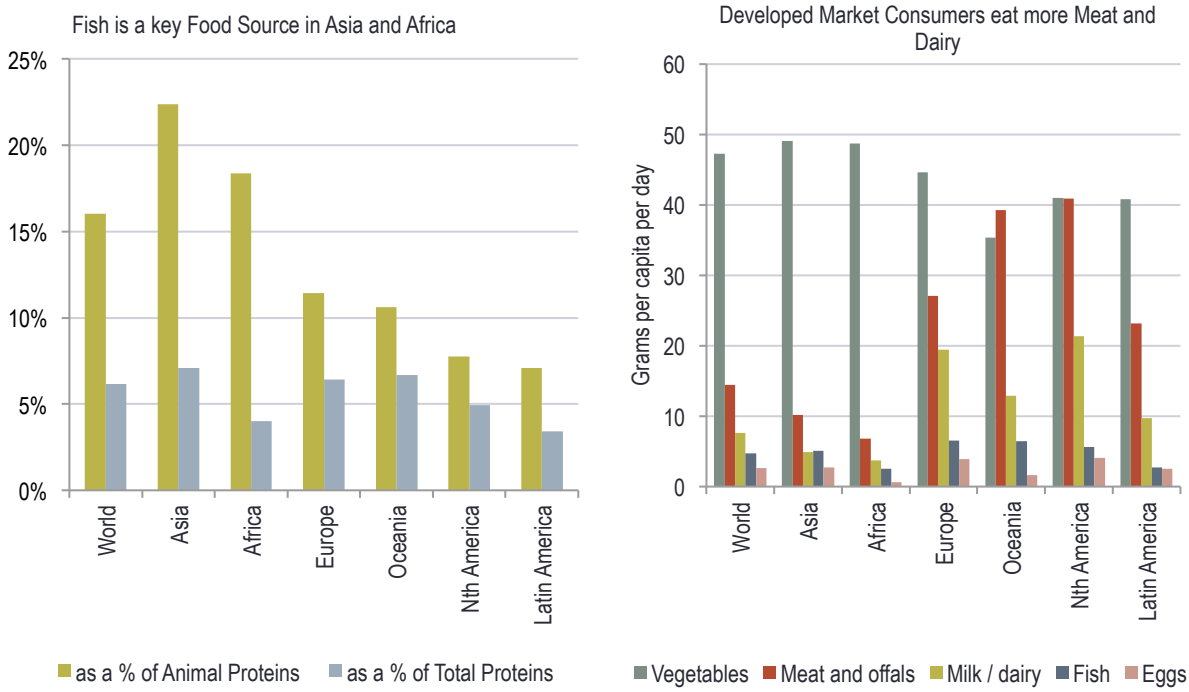
1 ABARES slide from FRDC: Total Protein Supply by Continent and Major Food Groups 2005–07.

2 Pers comm, Mr Naveen Rao, Chief Strategy Officer, Grey Group, Shanghai, China, 22 July 2011.

3 Consumption here refers to actual food consumed and protein that is supplied but not consumed (i.e. wasted).

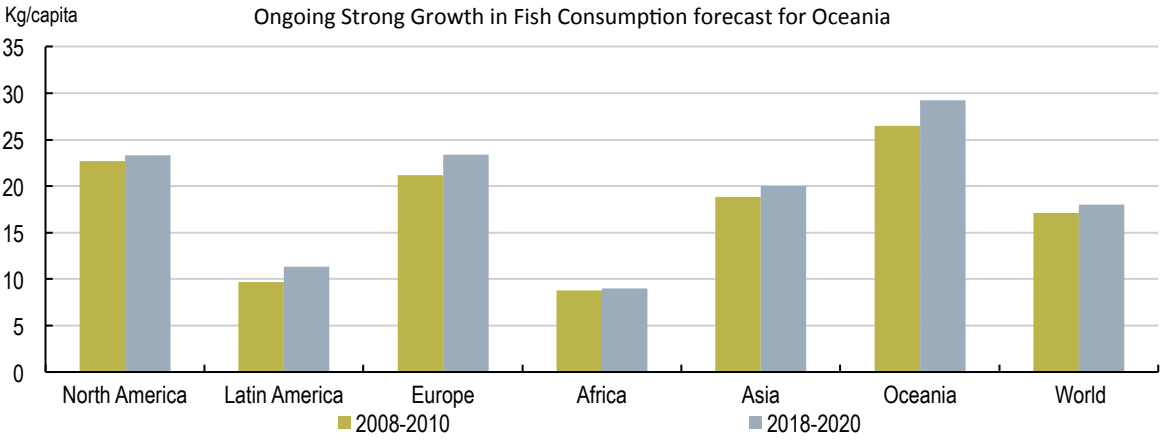
Figure 4. World Food Protein Supply by Food Group and Region 2005–07



Fish consumption outlook

Looking forward ten years, the OECD–FAO (OECD-FAO, 2011) predicts increases in both per capita and total fish consumption, especially in Latin America (including the Caribbean), Europe, Asia and Oceania. World fish consumption (edible products only) is forecast by the OECD–FAO to reach 17.9 kg in 2020, a 4.6% increase over the coming decade. (OECD-FAO, 2011, p. 148)

Figure 5. Forecast per capita Fish Consumption by Continent in 2010 and 2020



The big question is: will Asia's large developing food markets continue to retain their traditional fish protein dominance, or will they switch strongly to meat, offal and dairy products as has occurred in more mature Asian markets such as Japan and South Korea?

B. SEAFOOD TRADE

Key fact

The world's fastest-growing market for seafood consumption — South-east Asia, including China — is on Australia's doorstep, presenting a significant market opportunity.

Fish are the most traded global food protein. In 2008, the value of global seafood imports amounted to US$107 billion.[4] Over 50% of the value of global fisheries production and about 40% of the live weight equivalent of fish and fish products enter international trade. Both fish and harvest licenses are widely traded and are a key source of foreign exchange for many developing countries. For example, Mauritania has licensed many EU flagged vessels to fish its offshore waters and recently signed a 25 year tax-exempt fishing license with a Chinese firm for exports to European markets[5].

In real terms (adjusted for inflation), fishery exports grew by 11% in the period 2006–08 and by 50% per cent between 1998 and 2008 (FAO, 2010, p. 9).

In 2008 the top 6 importers by value (Japan, USA, Spain, France, Italy, China) took an aggregate US$52.6 billion in imports or 49% of all globally traded seafood. The top 22 markets collectively imported 85% of imported value. Both the USA and China are in the top 6 for both imports and exports. According to the FAO 2008 data, Australia ranked 21st in the world as a seafood importer (US$1.1 billion) and 28th as an exporter (US$949 billion). (FAO Yearbook 2008, p. 42).

World seafood import growth has been quite strong at over 9% p.a. since 2005, albeit prior to the impacts of the global financial crises and related impacts. Import growth for most leading importers has declined, including for Australia, as the economic crises intensified. Notably import growth for China continues to be very strong.

Figure 6. Seafood Importers 2008 ($US '000)

Rank	Importer	2005	2006	2007	2008	Growth 2005-06	Growth 2006-07	Growth 2007-08
	World	**81,726,699**	**90,051,215**	**98,038,220**	**107,127,925**	**10%**	**9%**	**9%**
1	Japan	14,438,337	13,970,740	13,184,490	14,947,450	-3%	-6%	13%
2	USA	11,982,336	13,271,315	13,631,511	14,135,383	11%	3%	4%
3	Spain	5,632,087	6,359,092	6,980,372	7,101,147	13%	10%	2%
4	France	4,562,629	5,069,238	5,366,203	5,835,957	11%	6%	9%
5	Italy	4,224,081	4,716,917	5,143,834	5,453,104	12%	9%	6%
6	China	3,979,232	4,125,990	4,511,576	5,143,432	4%	9%	14%
21	Australia	827,739	894,622	1,065,860	1,101,164	8%	19%	3%

The OECD–FAO forecast that fishery products will continue to be highly traded over the next decade. The expansion of trade will be affected by a number of issues:

- availability of new technologies such as breeding;

[4] The world export trade value (*FAO Yearbook 2008*, p. 42) was US$102 billion.

[5] *The Africa Report*, June 2011.

- changes in species and the use of innovative products that use more of the fish;
- competition (especially on prices) with other food products such as chicken and meat;
- relative prices and margins to value chain participants;
- rising commodity prices including inputs to aquaculture such as soybeans and fish feeds;
- rising energy prices;
- perceived and real risks to human health (e.g. marine biotoxins) and the benefits to human health from nutritious food;
- consumer and community concerns about overexploitation of stocks and sustainability;
- use of private supply chain standards (e.g. social and environmental) and their endorsement by major/global retailers;
- certification and traceability requirements and related compliance;
- trade access via bilateral and plurilateral agreements (e.g. Free trade Agreements) and disputes related to selected fish species that may impact bilateral trade;
- the stalled progress of the WTO Round, the treatment of fish and seafood categories, and the management of sustainability protocols; and
- climate change / carbon emissions.

C. AQUACULTURE

Key fact

With world wild-catch production reaching a natural plateau, investment in aquaculture is growing rapidly to ensure an increased seafood supply.

Aquaculture offers many benefits to consumers and seafood supply chain participants, including year round supply, product consistency, greater supply chain control and security, cheaper prices, and opportunity to underpin the sustainability of wild-catch fisheries[6] (Intuitive Solutions, 2011). Global fish production will continue to be driven by aquaculture (OECD-FAO, 2011, p. 29).

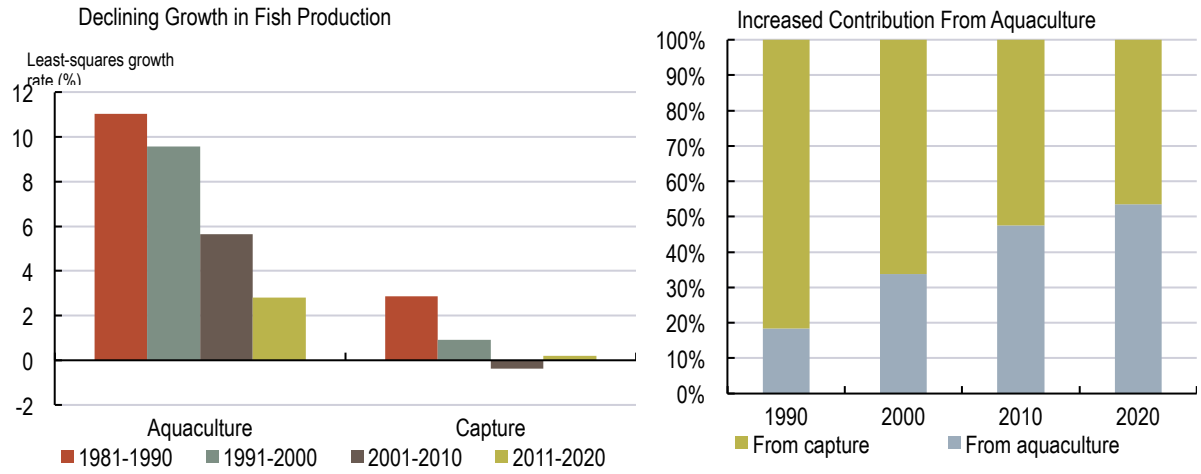
Total fisheries production growth is projected to slow to 1.3% p.a. (15% p.a. over the decade) on average through to 2020, largely driven by slowing aquaculture growth from the previous decade (2.8% p.a., compared to 5.6% p.a. for 2001–10).

Wild catch fishery production has peaked at around 90 million tonnes and is expected to continue to decline. The FAO estimates about half of the wild-catch fishery stocks are fully exploited, a further 32% are either overexploited, depleted or recovering from depletion, and a further 15% are under exploited or only moderately exploited (the latter being the lowest percentage on record since the mid-1970s) (OECD-FAO, 2011, p. 154).

[6] A national survey conducted for the FRDC in 2011 found that 78% of people believe fish farming is sustainable, compared to 60% for customary fishing, 67% for recreational fishing and 27% for commercial wild-catch fishing.

By 2015 aquaculture is expected to pass wild-catch fisheries as the primary source of fish protein for human consumption. By 2020 aquaculture is forecast to represent about 45% of total fishery products. Over 80% of world aquaculture production is located in Asia — China alone comprising 60%.

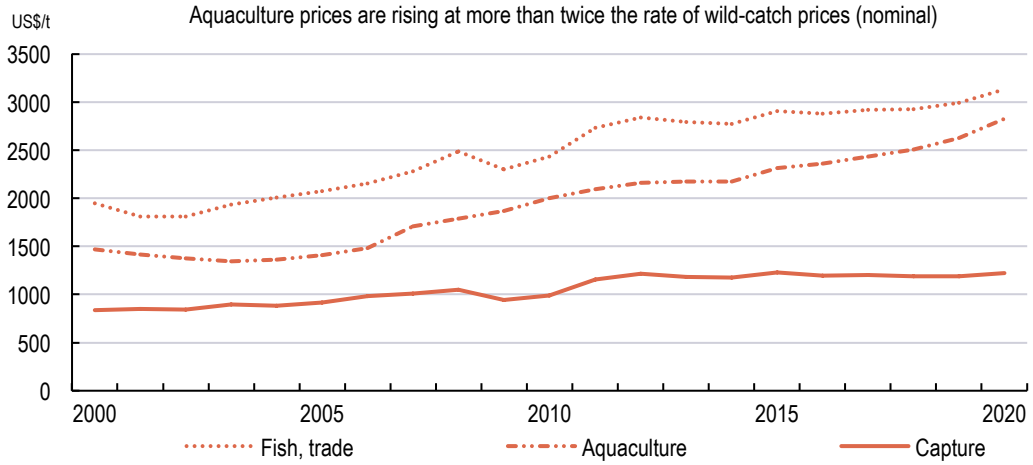
Figure 7. Changes in Contribution by Wild-catch Fisheries and Aquaculture by Decade



Reduced growth in aquaculture is expected due to production and supply chain bottle necks mostly associated with fish farms. The easy sites have all been secured – global aquaculture is becoming far more competitive. Local investors will need to be more diligent in their planning and regulators more careful in approving new aquaculture sites, partly in response to community concerns about sustainability. Landmark changes recently announced in NZ and the USA (Fishupdate.com, 2011) suggest legislators must move to a more pragmatic and flexible approach to delivering pathways for large scale and sustainable aquaculture ventures.

OECD–FAO forecast average nominal prices for wild-catch species will be about 20% higher in 2020 than in 2010. Consumer preferences for safe, sustainable, attractive, available, and uniformly presented seafood are expected to increase nominal aquaculture prices at more than twice the rate of wild-catch fish prices. Aquaculture prices are forecast to increase by 50% by 2020.

Figure 8. Forecast World Nominal Fish Product Prices 2000–2020



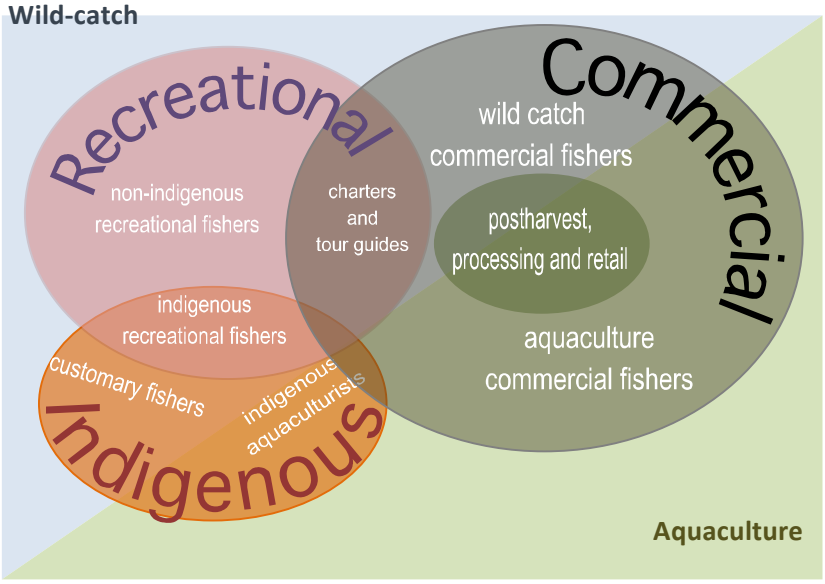
2. AUSTRALIAN FOOD CONTEXT

A. CONTEXT

> ***Key fact***
>
> Australian investment in aquaculture is also growing to ensure an increased seafood supply in the face of increased consumption.

The Australian fishing and aquaculture industry is based on three areas of activity – commercial fishing and aquaculture, recreational fishing, and indigenous customary fishing.

Figure 9. Australian Fishing and Aquaculture Activities



This complex structure of resources, jurisdictions, and stakeholders presents unique challenges and opportunities for investors, operators, communities and resource managers.

Most Australian fisheries are small by world standards, low yielding, and remote from processors and food consumers. All are exposed to extreme and ongoing currency pressure driving processed fish imports or export customer's anger about high prices. Although there are some strong exceptions (e.g. wild abalone, aquaculture salmon), most Australian wild-catch and aquaculture fisheries lack both the scale necessary to viably service their customers through hard times, and the economics to invest in capacity and innovation that will drive productivity to create long term profits and surpluses.

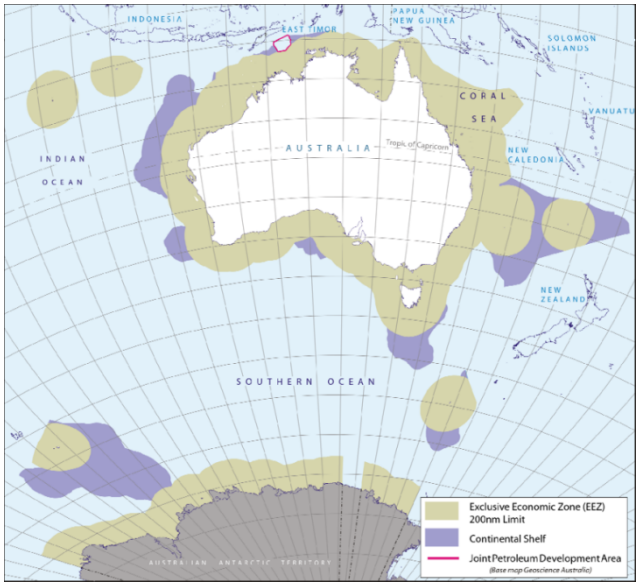
RESOURCES

> ***Key fact***
>
> Internationally, Australia's wild fisheries management, in which government agencies, industry and NGOs collaborate, is ranked among the top five management regimes world-wide.

Australia invests significantly to maintain high quality marine and aquaculture fishery environments. With some of the most rigorous environmental compliance regimes in global fishing, Australian

marine and aquaculture fisheries are exemplars of environmental sustainability and conserved biodiversity.

Figure 10. Australian Fishing Zone



While this makes unit costs higher, Australian seafood is and will be increasingly attractive over the next 20 years to high-end consumers in mature and emerging markets concerned about misuse and degradation of natural resources.

Australia has an extensive and underutilised wild fishery zone and coastline. Australia's 22 million consumers has sovereign rights over the world's third largest fishing zone (13.6 million sq km) providing habitat for 4,500 finfish species and thousands of invertebrate species. Their coastline (excluding island territories) is the world's seventh longest (Wikipedia) at 34,218 km (SEWPAC, 2006) and embraces diverse and pristine marine ecosystems from the tropics to Antarctica. The seafood industry has substantial infrastructure in ports, airports, freight lines and maintenance facilities across the region. This national wild-catch fishery ranks 60th in global tonnage terms producing only a small number of low volume-high value species, typically for fresh unprocessed export markets – lobster, southern bluefin tuna, abalone and prawn.

While the low production capabilities of these marine fisheries offer little opportunity to increase tonnage, there is significant opportunity to use the expansive natural marine resource to establish viable wild-catch fisheries based on novel and underutilised species. However, a prerequisite for such an outcome is a joint move by the wild-catch sector and fishery managers to overcome the current $1 million per day underperformance gap (FRDC, 2009) through productivity gains and utilising available resources – natural, human, financial and technological. Recent operator restructure of some substantial fisheries (e.g. Northern Prawn) confirms that investors are keen to address the underperformance challenge for existing wild-catch fisheries. Governments should seek ways to support such initiatives.

Apart from underperformance in existing fisheries, there is low utilisation of existing marine resources and biodiversity. There are many candidate species available as new target species (both wild-catch and aquaculture) such as Bight Redfish, Blue Warehou, Yellowtail Kingfish and Black Kingfish. The current excessive focus on high value–low volume species is a direct result of market failure. Existing seafood businesses and investors have been unwilling to invest in new species, new fisheries and new markets unless they could capture the long term market benefits from such investment. Unlike the NZ industry (which has a similar turnover of around $2.2 billion p.a.), the Australian seafood industry has not developed sophisticated seafood value adding and supply infrastructure to manage the underutilised low value–high volume species on offer. A new approach to collective investment (possibly in ventures with NZ interests) in the fixed costs for such developments will create new opportunities for seafood sales.

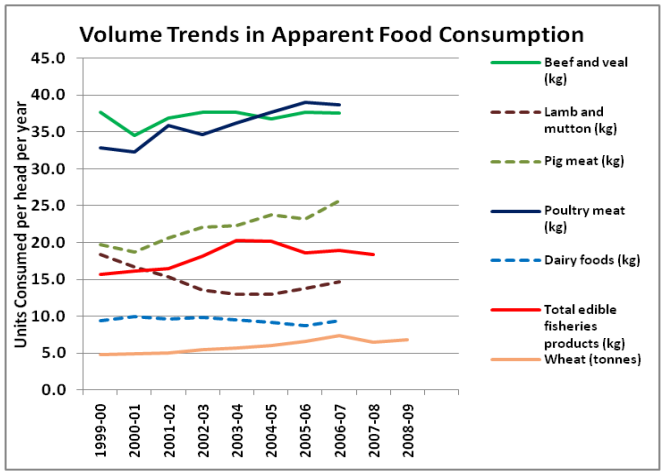
Aquaculture has been slow to develop in Australia, much slower than in Asia. The sector is still in its infancy with regard to genetics, nutritional and husbandry technologies and supply chain

technologies. But a strong and collective approach to productivity and a focus on strong science and industry adoption over the next 20 years will make Australia a much more competitive seafood industry.

Consumption

The commercial sector incorporating wild catch fishing and aquaculture, is Australia's fifth largest food producing primary industry, ranked by farm gate/portside values. While the industry has attractive and nutritious natural products it faces strong competition in the race to attract modern consumers.

Figure 11. Domestic Food Consumption Trends



Australian seafood consumers are demanding products (Seafood CRC, 2009) that are more easily prepared, attractive to the eye, better tasting and are more convenient for their time-poor lifestyles. Fundamentally, they want to purchase healthy Australian seafood that does not exploit producers, and respects social and environmental values. Food freshness is more important than the production source (wild or aquaculture). They are prepared to pay higher prices where these fundamental values are assured. Increasingly consumers are looking to purchase minimally transformed food in order to capture its full nutritional benefits. Consumers are consistently purchasing familiar species, so any future growth in consumption must address consumers' anxiety regarding new species offerings. Australian fish is generally considered expensive relative to other nutritional offerings, especially when purchasing for a family at the most common seafood sales point — a supermarket.

In quantitative terms, Australian seafood consumption trends indicate a growing gap between domestic seafood supply and demand similar to that indicated in overseas markets. The shortfall with a 2020 Australian population of 22.5 million is forecast to be 166,000 tonnes and with a 2050 population of 25 million to be 225,000 tonnes (Kearney, Foran, Poldy, & Lowe, 2003).

Production and trade

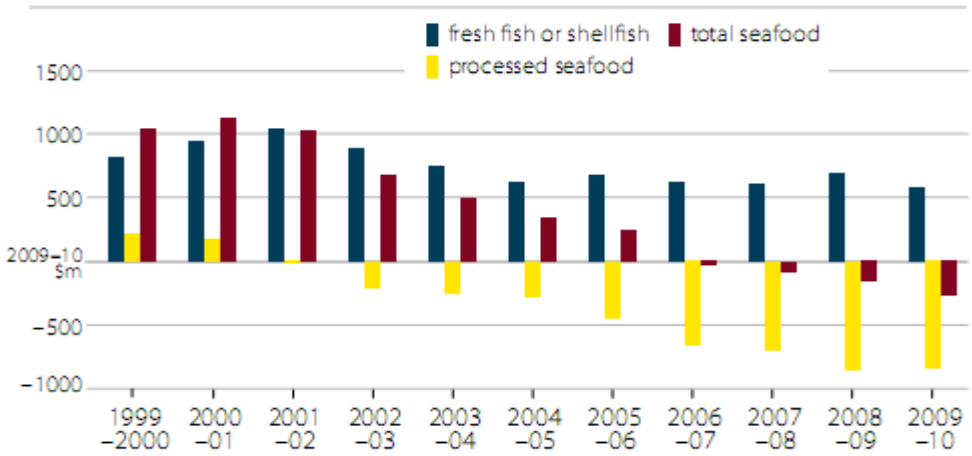
> ***Key fact***
>
> A significant proportion of Australia's seafood trade occurs with the nation's South-east Asian trading partners, where the affluence of the growing middle class will further increase demand.

Australia's fishing and aquaculture businesses produced commercial seafood with a beach valued of $2.2 billion in 2010. The catch is dominated by high-value low volume species. In 2007–08 (FRDC, 2009, p. 68) the top 7 species by value (Rocklobster, Salmonids, Prawns, Tuna, Abalone, Pearly Oysters, and Edible Oysters) dominated Australian production and export trade. These species comprised 73% of the total value harvested (edible and inedible), 64% of the wild-catch fishery

harvest value, and 87% of the aquaculture harvest value. Of this top group, one species is a wild-catch species only, 3 are aquaculture only, and 3 are sourced from both production systems.

In the last 4 years Australia has become a net seafood importer in value terms. The value of exports of fresh fish has been overtaken by imports of processed seafood, driven by domestic consumers' demand for processed seafood underpinned by a strong currency (Food Stats 2010, p. 16).

Figure 12. Australian Seafood Trade Flows



Imported seafood will continue to depress returns for local producers as long as the currency remains relatively strong and productivity gains are not captured through scale and innovation.

Australia's top 6 seafood export markets received 92% of total Australian value exported in the three years 2007–10 (AQIS Seafood Ministerial Task Force, 2011).

Figure 13. Key Export Markets for Australian Seafood

Rank	Export Market	Export Value 2007–10	Cumul. Share 2007–10
1	Hong Kong	$1,567,586,778	49%
2	Japan	$846,258,977	75%
3	USA	$187,726,967	81%
4	Taiwan	$131,088,388	85%
5	Singapore	$121,666,101	89%
6	China	$99,480,690	92%

In the last decade the strong $A has had a direct and adverse impact on seafood exports, and competitiveness against imports. Since 2004 each of Australia's key seafood trade currencies has weakened against the $A: $US — weaker by 52%; Euro — weaker by 26%; $NZ — weaker by 23%; and Japanese Yen — weaker by 9%.

Australians consume around 17.5 kg of seafood per capita annually. Domestic consumers of edible seafood are highly and increasingly reliant on imported products, especially processed products. In 2010, 75% of imported seafood volume came from the 5 leading sources — Thailand (32%), New Zealand (16%), Vietnam (13%), China (12%), and USA (3%). For the top 4 product categories by

customs code, 20% of imported volume was in prepared and preserved tuna, 17% in frozen fish fillets, 7% in prepared and preserved shrimp, and 7% in frozen or prepared squid.

Domestic distribution channels for fresh seafood are highly complex due to species diversity and the harvest sources. Wholesalers play an important "gate keeper" role in directing supply to retailers. Fresh seafood retail is dominated by fish mongers at around 40% and supermarkets with around 17% of retail sales. (DAFF, 2007, p. 46) Distribution channels for processed seafood are far less complex than for fresh seafood. As a result processed seafood is far more concentrated at the retail end of the chain – 87% of canned product and 25% of portion products are sold through supermarkets.

B. RECREATIONAL AND INDIGENOUS

> ***Key fact***
>
> Fishing for food is an important element of the aspirations of people who fish recreationally or in accordance with their customary practices.

Fishing for recreation and as part of customary beliefs both make significant contributions to the financial and social welfare of many Australian communities.

RECREATIONAL FISHING

Recreational fishing is a large industry and a big business. About 3.4 million people fish recreationally each year, spending about $665 million on tackle alone (NRIFS, 2003) (Dominion Consulting, 2005). Surveys have shown that more than 90% of recreational fishers identified relaxation as an important reason for recreational fishing. Further, 61% identified catching fish for food as an important reason for their activity. Extrapolated to the total recreational fishing population, this equates to more than 2 million Australian adults and children targeting fish to eat.

In 2009 an industry study (Ernst & Young, 2009) estimated the average expenditure per Victorian fisher to be in the order of $3,000. Even a conservative view (i.e. the national average per capita expenditure is 50% of the Victorian average) suggests that the national direct expenditure by the 3.4 million recreational fishers is in the order of $5.1 billion annually.

INDIGENOUS FISHING

Aboriginal and Torres Strait Islander fishers (Aboriginal Fishing Strategy Working Group, May 2003) catch fish for commercial, recreational or customary reasons. By custom they fish to satisfy personal, domestic, ceremonial, educational or non-commercial needs associated with their indigenous communities. Access to local seafood reduces reliance on store-bought food, providing significant economic benefit.

An estimated 37,000 Aboriginal and Torres Strait Islander people (NRIFS, 2003), mostly based in northern Australia, fish customarily at least once per year in waters near coastal marine shores (70% of effort), or in rivers and lakes (28% of effort), or offshore (2% of effort). They harvest about 2.9 million fish (1,500 tonnes) annually for their consumption. It is clear from this data that seafood makes a significant nutritional contribution to their health, especially in the Torres Strait and other northern Australian communities where this catch is concentrated. In these remote locations access to seafood is critical, since regular supply of fruit and vegetables is not a realistic option.

C. MICROALGAE FOR BIOFUELS AND FEED SUPPLEMENTS

Key fact

Utilising Australia's non-arable land and non-potable water resources for the production of micro-algae for bio-energy will reduce pressures on valuable land that is more suitable for food production.

Microalgae offer great potential for exploitation within Australian aquaculture. Microalgae are much more efficient "photosynthesis-converters" of solar energy than any known terrestrial plant (SARDI, 2011).

Attractive product streams from algal feedstocks will likely include the production of biodiesel, omega-3 fatty acids, pharmaceuticals (Austasia Aquaculture, 2011) and animal feed supplements.

There are currently a number of small scale production plants around the world primarily for human nutritional products and live aquaculture feeds (Benemann, 2008). Total world production of dry algal biomass for these algae is estimated at about 10,000 tons per year. About half of this production takes place in mainland China, with most of the rest in Japan, Taiwan, USA, Australia and India, and a few small producers in some other countries.

BIOFUELS

The commercial production of biodiesel from second generation algae feedstocks has been a recent area of considerable interest (Scott, et al., 2010, 21:277-286). Feedstock prices are the single largest component of biodiesel production (Bott, K; Nayar, S; SARDI, 2008) and therefore determine process viability. Algae have higher productivities than land plants — some species having doubling times of only a few hours, while others can accumulate very large amounts of triacylglycerides, the major feedstock for biodiesel production. Compared with other forms of renewable energy (e.g. wind, tidal, and solar) liquid biofuels also allow solar energy to be stored or used directly in existing engines and transport infrastructure.

FEED SUPPLEMENTS

The use of microalgae for human and animal feed started in the early 1970s. The largest current application of microalgae feeds is in aquaculture (including Salmonidae, Sparidae, and juveniles of prawns, mussels, oysters, pipis and scallops). Other emerging feed supplement markets include husbandry (poultry, cattle, pigs); companion animals (dogs, cats, birds, tropical fish), race horses, zoos and aquaria (Microalgae in feeds, 2010).

Australia's largest ethanol producer, Manildra Group, has recently diversified into algal oil trial production ventures to service the Chinese market (Algae Business, 2011). China has established algae oil production to meet its domestic demand for high-end chemicals and nutraceuticals, fertilizers and foods. Chinese consumers eat seventy species of algae, including the highly prized fat choy, a dark, silky, strand resembling fine vermicelli. Algae-based oils have long rivalled fish oil as health supplements in China. Chinese companies already produce health oils and algae powders (used in consumer products such as infant formula) for a global market estimated to be valued at around US$10 billion (Austasia Aquaculture, 2011).

As well as use as a feed supplement for marine, freshwater and terrestrial stock, algae also command significant markets as a feedstock in the fertilizer industry.

Outlook

High quality agricultural land is not required to grow algal biomass, and therefore there is minimal impact on the efficiency or prices of current agrifood production systems. Algal production systems could use non-arable land and saline ground water in remote locations to grow microalgae in poor quality saline or eutrophic water sources.

Figure 14. SARDI Aquatic Sciences: the NCRIS Photobioreactor Facility

However, several challenges need to be tackled to allow commercial production of diesel and feed supplements from algae at a commercial scale. Many industry leaders (Milledge, 2010) agree that algal cultivation offers great potential but they also admit it may only be viable if it broadens its scope to service a number of markets including high-value co-products: biofuels, nutra-ceuticals, fertilizers and the energy production from algal biomass waste. Research into algae-made biofuels has been particularly active (Reuters, 2011) in the last 3 to 5 years, but the European Algae Biomass Association caution that it will take another 10 to 15 years to turn laboratory experiments into industrial-scale production.

3. ANSWERS TO QUESTIONS POSED BY THE DRAFT NATIONAL FOOD PLAN ISSUES PAPER

1. WHAT IS THE MOST IMPORTANT THING YOU THINK A NATIONAL FOOD PLAN SHOULD TRY TO ACHIEVE?

The plan should maximise the continuing development of a robust national food industry and the reputation of Australian food as being produced from sustainable, well-managed resources.

For the seafood industry, the plan should provide a framework to expand the aquaculture sector and improve the profitability of the commercial wild-catch sector.

2. WHAT DO YOU THINK THE VISION AND OBJECTIVES FOR A NATIONAL FOOD PLAN SHOULD BE?

Vision

The Australian food industry is economically, environmentally and socially sustainable and internationally competitive, and contributes substantially to global food security, so that Australian consumers have secure access to high-quality, locally produced food and Australia is the "food bowl for Asia".

Objectives

- Maximise the value and volume of production and trade.
- Maximise food security and nutrition, for Australia and the world.
- Produce a range of high-quality foods to support dining experiences that both Australians and tourists value highly.
- Maximise investment in the research, development and extension framework, especially to address issues subject to market failure.
- Minimise the dollar and time costs associated with regulatory and policy processes.
- Maximise employment.
- Maximise the social benefits of the industry.

3. WHAT DO YOU SEE AS THE MAJOR RISKS TO AUSTRALIA'S FOOD SUPPLY IN THE COMING YEARS AND DECADES? HOW COULD THEY BE AVOIDED OR MANAGED MORE EFFECTIVELY?

Risks mainly beyond the influence of the food industry

- Parity of the Australian dollar.
- Cost of fuel.
- Climate change.
- Lack of a national approach to ensuring food security.
- The fact that it is not possible to supply all fresh seafood from domestic resources: whereas the over-all availability of domestically produced fresh food of all types is currently 98%, the figure is only 72% for seafood (Ruello, 2011).
- Access to finance.

Risks on which the food industry has influence

- Access to labour supplies.
- The perishable nature of food and the resulting levels of wastage in the supply chain.
- Reduced state investment in primary industries.
- Impediments to competition resulting from a high-cost regulatory environment.
- Biosecurity risks.
- Affordability of food to Australian and overseas consumers.
- Animal welfare issues.
- Lack of a competitive food (especially seafood) processing sector.

RISKS PECULIAR TO THE SEAFOOD INDUSTRY

- Bottlenecks in planning and approval that currently prevent aquaculture from achieving its potential in Australia.

  These can be avoided or managed more effectively by implementing balanced planning and assessment processes for new aquaculture developments, harmonised between the states, that do not set acceptable levels of impact so low that development is precluded.

- Weak rights of access to wild-catch fishing and aquaculture resources.

  These can be avoided or managed more effectively by improving rights-based fisheries management.

- Poor public perceptions of the wild-catch and aquaculture sectors.

  These can be avoided or managed more effectively by establishing environmental standards for fisheries that can be used to demonstrate achievement against them; and in turn, industry investment in promotion of its sectors to address negative perceptions in the community.

- Biosecurity risks: for example, Abalone Viral Ganglio-neuritis and Pacific Oyster Mortality Syndrome.

  These can be avoided or managed more effectively by investing in preventive technologies and processes that maximise Australia's biosecurity and in rapid responses in the event of outbreaks.

- Affordability of seafood to Australian and overseas consumers.

  This can be avoided or managed more effectively by increasing the supply of Australian seafood through aquaculture and wild-catch resources.

- Public concerns about animal welfare.

  This can be avoided or managed more effectively by addressing consumers' concerns through pursuit of best-practice handling — not only in the commercial sector but also in recreational fishing.

- Lack of a competitive seafood processing sector.

  This can be avoided or managed more effectively by capitalising on Australia's technological advantages and science capabilities, and by encouraging regional investment.

4. *What does food security mean to you? How would this be achieved? How would we know if/when we are food secure?*

We have used the FAO definition of food security, with which we agree.

In the face of envisaged future scenarios, it would be morally reprehensible for Australia not to produce food for the world. However, the ability of food producers to continue to produce is quite vulnerable. The social contract between food producers and consumers is therefore highly important in achieving food security. Public policy needs to foster it.

Currently, Australia's supply of seafood harvested commercially is not very secure, given the seafood industry's relatively weak rights of access to resources and its high economic vulnerability. Food security in relation to seafood is closely correlated to access to the natural resources on which the industry depends. Therefore, the nature of access to food-producing areas for seafood production and other purposes is crucial. A related requirement is to greatly increase engagement with consumers who live in urban areas to make them more aware of factors underpinning their food security.

Whereas increased food security for the wild-catch sector will flow from allocating strong, secure rights to fisheries resources, for the aquaculture sector it will flow from allowing development to occur with an acceptable level of impact that is not set at such a low level of risk that development is precluded.

A concern is that if present policies continue unmoderated, fewer consumers will be able to afford Australian seafood. (Ruello, 2005), (Ruello, 2000), (Ruello, 1999)

From the perspective of commercial fishing and aquaculture, security of supply ensues from recognition that that fishing and aquaculture play a pre-eminent part in providing food to the 96 per cent of Australians who prefer to purchase their seafood.

To Aboriginal and Torres Strait Islander fishers for whom fishing is a vital customary activity, food security equates with continuing the recent improvements in their rights to access to traditional fishing areas.

A similar equation exists for recreational fishers.

In terms of the security of nutritional values in seafood, not all seafood provides the best nutrition — local finfish generally being the best source.

5. *What are the most important benefits that Australian consumers get or should get from our food supply? Why?*

The most important benefit from seafood for Australian consumers is health benefit. Research in recent years has shown an extraordinary extent of health benefits from consuming seafood, with significant consequences for costs to the community in health care and aged care.

"Food experiences" are becoming a more important element in consumption. Australians want to enjoy the immense variety of Australian seafood in high-quality dining. This is a particularly important attraction to tourists from overseas, bringing significant flow-on economic benefits.

Benefits to Australian consumers are underpinned by access to safe, healthy, affordable food with a dependable supply.

6. *What two or three actions would most benefit food consumers?*

– BY THE GOVERNMENT SECTOR

Considerable benefit should accrue from increased policy emphasis and planning around food production (a likely outcome of the National Food Plan), reinforced by agreement on the part of all states and territories.

Expansion of labelling of seafood by country of origin to all outlets for seafood consumption, rather than only retail points of sale as at present, would benefit Australian seafood consumers.

– BY THE NON-GOVERNMENT SECTOR

Industry efforts to increase the processing of seafood in Australia would increase health benefits to consumers and help to make Australian seafood more affordable.

Closer collaboration between the seafood industry and NGOs and certifiers to demonstrate and accredit the industry's performance would increase consumers' confidence in the nutrition and safety of Australian seafood and in industry's environmental management.

Since high omega-3 content is a characteristic of much Australian seafood, health benefits are maximised by maximising the proportion of domestically produced seafood consumed by Australians.

7. *What do you see as the major opportunities for Australia's food industry in the coming years and decades? How could they be realised?*

A major opportunity for the seafood industry exists in expansion of the scope of RD&E to encompass not only the production sector but the entire seafood supply chain through to the consumer. RD&E also needs to facilitate trade and market access and facilitate promotion and marketing of seafood products in the face of longstanding market failure. Currently the focus of the enabling legislation on the "production end" of the supply chain limits incentives for the post-harvest sector to contribute to — hence benefit from — RD&E. The Fisheries Research and Development Corporation is well positioned to expand its scope in the required directions.

The potential for RD&E to implement the objectives of the National Food Plan is considerable.

Additionally, RD&E on the impacts of climate change is likely to identify new opportunities on which to capitalise.

Both the commercial wild-catch and aquaculture sectors need to take advantage of increasing demand for seafood, especially in Asia, by increasing production.

For the seafood industry, a major opportunity would be realised by amending the FRDC's enabling legislation, the PIERD Act, to enable the facilitation of seafood promotion and marketing.

Harmonising regulatory frameworks between the states and reducing costs of regulation where possible also presents a major opportunity.

A further important opportunity exists in developing a comprehensive brand around Australian seafood, within which regional brands can flourish.

Government needs to ensure that "Product of Australia" equates with the highest standards.

Opportunities exist also in the seafood industry promoting its sustainability to the community and its product quality to consumers.

8. *What two or three actions would most benefit businesses that make, distribute and sell food:*

– BY THE GOVERNMENT SECTOR?

Harmonising of federal and state legislation and regulations would remove barriers to business efficiency, which have been shown by FRDC research to be a significant constraint on industry expansion an profitability.

The Productivity Commission recently concluded that research is fundamental to maximising productivity and competitiveness, and needs to be expanded. Additional industry and government funds to expand investment in the whole post-harvest food supply area (including importers) and in marketing and promotion will be highly beneficial for the robustness of the industry. More work on chains of custody, back to the sources of production, is also needed. By increasing its partnerships through the supply chain and through other food sectors, the FRDC will be able to deliver better research outcomes.

– BY THE NON-GOVERNMENT SECTORS?

Stronger, unified peak bodies, which have been elusive in the seafood industry, would ensure policy relating to seafood is of the highest standard if they operated along the entire supply chain.

Increasing innovation (and the spread of implementation of the results) is vital for the prosperity of the seafood industry. Participating in relevant RD&E and embracing technologies (e.g. improved packaging) will continue to benefit the industry.

Achieving common areas of understanding with NGOs, major retailers and seafood importers will also pay dividends.

9. *What specific food policy and regulatory functions within or between governments overlap, are at cross-purposes or have gaps?*

[No comment is submitted for this question.]

10. *Which regulation or regulatory regime poses the greatest burden on the food industry along the food supply chain (production, processing/manufacturing, transport and logistics, wholesale, retail)? What could be done to reduce this burden?*

Impediments to trade and market access impose a great burden on the seafood industry. The industry needs to continue to work with its industry development arm, Seafood Services Australia, to foster the development of free trade policy to the advantage of Australia, building on the recent successes of a new trade and market access forum for industry and government.

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