

Supply chains and climate change

Aquaculture prawn

| Number 6

Supply chains represent the different components of the food production system from capture to consumption. To date, most climate change research on fisheries has been on the capture stage – the fishers. As climate change has the potential to impact on many components of the supply chain, opportunities for efficiencies and adaption may occur at different points along the supply chain. This project considered a number of Australian fishery and aquaculture sectors, to identify opportunities for increasing resilience to climate change, including development of adaptation options. The project defined supply chains and used them as a basis for identifying critical components and environmental footprints. Investigation of market conditions along with scenario analysis with stakeholders revealed additional options. These adaption options and efficiency suggestions can be implemented by supply chain actors, or by policy and management agencies.



The Australian prawn industry is primarily located in North Queensland between Ayr and Port Douglas. Other areas in include the Gold Coast, Sunshine coast, Bundaberg, Mackay (QLD), Ballina and Coffs Harbour (NSW). The main species farmed in Australia is the black tiger

prawns (*Penaeus monodon*). Other species farmed include the highly valued Kuruma prawns (*P. japonicus*) and Banana prawns (*P. merguensis*). Aquaculture prawns accounted for six percent of the total value of Australian aquaculture production in 2010-2011 (Skirtun *et al*).

Critical elements in the supply chain

The SCI provides one way of identifying critical elements based on large throughput rates and greater connectivity, but doesn't consider all factors such as economic efficiency or risk of being perturbed.

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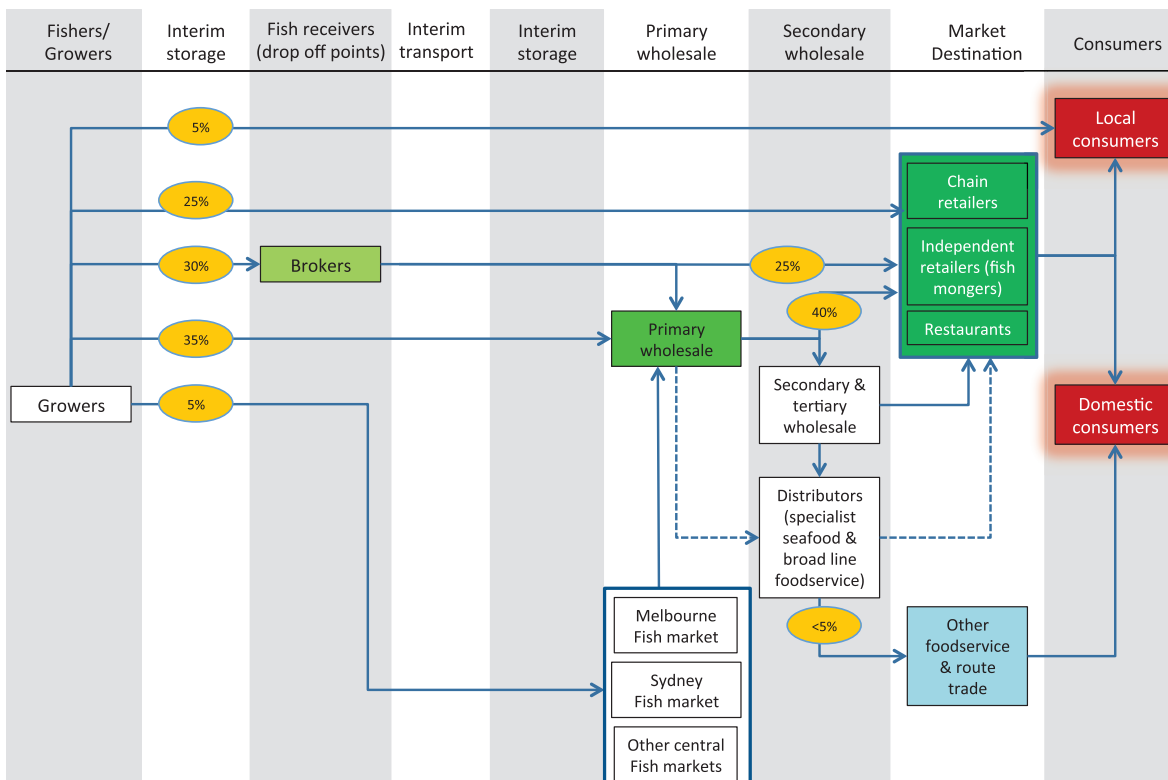


FIGURE 1 Aquaculture prawn supply chain, showing the relative flow of product with colour coding to highlight critical elements. Individual Supply Chain Index (SCI) scores for each element in the supply chains are coloured when they represent 1% or more of the total score. From highest to lowest scores, the colour coding used is red (>20%)-orange-green-blue-purple. Additional highlights to the red and orange boxes emphasize the critical elements. The supply chain components are based on common templates used for consistency for all fisheries considered in this project.



The Australian aquaculture prawn supply chain differed from the other fisheries studied in that there was a single dominant key element, namely the domestic consumers. Hence attempts to increase the diversification (if not already the case) of the domestic consumer market will improve the stability of this supply chain.

Market analyses

Market analyses consider the relationships between domestic and international markets, volume of product and price and completion from other producers.

The main market analyses results for aquaculture prawns show:

- ♦ A co-integration between Australian wild and farmed prawns and prawn import prices. Analysis suggests that while imports will depress the price received by Australian prawns it will not be necessarily the other way around;
- ♦ Imported prawns are of lower value than Australian prawns;
- ♦ Changes in food expenditure per capita have the biggest effect on Australian prawn prices;

- ♦ The increase in prawn imports was found to potentially cause a bigger reduction in Australian prawn prices than if their own quantities were to increase in the market;
- ♦ The increase in exchange rate has pushed higher valued wild prawns that were previously exported into the domestic market.

Future adaptation options

Three potential future scenarios based on literature reviews, expert opinion, stakeholder interviews and related projects were presented to stakeholders.

Scenario one

Potential supply change

> Increased flooding regimes with a net increase of suitable aquaculture habitat.

> Increase in extreme events (cyclone, flooding, heat and frequency and/or nature/type of diseases) affecting ponds and prawns.

Scenario two

Potential demand change

> Increase competition as a result of cheaper imports & higher supply from wild-caught banana prawns.

The adaptation options and stakeholder interviews showed that:

- ♦ Sea level rise along the Queensland coast is expected to result to some areas of agricultural land becoming marginalised, especially where sugar cane is grown. This is seen as an opportunity by some to potentially expand aquaculture in such areas;
- ♦ An increase in extreme events affecting areas where prawns are farmed and distributed is seen by some stakeholders as a concern. The primary concerns are a disruption in power supply, affecting pond operation and on-farm cold storage, as well as a disruption of transport routes, which can impact on the inbound flow of farm supplies (feed, fuel) and outbound flow of product to markets.



Reference

Skirtun M, Sahlqvist P, Curtotti R and Hobsbawn P (2012) ABARES 2012, Australian fisheries statistics 2011, Canberra, December. CC BY 3.0.

FURTHER INFORMATION

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