Supply chains and climate change

Commonwealth Trawl Sector

Number 4

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 Commonwealth Trawl Sector (CTS) is one of four sectors in the Southern and Eastern Scalefish and Shark Fishery (SESSF). It covers the area extending southward from Barranjoey Point (NSW), around the coastlines of NSW, Victoria, Tasmania to Cape Jervis in South Australia. The CTS is the largest sector in terms of catch and value and is one of Australia's oldest commercial fishing sectors. There are four principal species caught in the Commonwealth Trawl Sector: Blue Grenadier (*Macruronus novaezelandiae*), Tiger Flathead (*Platycephalus richardsoni*), Pink Ling (*Genypterus blacodes*) and Silver Warehou (*Seriolella punctata*).

Commonwealth Trawl Sector (CTS)

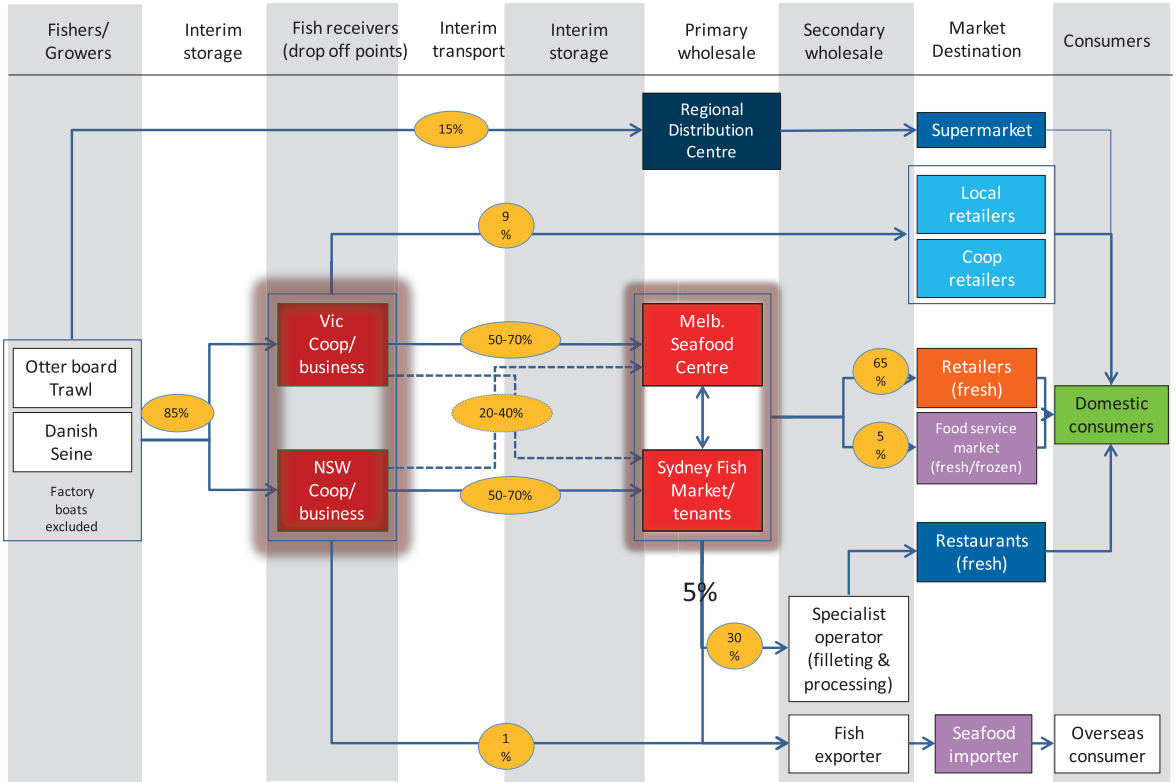

FIGURE 1 **CTS supply chain, showing the relative flow of product with colour coding to highlight critical elements. Individual Supply Chain Index (SCI) scores for each element in the supply chains are coloured when they represent 1% or more of the total score. From highest to lowest scores, the colour 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.**

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.

The critical elements identified for the CTS are:

- Victorian and New South Wales co-operative businesses;
- Melbourne and Sydney fish markets;
- Fresh fish retailers.

Environmental footprint for the supply chain

Life cycle assessment (LCA) takes into account the environmental footprint of the supply chain. It includes the environmental consequences of the inputs such as the production of the fishing gear, the production of fuel and transportation.

The main LCA components for CTS are:

- Global warming potential – trawl fishing contributes more to global warming than Danish seine at the capture stage, while the electricity used for ice production, cool rooms, lighting and office administration are the biggest contributors at the processing stage;
- Cumulative energy demand – electricity and transport are the major contributors here after the capture stage;
- Water use – the production of fishing nets, ice and diesel are the major users of water in the capture phase, while the production of ice, handling/cleaning are the major users of water in the processing stage.

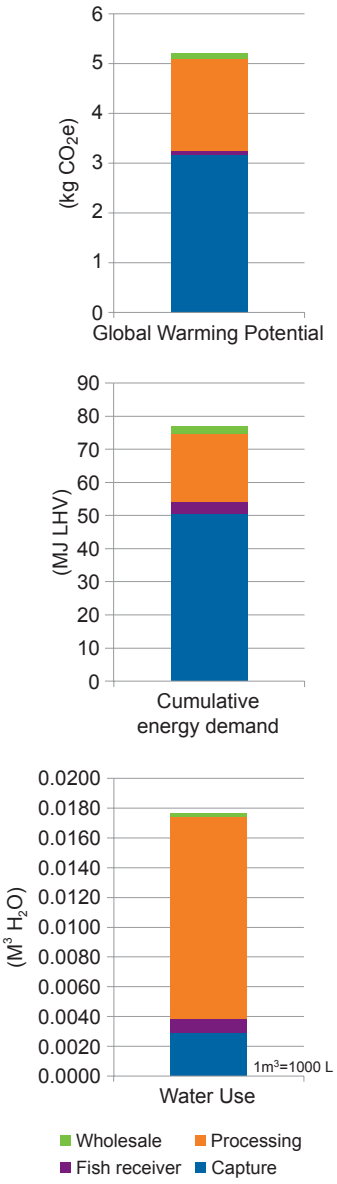

FIGURE 2 **Contribution by category to the life cycle impacts of 1 kg whole fresh fish from the CTS at wholesale.**

Future adaptation options

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

Scenario one
Potential supply change

> A gradual change in the distribution of key species to the south as a result of warming eastern Australia waters.

Scenario two
Potential demand change

> Increased supply of similar seafood from international markets, from other areas less affected by climate change, leads to increase competition in the domestic markets.

The adaptation options and stakeholder interviews showed that:

- The supply led nature of this supply chain suggests it may be more vulnerable to climate change than other fisheries looked at;
- Long term increases in efficiency may occur as a result of fleet and logistic movements south, but an increased environmental footprint is expected in the short term in response to changing fish distributions;
- A smaller fleet could in fact result in a higher CPUE as fewer boats will be competing to catch the fish. Should this be the case fishery fuel use will fall and lead to a smaller footprint per kilo of fish caught at the capture phase in the CTS.

FURTHER INFORMATION

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