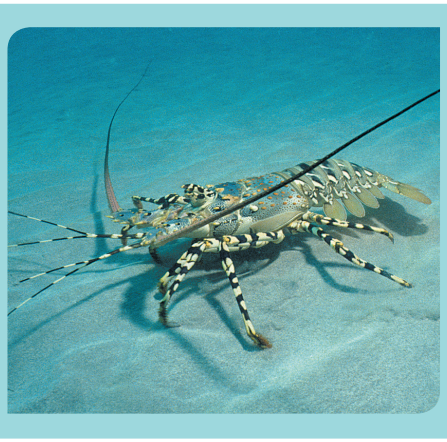
Supply chains and climate change

Tropical Rock Lobster (Torres Strait Fishery)

Number 3

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 Torres Strait Tropical Rock Lobster (*Panulirus ornatus*) fishery extends from the tip of Cape York to the northern border of the Torres Strait Protected Zone. It is part of the Commonwealth fisheries and is currently the largest commercial fishery in the Torres Strait in terms of catch (704 tonnes in 2010-11) and value (estimated to be $24 million in 2010-11).

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 element identified for the TRL is:

- The US and Chinese markets – the need to reduce uncertainty in supplying

Torres Strait Tropical Rock Lobster (TRL)

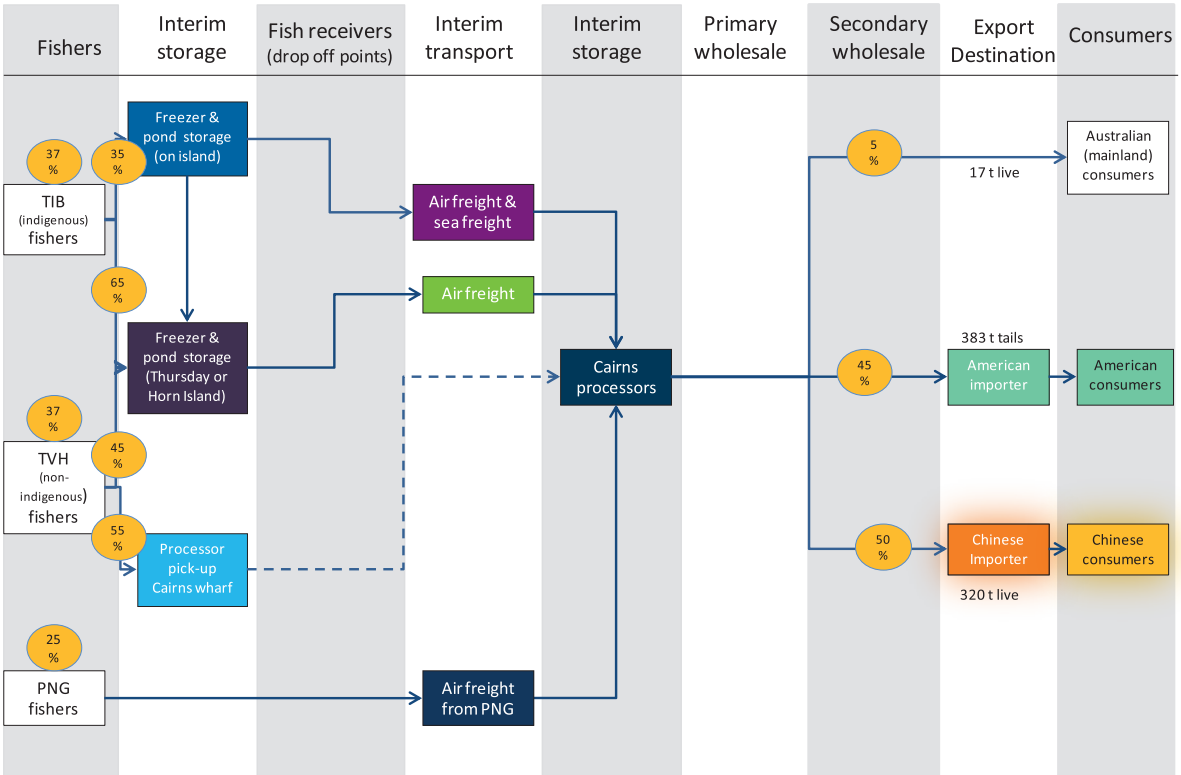


FIGURE 1 **TRL supply chain, showing the relative flow of product with colour coding to highlight critical elements. Individual Supply Chain Index (SCI) scores for each element in the supply chains are coloured when they represent 1% or more of the total score. From highest to lowest scores, the colour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

these markets by strengthening and maintaining relationships.

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 TRL fishery has a total of five fisher typologies based on fisher type, fishing activity and freight and market destination. The main LCA component of TRL (total catch) is:

- Global warming potential – greatest in the export phase and lowest in the processing phase with different contributions depending on the fisher type.

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 TRL show:

- Based on demand analysis, the TRL product is seen to be interchangeable with other Australian rock lobster species by the Hong Kong market and while specific prices vary between species, increases and decreases in prices are expected to follow similar trends;
- The US market for tails, while an important market, is unlikely to absorb the extra product from the live market if the live market declines.

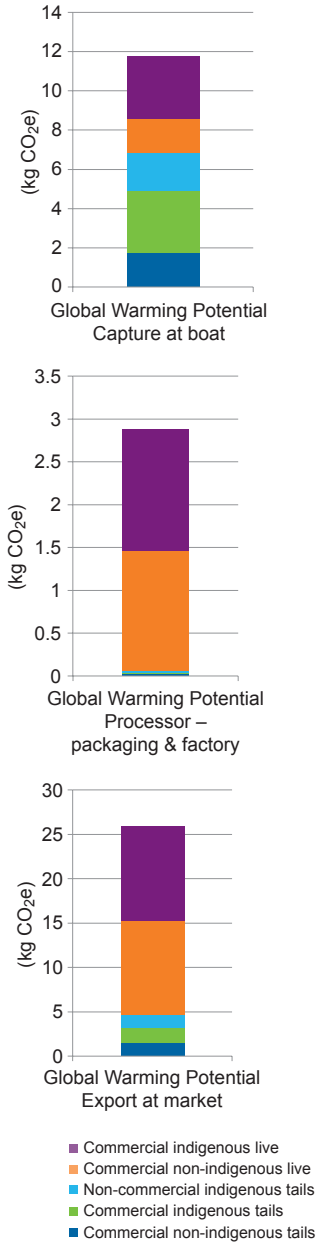


FIGURE 2 **Global warming potential (kg CO_2e per kg lobster) for five fisher-types in the tropical rock lobster fishery.**

Future adaptation options

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

Scenario one
Potential supply change

> Small islands are impacted by sea level rise consequently shifting islander population. Fishers will have to travel further to reach the previous catching grounds causing higher travel costs to islander fishers. The overall effects will be decreased supply due to lower catches from previous grounds (due to increase fishing cost) and lower catches from closer grounds due to localised depletion).

Scenario two
Potential demand change

> Increased international competition due to change in geographical spread of production with PNG increasing production (wild catch). Overall there is increased international competition from both non-Australian wild and farmed product increasing quantities available and reducing average prices.

The adaptation options and stakeholder interviews showed that:

- Given the relatively small area in the Torres Strait, the non-traditional inhabitant fishers are seen to be minimally impacted by an increase in sea levels, given that they have the infrastructure to travel further (larger boats);
- Traditional inhabitant fishers may be highly impacted by this change, as they often do not have the infrastructure and processes to engage in fishing further distances.

FURTHER INFORMATION

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