

Adaptive Value Chains Case Study

Calypso™ Mangoes

The impacts of climate change are felt along the whole chain of businesses that produce, handle, process and market agri-food products. Whilst there is this growing level of concern about impacts on chains, there is still minimal guidance for companies to understand and act on this risk. Featuring insights from value chain analysis, consumer research and carbon and water footprint assessment, this case study illustrates how companies can consider climate change impacts and adaptation across the value chain.

The Calypso™ Value Chain

The Harvest Markets Pty Ltd Calypso™ mango chain produced and supplied approx. 40% of one of Australia’s premium mango varieties via road and rail. It is one of the longest value chains in the nation with fresh product travelling up to 4500 km from farm gate to market. The chain is largely vertically integrated with strategic alliances with service providers and marketers throughout the chain. The company’s stringent production and marketing protocols provide process compliance benchmarks for all staff and service providers. Harvest’s management of these protocols provide them with a strategic advantage over competitors, enabling them to command a premium price for their products.

Impacts and adaptation along the chain

The majority of climate and weather risks for this chain were at the mango growing stage, as this activity is the most exposed to the natural environment. However, other more indirect climate impacts were also felt across the chain (Figure 1). As a fast moving fresh product, any impact felt at the farming end is likely to translate to a deterioration in quality at the consumer end. This risk provides Harvest with a strong imperative to adapt. However, the current adaptation strategies along the chain are currently autonomous – changes made are not necessarily designed to address a climate risk directly. Such adaptation action, while addressing risk at one stage of the chain, could pose challenges to another if not carefully considered from a whole-of-chain perspective.

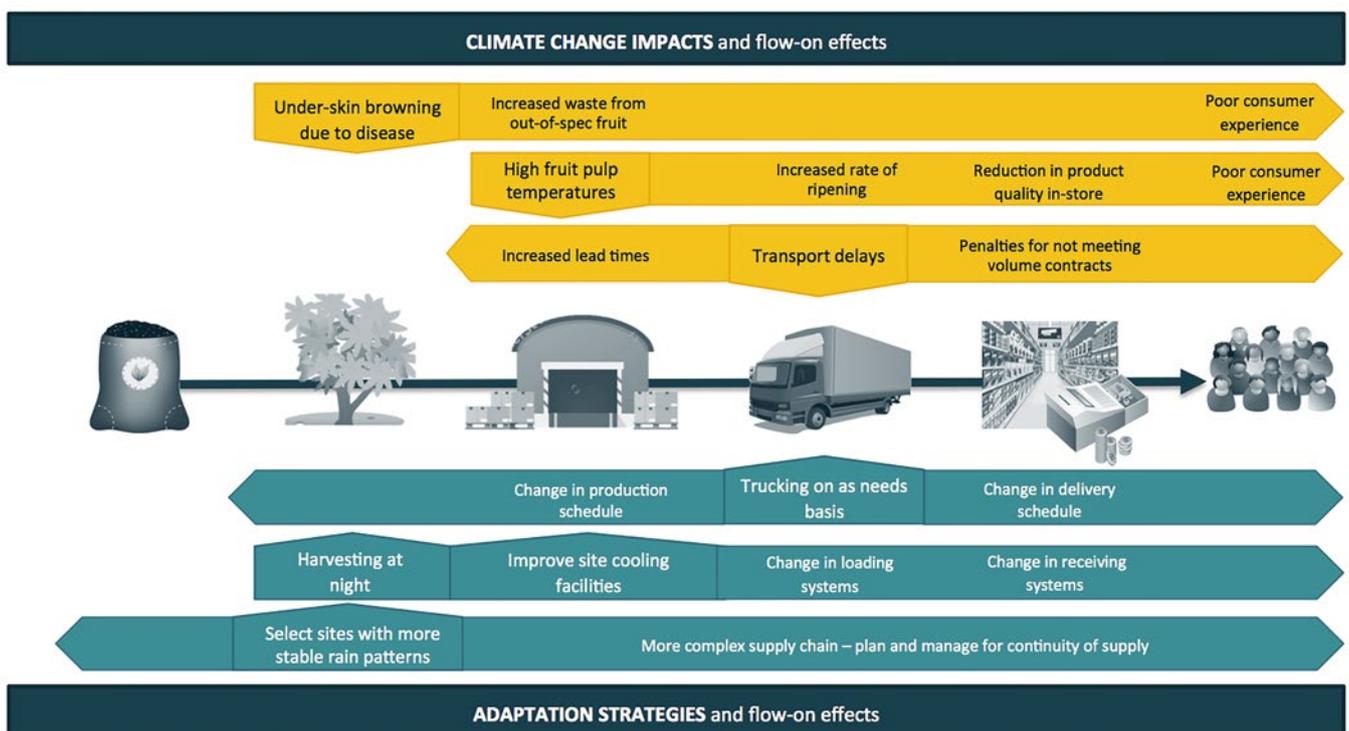


FIGURE 1

Examples of how climate change impacts and adaptation along value chains can have direct, and indirect, effects on multiple stages along the chain

Consumer perspectives of adaptation¹

Consumers have the potential to drive adaptation along the chain, especially if adaptation strategies create additional value that consumers are willing to pay for. Mangoes are considered a high-value product by consumers, driven by its seasonality and use as a special occasion fruit or dessert.

In response to the potential impacts of climate change, most consumers are less likely to sacrifice quality over frequency of purchase, and some would even be willing to purchase mangoes off-season.

Consumers are also likely to support adaptation in mangoes to a greater degree than other food products if it means preserving the product attributes that they most value (i.e. freshness, taste), regardless of season. In which case, adaptation could act as a market-competitive strategy for a fresh food chain faced by the risk from climate impacts.

Carbon and water footprint assessment²

Information from carbon and water footprint assessments can help a chain understand the physical, financial and reputational risks associated with climate change and the adaptation possibilities. A screening level assessment was designed to identify 'hotspots' in the carbon and water availability footprints of Calypso™ mangoes near production centres in Darwin and Katherine, delivered to markets in Sydney and Melbourne.

The carbon footprint of Calypso™ mangoes was assessed as Category A (<1kg CO₂e per kg of product sold, Figure 3) delivered from Katherine to Sydney or Melbourne. Over half (55%) of this was determined by the transport stage of the chain, given the vast distance the product travels to major retail markets. However, the carbon footprint was sensitive to the type of transport used – road transport resulted in higher emissions compared to rail.

Consumptive water use was assessed as Category B (5 to 50L H₂Oe per kg sold, Figure 3), with orchard irrigation accounting for 98% of this volume. However, the Calypso™ orchards in the Northern Territory are located in regions that are currently regarded as having very low water stress. As such, orchard irrigation represented only 63% of the water availability footprint.

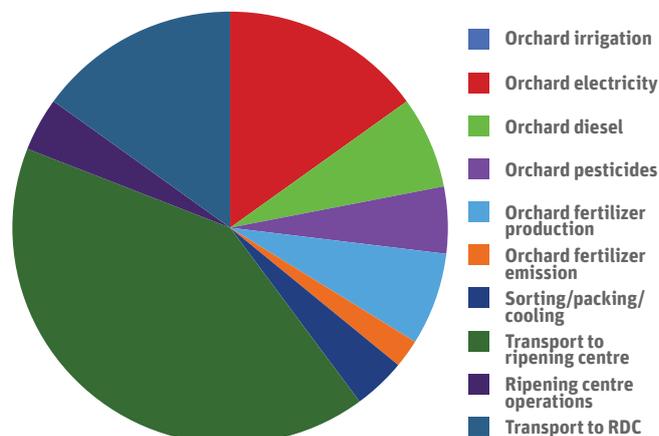


FIGURE 2

Profile of life cycle GHG emissions (CO₂e) and water footprint for Harvest Calypso™ mangoes

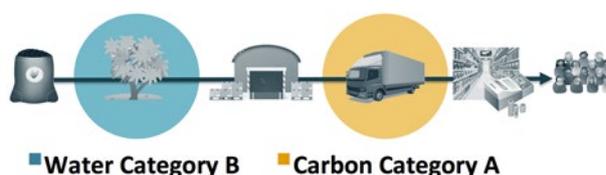


FIGURE 3

Carbon and water footprint hotspots for the Harvest Calypso™ value chain

The Harvest Calypso™ case study shows how opportunity for adaptation can come from multiple perspectives. In the case of this chain, the farming stage faces climate risk, while the consumer end indicates possible support for adaptation. Without a whole-of-chain perspective, there is a potential to lose line of sight of climate risks, as well as adaptation opportunities. Thus, development of adaptation strategies based on a greater understanding of the interplay of climate impacts and adaptation strategies across the chain would lead Harvest Markets to be in a more competitive position.

FOR FURTHER INFORMATION

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DOWNLOAD THE FULL REPORT

<https://adaptivevaluechains.org>

¹ The summary report is available on: <https://publications.csiro.au/rpr/download?pid=csiro:EP148832&dsid=DS2>

² For further information about the use of carbon and water footprint assessment for this project, and categories, see the paper 'Climate Change Adaptation Strategy in the Food Industry – Insights from Product and Carbon Footprints' on: <http://www.mdpi.com/2225-1154/4/2/26>