



Analysis

Consumer Response to Climate Adaptation Strategies in the Food Sector: An Australian Scenario

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ABSTRACT

The viability of climate adaptation strategies adopted by agrifood companies rely heavily on how well consumers understand, accept and/or select commodities and their willingness to bare some of the cost of adaptation. To understand this issue in more detail, a survey was undertaken of 1532 Australian consumers to investigate how they respond to adaptation strategies in terms of acceptance and willingness to pay. The survey results contained in this paper focus on three product categories – mango, potato chips and wine. The survey revealed that when faced with climate-adapted mango, potato chips or wine products, respondents were most likely to substitute or purchase less often rather than purchasing a more expensive ‘adapted’ product or a cheaper ‘non-adapted’ product. Across the three commodities, the level of acceptance also varied little with socio-demographic factors and the respondent’s perceptions of climate change. The study highlights the importance of communicating the climate adaptation initiatives of agrifood companies and the challenges faced by these companies in raising the awareness associated with climate-adapted product.

1. Introduction

Adaptation has been defined as any “adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative effects” (Bierbaum et al. 2014: 672). Adaptation to climate change can occur at a range of scales from incremental, to systemic through to transformational (Rickards and Howden, 2012). Incremental business adaptation is generally accepted as small improvements or adjustments in enterprises at a single node in the supply chain which maintain the essence and integrity of a system (Dowd et al., 2014; Furman et al., 2014; Kates et al., 2012; Lim-Camacho et al., 2015; Park et al., 2012; Rickards and Howden, 2012) with the view to maintain ‘status quo’. Incremental adaptations are generally small-scale, discrete responses to the impact of climate change. Although these incremental adaptations could be reactive, they may effectively decrease an enterprise’s vulnerability to climate fluctuations in the short-term, and thus have the potential to be maladaptive. Systemic adaptation refers to the adoption of a range of incremental adaptation options that serve to shift the operating system to a

new state. Systemic adaptations are more complex than incremental adaptations and lead to some system change. These changes do not necessarily transform the business and so reside somewhere between incremental and transformational adaptation.

Transformational adaptations are defined as activities that are adopted at a much larger scale or intensity, that are truly new to a particular region or resource system, and that transform geographical land use (Kates et al., 2012). They involve a major shift in the overall goals of an enterprise or supply chain (Dowd et al., 2014; Linnenluecke et al., 2011; Park et al., 2015; Rickards and Howden, 2012). The difference between incremental and transformational adaptation is therefore both a question of scale and the willingness to shift from maintaining the ‘status quo’, although the distinction between the two may not always be clear-cut (Kates et al., 2012). For enterprises to undertake transformational adaptation, a high degree of adaptive capacity is required (Dowd et al., 2014; Furman et al., 2014; Lereboullet et al., 2013; Marshall, 2010; Marshall et al., 2014, 2012; Park et al., 2012; Rickards and Howden, 2012). Transformational adaptation aims to ensure long-term viability of businesses or enterprises to a broader

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scale and is thus considered proactive rather than reactive (Dowd et al., 2014; Rickards and Howden, 2012).

Agribusiness and the food sector are becoming increasingly vulnerable to unprecedented fluctuations in climate (Fleming et al., 2014; Kates et al., 2012; Lim-Camacho et al., 2015; Rickards and Howden, 2012). As such, the need for adaptation to occur across the spectrum from incremental to transformative has been identified as crucial if the current supply and quality of food products is to be maintained (Kates et al., 2012; Rickards and Howden, 2012). However, to date, most literature published on climate adaptation in the food sector has focused on changes at the farm gate or risk to logistics (Lim-Camacho et al., 2017a; Plagányi et al., 2014). Very little research has been undertaken on the possible changes to the quality of food products and to understand the consumers' willingness to pay (WTP) for climate-adapted products despite a recent focus on the effect of consumer climate change attitudes and WTP for sustainability attributes (Greibitus and Lusk, 2013; Nauges and Wheeler, 2017; van Loo et al., 2015).

Climate adaptation in the food sector can lead to more directly noticeable benefits such as better quality produce and other benefits such as assurance of supply over a long period of time and earlier market penetration, and could completely buffer consumers from the impacts of climate change. While consumers may directly benefit from adaptation initiatives put in place by businesses in the food sector, there may also be instances where such benefits are not felt by the consumers due to lack of awareness of such initiatives. These climate adaptation initiatives are often expensive and hence understanding of consumer readiness and their willingness in accepting a climate-adapted product at a potentially elevated price is important for any food business to decide on the viability of their climate adaptation initiatives. This paper aims to provide new insights into how consumers may respond to climate adaptation initiatives of agrifood companies, by eliciting consumer responses to a number of hypothetical "climate-adapted" food products. Specifically, we analyse the consumer preferences and their responses to hypothetical adaptation initiatives and examine variances across three product categories.

2. Behavioural Responses to Adaptation in the Agrifood Sector

Kates et al.'s (2012) position that the scope of adaptation is not only technological but also encompasses a change in behaviours. This addresses how individuals and society make decisions and allocate resources to cope with climate change. However, in the case of the agrifood industry, studies on adaptation behaviour have mainly focused on enterprises particularly organisational culture and management, strategy and information-seeking practices in response to climate change (Dowd et al., 2014; Rickards and Howden, 2012). There is limited published empirical literature on how consumers respond to such adaptation strategies. The research have mainly focused on uncovering evidence of links between social norms and peoples' behaviours, intentions and motivation to environmental choice and preference (Gatersleben et al., 2014; Dermody et al., 2018; Li et al., 2016; Lim-Camacho et al., 2017b; van der Werff et al., 2013). For example, van der Werff et al. (2013) discuss the impact of environmental self-identity which deals with the concept of people acting in an environmentally friendly way without an external incentive to do so. Environmental self-identity is generated by a moral obligation to be environmentally friendly, however group influence impacts on behaviour and motivations towards climate change, as in the case of social norms. Consistent with this argument, Nyborg et al. (2016) highlight that individual's behaviour towards a broader global challenge such as climate change is impacted by social norms and relevant policies could support change of these social norms.

More closely aligned to consumer responses to climate adaptation is the growing interest in measuring consumers' WTP for food attributes in relation to environmental values such as natural, organic or local provenance which are driven and delivered by provenance strategies across

the whole food value chain (Batte et al., 2007; D'Amico et al., 2016; van der Werff et al., 2013; White and Brady, 2014). However, White and Brady (2014) argue that these environmental attributes are 'impure' or non-standard environmental attributes and the consumers WTP a premium price for such products can be masked by their motivations to purchase healthy and/or safe food products rather than paying extra for 'pure' or standard environmental attributes relating to energy or water use. This was evidenced by Li et al. (2016) that showed consumers who readily consume organic and/or locally produced beef were less supportive of environmental programs than others surveyed and were more likely to substitute products than pay a price premium for a climate-adapted product.

van der Werff et al. (2013) concluded that some consumers are inherently motivated to act in a climate-friendly manner and environmental labels could reinforce their pre-existing intrinsic motivation to contribute to climate change mitigation (Perino et al., 2014). This would suggest that labels play a crucial role in communicating environmental attributes to consumers and hence many studies focus on determining how environmental labels could influence the demand for food products (Panzone et al., 2011; Perino et al., 2014; White and Brady, 2014). Outside the growing literature on consumers' WTP for food safety provenance, organic, certifications and environmental labelling, there is little research on more subtle food product attributes that value chains are responsible for. Climate adaptation is a case in point. To address this knowledge gap, this paper examines how consumers respond to climate adaptation initiatives of agrifood companies, the establishment of hypothetical climate-adapted products.

3. Data and Methods

3.1. Survey Instrument

This paper is based on a broader research study conducted during 2013–2016 in understanding how Australian agrifood value chains are impacted by climate change and climate variability and how such chains effectively respond through adaptation and mitigation strategies. For this study, three agrifood product categories were selected to represent a fresh fruit product with a simple chain (mangoes), a processed food product with a moderately complex chain (potato chips), and a beverage product with a complex chain (wine). A questionnaire was designed based on qualitative exploratory research through four focus group discussions conducted in Brisbane, Australia, supported by literature on climate adaptation beliefs and norms (Leiserowitz et al., 2010; Leviston et al., 2013). The focus group discussions were used to gather an in-depth understanding of the product usage as well as consumers' climate change beliefs and their perceptions. Although the findings of the focus group discussions are not reported in this paper, the key themes emerging from those discussions, as well as the specific language used by consumers around the concept of adaptation, guided the questionnaire development process.

The questionnaire comprised of four broad sections: the first focused on product-specific questions that aimed to gather information on attribute preferences, usage and adaptation scenarios; the second focused respondents' general beliefs on climate change, how they live with climate change; the third focused on specified climate change and adaptation scenarios designed to highlight potential climate change impacts for each product category and two agrifood business adaptation strategies that could address the respective climate change impact and the fourth focused on their socio-demographic characteristics. The specific scenarios were developed based on in-depth consultations with value chain members identified in the broader research project and were supported by scientific evidence. All these scenarios were initially tested during the focus group discussions and the refined scenarios were populated in the survey. Questions were designed to gather how respondents would react to the situation and the amount they expect to pay for the product that resulted based on the given scenario. These

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