

## **THE FISHING INDUSTRY'S PERCEPTION OF ITS CONTRIBUTION TOWARDS THE SUSTAINABILITY OF THE EYRE PENINSULA REGION, AUSTRALIA**

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**ABSTRACT:** This study explores the fishing industry's perception of its contribution towards the sustainability of the Eyre Peninsula region. The contribution of the fishing industry to the sustainable development of the regional Eyre Peninsula is yet to be fully documented. Thematic analysis of interviews with 54 actors of the fishing industry and indirect observations reveal that three essential descriptors explain the industry's contribution towards the sustainability of the Eyre Peninsula region: (a) green conscious (b) economic pillar and (c) social buffer. The contribution of this study is threefold: It proposes conceptual and empirical models that enhance our understanding of the symbiotic relationship between industry and regional sustainability; It advances industry sustainability research from a regional perspective—the study adds fishing industry perspective to regional sustainability transition research; Finally, this study further develops the notion of regional industry sustainability through empirical evidence from the fishing industry. The implications of the findings for theory, management, policy and research are discussed.

**KEY WORDS:** Industry sustainability; regional sustainability; fishing industry; Eyre Peninsula region; Australia;

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## 1. INTRODUCTION

This paper investigates the fishing industry's perception of its contribution towards the sustainable development of the Eyre Peninsula region. Human societies now enjoy an improved standard of living and wellbeing. These improved living standards and conditions come with environmental and ecological side effects including energy inefficiencies, environmental degradation, and exploitation of biodiversity and natural ecosystems. In response, industries are currently making gradual but significant efforts to address these sustainability challenges. This persistent approach to achieving sustainability in contemporary society is known as sustainability transition (Grin *et al.*, 2010). Sustainability transition embodies the ultimate goal of sustainable development, which is to promote development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (WCED, 1987). The main concern of the sustainable development or sustainability movement is that industries must pursue economic development through sound environmental practices (WCED, 1987). In order to address this concern, industries are transforming their business models in response to sustainability issues for both present and future generations.

The ability of an industry to address the goal and concern of sustainable development by ensuring an appropriate balance between economy and environment, while protecting society, is referred to as industry sustainability (Jansson *et al.*, 2000). Exploring industry sustainability is important because industries that embrace and integrate social, economic and environmental needs are more likely to flourish for the long term (Jansson *et al.*, 2000). Industry sustainability also ensures that industries hold themselves responsible and accountable for any adverse effects of their manufacturing and production operations and management practices (Tonelli *et al.*, 2013). Despite its relevance for pursuing and achieving the goal of sustainable development, an in-depth understanding of industry sustainability may be difficult without a regional approach (Skellern *et al.*, 2017). Therefore, the value of understanding the sustainability practices of the fishing industry in the Eyre Peninsula region stems from the emergence of regions as an essential focus for understanding sustainable development (Graymore *et al.*, 2008).

Regional sustainability, also known as regional sustainable development, requires the human population to live within the limits of the region's supporting social, economic and ecological systems, and ensures equitable cross-generational sharing of resources and opportunities (Graymore,

2005). Because both industries and regions have similar development trajectories, and regions are appropriate scales for measuring and understanding the role of industries in development, exploring regional sustainability has special significance (Markusen, 1994a). The development of regions is intrinsically connected to the development of industries. Regional sustainability also provides the basis for assessing and understanding the social, economic and environmental issues that confront regions (Sharma and Kearins, 2011). Research reveals that achieving sustainable development may be impossible without industries because they have the resources, skills, and motivation to engage with more sustainable societies (Lozano, 2013). Invariably, a region can achieve sustainability by leveraging its industries and businesses in response to social, economic and environmental challenges (Potts, 2010).

The main motivation for this study is that despite the relevance of industries in promoting regional sustainability, the nature of this relationship has not been comprehensively addressed in research (Skellern *et al.*, 2017). Sustainability at the spatial level lacks industry perspective, and more pressing still is the lack of research on how the fishing industry perceives its responses to sustainability issues, especially in regional Australia. Researchers examining regional sustainability issues have mainly focused on the role of academia in sustainability (Zilahy *et al.*, 2009), developing sustainability indicators (Ramos, 2009); learning for sustainable development (Dlouhá *et al.*, 2013); educating for sustainable development (Gao *et al.*, 2006), and assessing sustainability (Wang *et al.*, 2016). Though these studies have illuminated our theoretical and empirical understanding of sustainability transition in regions, how industries contribute to sustainability requires more empirical research. Consequently, this paper seeks to address the gap in the literature by addressing an important research question: *How does the fishing industry perceive its contribution towards the sustainability of the Eyre Peninsula region?* Understanding how the industry responds to regional sustainability provides a useful opportunity to document its contribution and provide necessary management and policy support.

This study investigates a fishing industry because fishing has gradually become a significant component of the regional economy (Pierce and Robinson, 2013). Mazur *et al.* (2004) maintain that the fisheries and Eyre Peninsula region have a symbiotic relationship that spans years of socio-economic interdependency. In order to answer the research question, this paper adopts a qualitative approach. The perceptions of the actors were gathered using interviews and analysed using an inductive thematic

approach. Insights from the analysis advance regional industry sustainability by arguing that regional industries can drive sustainability transition.

## **2. SUSTAINABILITY CHALLENGES OF THE EYRE PENINSULA REGION**

Regions worldwide face sustainability challenges and those experienced in Australia are not different. Collits (2004) suggests that in many respects, the interests and aspirations of regional Australia, including the Eyre Peninsula, are no different to the rest of Australia. Eversole (2015) describes regional Australia's social, economic and environmental issues. Socially, van Putten *et al.* (2017) identify socio-economic vulnerability as one of the biggest social challenges in regional Australia. This is driven by population disparities and disadvantages in locations that favour metropolitan to non-metropolitan regions. This is a true story for coastal communities that are more vulnerable to climate-driven environmental change. More pressing social issues are access to services and service-related disadvantages, migration of youth and ageing regional populations, and sustainability pressures on traditional industries (Eversole, 2015). Other social challenges include inadequate housing, lack of employment opportunities and social and financial infrastructure, inequitable and inaccessible service delivery and weak regional pride (Charters *et al.*, 2011). Economically, Collits (2004) observes a decline of traditional industries including meat, timber and dairy, driven by a mix of global competitive pressures, environmental regulations and the demands of national competition policy. This has led to a shift in industry and occupational structure, income distribution and levels of poverty (Stimson, 2001). Environmentally, Charters *et al.* (2011) enumerate a few challenges that confront regional Australia. They argue that remote communities are particularly challenged by natural resource management issues including: water security, biodiversity conservation; self-sustaining management of resources, and management of the environmental footprint associated with agricultural practice.

Although the region faces significant sustainability issues, industries play an important role in addressing some of these issues. Various reports indicate that the contribution of fisheries to socio-economic development of the Eyre Peninsula region is enormous (EconSearch, 2015; 2016). Agriculture and fisheries are major industries that support the Eyre Peninsula region, and some industry-research clusters drive innovation and economic growth. The region also has a clean and green reputation for

agricultural commodities and an international reputation for seafood products (RDA, 2016). This provides a rich research context to explore and deeply understand regional sustainability from a fishing industry perspective.

### **3. INDUSTRY SUSTAINABILITY**

Industries, when given an opportunity, can help regions meet the needs of the present generation without diminishing long-term economic, social and environmental opportunities (Skellern *et al.*, 2017; Jansson *et al.*, 2000). Paramanathan *et al.* (2004) suggest that industries can help achieve sustainability by developing efficient technologies and supportive practices that foster environmentally, economically and socially sustainable practices. Environmentally sustainable practices ensure that the natural environment is well preserved and protected to continuously flourish (Meadowcroft, 2000). Economically sustainable practices involve achieving economic growth and development through sound environmental practices (Spangenberg, 2005). Socially sustainable practices seek to maintain and improve social wellbeing (Borrini-Feyerabend and Buchan, 1997). Since sustainable development is a dynamic process rather than a final destination (Berggren, 1999), industries can collaborate with their regions in ways that support the achievement of social, economic and environmental objectives for the future.

There are different ways for industries to promote sustainability in regions. Tonelli *et al.* (2013) recommend that industries can be transformed such that they can become part of and actively engage societies in achieving the dimensions of sustainable development. Berggren (1999) finds that industries can engage in efficient commercial and manufacturing activities where they can preserve and conserve natural resources during process to product designs. Closely related to efficient commercial and manufacturing activities is another view that industries can be sustainable if they are made to innovate processes and products that incorporate social equity, economic efficiency and environmental performance into their day-to-day practices through technological development (Arena *et al.*, 2009). The idea of natural resource efficiency reinforces the ecological view taken by Starik and Rands (1995) that, with the appropriate institutional support, industries can be ecologically sustainable. In developing this idea further, Russo (2003) maintains that ecological sustainability influences industries to have a long-term perspective such that their existence also nourishes other collective entities

at related levels and in related systems. A more recent view also suggests that industries can be encouraged to learn and acquire new sustainability mindsets (Smith, 2012). Industries can change individual and group mindsets and internal processes through learning which can remove barriers and improve progress towards sustainability (Pourdehnad and Smith, 2012). The value of industries constitutes a rich research interest to investigate how sustainable development can be achieved in regions.

#### 4. REGIONAL SUSTAINABILITY

Regions are considered the most appropriate geographical scales for promoting and studying sustainable development (Wheeler, 2009). Regions have enormous location and resource advantages in supporting economic, social and environmental development (Potts, 2010; Sharma and Kearins, 2011).

Environmentally, most regional scientists are particularly concerned about regional responses to developing a green economy (Gibbs and Lintz, 2016; Gibbs and O'Neill, 2017). Thus, regions are expected to preserve and conserve the natural environment and resources, including wildlife, biodiversity and ecosystems. Goodland (1995) emphasises that regardless of the geographical scale (i.e. local, regional, national or global), the need to consider and preserve natural capital and life-supporting ecological systems is the basis for sustainable development. Graymore *et al.* (2008) emphasise that a region's responsibility for promoting sustainability includes the management of waste, pollutants and greenhouse gases because these affect vital ecosystems essential for human survival. Eder and Narodoslowsky (1999) argue that sustainable development is possible if regions and their industries take responsibility for a wide range of environmental pressures, including waste management, pollution control, and water treatment. Consequently, industries in regional Australia can do more to support environmental sustainability (McManus, 2008).

Economically, regions can support local economic livelihoods by tackling underemployment, unemployment, wages and income inequality, imports and exports, productivity, poverty alleviation, unequal wealth distribution and fluctuations in price of domestic products (Stimson *et al.*, 2003; Jain, 2012). Shearlock *et al.* (2000) maintain that the economic indicators of sustainable regional economy should include a strong market, wealth creation, industry, services and employment. Allison and Horemans (2006) perceive fisheries in small coastal and regional communities as a major source of sustainable economic livelihoods. Wheeler (2009) further argues that, to attain sustainable economic development, regional

industries should reduce negative impacts on social and ecological systems, rather than provide mere economic prosperity through increased production and consumption of goods and services. Spangenberg (2005) takes the view that although every economy needs to attain economic growth and development, economic sustainability must be achieved through sound environmental practices.

Socially, achieving equity, peace and justice in regions may come with many challenges because social sustainability is often multi-dimensional, dynamic and always evolving (Dempsey *et al.*, 2011; Chapin *et al.*, 2004). Despite these conceptual challenges, Cuthill (2010) proposes indicators for assessing social sustainability. He suggests that regions can achieve social sustainability by providing equal opportunities; allowing equal access to services and facilities; ensuring equal participation in decision making; and promoting continuous social networks and interactions. Coelho *et al.* (2010) also added to the list of indicators by revealing that regions can improve social sustainability by addressing the issues of social inclusion and participation, interactions, inequality, health, security, safety, quality of life, quality goods and services, sense of place and identity, education, welfare, hunger, diversity, culture and traditions. Regional resilience has been added to the list of indicators because the essence of the above indicators is to make regions survive and thrive in the face of uncertainties and adversities (Magis, 2010). The rich contexts of regions offer an avenue to explore how industries pursue sustainable development objectives.

## **5. INDUSTRIES, REGIONS AND SUSTAINABILITY**

There is a growing interest in understanding how industries contribute to sustainability in regions (Truffer and Coenen, 2012; Skellern *et al.*, 2017; Gibbs *et al.*, 2005). Gibbs *et al.* (2005) observe that industry sustainability has become a new basis for local and regional development, where issues such as industrial ecology and eco-industrial development are explored in regional studies. Despite the growing link between industry sustainability and regional sustainability, relatively few studies have examined this connection (Skellern *et al.*, 2017).

Research exploring the role of industries for sustainability in regions has delivered mixed findings. Some previous studies have revealed that industries play a significant role in sustainability transitions in regions. For example, Maier *et al.* (2017) assessed regional sustainability of the agricultural industry in Austria and found that the organic farming systems that use renewable energy sources are able to promote sustainable

agriculture in a regional economy. In studying climate change innovation in wine industry regions of Australia, Galbreath (2016) found that the wine industry has implemented climate change innovation programs at a high level. Donald (2008) investigated the role of the organic, ethnic and specialty food industry in sustainable regional development and found that the food industry sector has generated economic activities and promoted environmental innovation. Moreover, the food tourism industry has created a regional identity by improving environmental awareness and sustainability and socio-cultural benefits for regional communities (Everett and Aitchison, 2008).

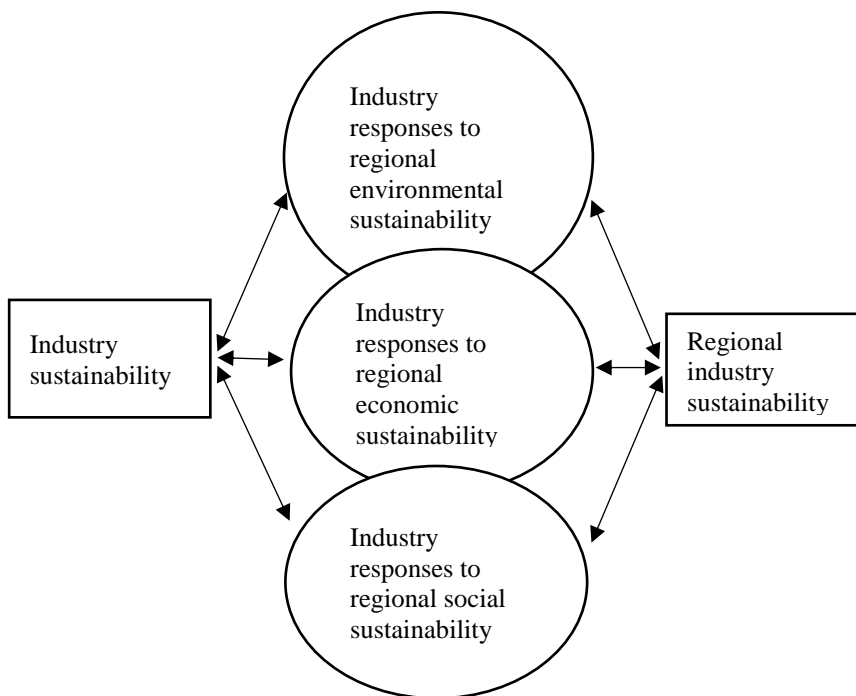
Conversely, other research examining the impact of industries on sustainability in regions has shown that industries can hurt regions. In assessing the sustainability of Australian fisheries, Leceta *et al.* (2015) and Farmery *et al.* (2015) found that despite the socioeconomic benefits, the industry causes serious environmental problems. As Pauly *et al.* (1998) indicate, global fisheries are also noted for being unsustainable, and are blamed for the overexploitation of marine organisms through destructive practices. McManus (2008) explores three Australian industries—the thoroughbred breeding industry, coal mining industry and wine industry—regarding their impacts on environmental sustainability. The study finds that these regional industries have negative environmental impacts on the regions being studied. It is clear that industries can be problematic for regions, but with the appropriate institutional support and guidance, they can contribute towards sustainability transitions in regions (Delmas and Toffel, 2008; Hoffman and Ventresca, 1999). These findings demonstrate that industries in regions can support sustainability, when given appropriate regulation and guidance.

## **6. REGIONAL INDUSTRY SUSTAINABILITY: A CONCEPTUAL MODEL**

To frame the discussion on the fishing industry's perception of its contribution towards the sustainability of the Eyre Peninsula region, a conceptual model was developed. As shown in Figure 1, this model represents regional industry sustainability which was conceptualised by analysing and synthesising the literatures on industry and regional sustainability. Regional sustainability represents an important opportunity for industries to support the sustainable development agenda in regions (Truffer and Coenen, 2012). Based on this, we propose bridging the concepts of industry sustainability and regional sustainability to develop the regional industry sustainability model. Merging ideas and insights from



both concepts can offer a new theoretical perspective on industries, regions and sustainability (Deutz and Gibbs, 2008; Haughton and Morgan, 2008). The industry and regional sustainability literature reveal that industries are a critical part of regional sustainable development (Gibbs *et al.*, 2005; Deutz and Gibbs, 2008). We thus argue that sustaining regions is inconceivable without the long-term economic, environmental and social contribution of industries.



**Figure 1.** Regional Industry Sustainability. Source: the Authors.

The model proposes that regional industry sustainability requires industries to respond to economic, social and environmental issues in regions. The dominant view is that industries have the resources and capabilities to support sustainable development in regions (Cretney, 2014). Industries provide a comprehensive understanding of how regions can develop new industrial paths by promoting the emergence and growth of new businesses with the aim to support sustainable economic development (Hassink, Isaksen and Trippel, 2019; MacKinnon *et al.*, 2019). Although it

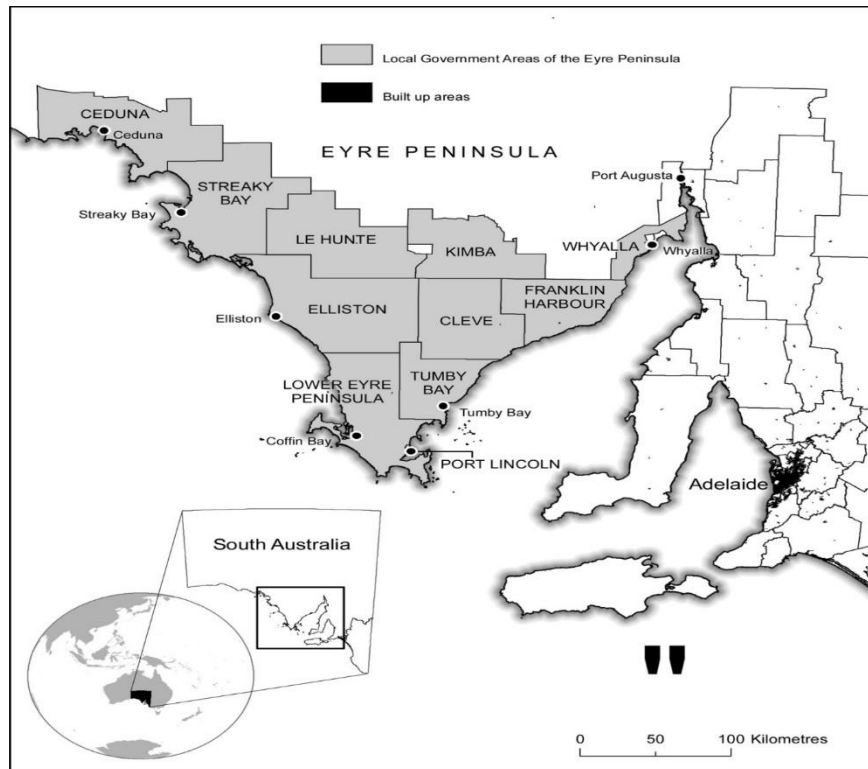
was previously perceived as an impossible dream, industries are now pursuing economic development with key consideration to the environment. Hardy and Lloyd (1994) maintain that industries can address the complicated balance between economic and environmental development through effective regional policies. Truffer and Coenen (2012) argue that one of the ways that industries are balancing the economy with the environment is through investment and promotion of green innovation in regions. Industries can also promote cleaner production and industrial symbiosis by connecting with other industries to gather resources to invest in green regional development (Deutz and Lyons, 2008). Industries influence social development through food systems planning, sustainable city building and sustainable food capitalism (Donald and Blay-Palmer, 2006; Donald, 2008). Developing and sustaining regions requires resilience which industries provide by promoting new growth paths especially where industrial, network and institutional resources are available (Boschma, 2015). Industries can also support the sustainability of industrial regions by radicalising democracy, promoting local social economy and meeting basic human needs (Cretney, 2014; Coenen *et al.*, 2015). This model might help us empirically analyse and organise the perceptions of the fishing industry regarding its contribution towards the sustainability of the Eyre Peninsula region.

## **7. METHODOLOGY**

### ***Setting***

This study was conducted on the fishing industry located on the Eyre Peninsula region in South Australia. The Eyre Peninsula is bounded on the east by the Spencer Gulf, the west by the Great Australian Bight, and the north by the Gawler Ranges. It has a population of 6 592 and its main employing industries are agriculture, forestry and fishing (ABS, 2015). The fishing industry is located on the Eyre Peninsula because the region has substantial coastal and marine environments (which include marine and conservation parks) and encompasses approximately 250 islands ranging in size from about 180 to 40 000 square metres. These coastal and marine environments provide a favourable working space for most of the fishing sectors. The fishing sectors are geographically spread across the region (e.g., Ceduna, Cleve, Elliston, Franklin Harbour, Kimba, Lower Eyre Peninsula, Port Lincoln, Streaky Bay, Tumby Bay, Whyalla, and Wudinna), and can be located along the Great Australian Bight (see Figure

2). But most of the fishing activities are centred on Port Lincoln, as one of the busiest fishing ports in the region.



**Figure 2.** The Location of the Eyre Peninsula Region, South Australia.  
Source: Kroehn *et al.* (2010).

A report from the South Australian Centre for Economic Studies (2012) suggests that fishing is one of the largest industries that plays a significant role in the development of the region. The fishery in the Eyre Peninsula consists of a variety of value chain actors involved in seafood production, processing, distribution, supplying, retailing, wholesaling, and policymaking (Delforce *et al.*, 2005). The structure of this industry comprises of three major fishing specialisations, which include marine finfish, molluscs and crustaceans. The key sectors within the finfish specialisation include Southern Bluefin Tuna, King George Whiting, Snapper, Sardine and Salmon. The key sectors within the mollusc

specialisation include Scallop, Abalone, Oyster, and Mussel. The key sectors within the crustacean specialisation include Rock Lobster, Crabs and Prawn. Each of these fishing sectors are managed by their own industry association. As a result, three industry sectors managed by their respective industry associations were selected namely: The Southern Bluefin Tuna sector (ASBTIA) for finfish, The South Australian Northern Zone Rock Lobster sector (SANZRLFA) for crustaceans, and The South Australian Oyster sector (SAOGA) for molluscs. The essence is to represent each of the fishing specialisations within the Eyre Peninsula's fishing industry in the study. According to the reports from RDA (2016) and PIRSA (2015), these fishing sectors make a significant contribution towards the sustainable development of the Eyre Peninsula region.

This industry is recognised as critical to the region (RDA, 2016). Reports indicate that the fisheries support environmental programs and institutions designed to ensure ecological sustainability of the region (RDA, 2016; PIRSA, 2015). Another importance of this fishery to the region can be attributed to its socioeconomic impacts (EconSearch, 2015). For example, the Eyre Peninsula's fishing industry contributes \$379 million to the State's economy annually, and much of this wealth was generated in regional South Australia, largely from the Eyre Peninsula (EconSearch, 2015; ABARES, 2015). Employment in the lower Eyre Peninsula is largely created in agriculture, fisheries and aquaculture (EconSearch, 2016). The commercial fishing industry in the Eyre Peninsula generated approximately 3 108 jobs in South Australia, however, most of the jobs were created in regional communities (PIRSA, 2015). Despite the economic, environmental and social impacts of this fishery, its main challenge is to continue to compete with other seafood products from international fisheries on the Australian seafood markets (Skirtun *et al.*, 2012). Given the value of this fishery in the region, it made sense to understand how it perceives itself to be contributing to sustainable development.

### ***Design***

To gain deep insights into how the industry perceives its contribution towards the sustainability of the Eyre Peninsula region and to explain the symbiotic relationship between the industry and regional sustainability, we adopted a qualitative design. The qualitative design was chosen because it provides flexibility to tap the richness of data (Guba and Lincoln, 1994). Using this design, we were able to study the actors within their natural environment, which is the fishing industry on the Eyre Peninsula region.

Understanding the perception of the actors regarding their contribution to the sustainability of the region required us to interact and talk to the key people on the ground. We considered the key actors involved in the industry's value chain as practically appropriate. Because these actors have been involved in the production, processing, distribution, supply, retail, wholesale and policymaking within the fisheries for many years (Delforce *et al.*, 2005). Since this industry has a reputation for being sustainable (PIRSA, 2015; RDA, 2016) and has been operating for more than 100 years (Neil, 2001), we considered it appropriate to explore its contribution towards the sustainable development of the region.

### ***Data Gathering***

Participants were purposively selected across the industry's value chain. The participants included producers, processors, distributors, suppliers, retailers, wholesalers, industry association executives and policymakers. The participants were selected because they were strategically engaged with the industry and have been actively involved in commercial fishing activities in the region. The range of informants captured the intended strategic and operational aspects related to the link between the industry and the sustainability of the region and were chosen for their consistency across different levels within the industry. Initially, potential participants were contacted via email to invite them to participate in the study. During the initial contact, relevant research information was clearly explained to them and they later agreed to participate in the data collection exercise by completing consent forms. In total, 54 participants across the fishing industry sectors participated in the study and were interviewed. These participants represented horizontal, vertical and lateral actors in the industry's value chain. The horizontal actors were selected from competitive individual fishing sectors; the vertical actors included processors, suppliers, distributors and retailers; and the lateral actors were policymakers which included regulatory-government agencies and industry associations (Brown *et al.*, 2010). Consequently, the interview participants constituted seafood producers (e.g. fishermen, farmers, deckhands, divers, and farm managers), processors, suppliers, wholesalers, retailers, industry association executives and regulatory agencies—policymakers. The basic descriptive statistics of the participants who were interviewed are shown in Table 1.

**Table 1.** Participants (Actors) Characteristics.

Categories	Number of Participants	Current Positions
Horizontal Actors	<b>35</b>	
Oyster sector	11	5 Growers/Farmers 3 Divers 3 Farm Managers
Bluefin Tuna sector	13	3 Deckhands 4 Fishermen/Farmers 3 Divers 3 Farm Managers
Rock Lobster sector	11	3 Deckhands 3 Fishermen 3 Divers 2 Farm Managers
Vertical actors	<b>8</b>	4 Suppliers <sup>a</sup> 4 Processors/Wholesalers/Retailers <sup>a</sup>
Lateral actors	<b>11</b>	
Policymakers	4	1 RDA <sup>a, b</sup> 2 PIRSA <sup>a, c</sup> 1 AFMA <sup>a, d</sup>
Industry Associations	7	2 ASBTIA 3 SANZRLFA 2 SAOGA

Notes: <sup>a</sup>Vertically integrated and operate across multiple industry sectors. <sup>a, b</sup>Regional Development Agency. <sup>a, c</sup>Australian Fisheries Management Authority. <sup>a, d</sup>Department of Primary Industries and Regions, South Australia. Source: the Authors.

The data was collected using indirect observation and semi-structured interviews. We first came to know the region in an informal visit, but our interest grew when we realised that while the Eyre Peninsula is geographically distanced from other metropolitan cities and towns, its continuous development is strongly supported by the fishing industry. We used indirect observation to understand background and context and to identify key respondents. Additional information was collected during industry seminars, presentations and research workshops. Semi-structured interviews were largely used to gather most of the data. The interviews were concluded when theoretical saturation was reached (Seale *et al.*,

2004). The interviews allowed information to be obtained from the participants' view rather than the researchers' (Creswell, 2013). An interview guide was designed with a list of interview questions that reflected the nature of the information the researchers wanted to uncover. Sample questions included: Do you think fishing contributes to the long-term development of the Ere Peninsula? And how? These questions allowed participants to state the facts and offer their opinions freely. Standard interview techniques and protocols (Patton, 1990) were employed without limiting the field of inquiry. Interviews were conducted at locations chosen by interviewees in the region. The interview guide was adjusted accordingly to the different key participants and their ability to respond to the questions. The duration of each interview lasted between 20 and 50 minutes. The interviews were voice and digitally-recorded with the consent of interviewees. Data from interviews and indirect observation was transcribed, combined and processed for analysis.

### ***Data Analysis***

The data was analysed using inductive thematic approach (Gioia *et al.*, 2013). We used Nvivo11 to code the data thematically (King, 2004). The inductive thematic approach allowed us to identify relevant themes (Braun and Clarke, 2006). Qualitative coding enabled us to identify segments of the data as relating to, or being an example of, a more general idea, instance, theme or category (Lewins and Silver, 2007). We coded the data to create relevant themes and identify codes pertaining to and manifesting industry responses to regional sustainability issues. We created some of the themes during the first order coding (e.g., environmental protection, stock management, creating wealth, creation of local jobs, reinvestment, sustaining local industries, regional branding, infrastructural developments, population density, and longevity and resilience). The first order coding involved descriptive interpretations of the data, which we used to create first order themes and managed to adhere faithfully to informant terms (Gioia *et al.*, 2013). As the coding progressed, new first-order categories were created or merged. We tried to capture actors' experiences, feelings, and thoughts about their contributions to the region.

For the second stage of coding, we created second order themes (Gioia *et al.*, 2013) moving toward a more theoretical understanding of the data (e.g., regional social sustainability, regional economic sustainability and regional environmental sustainability). The inductive thematic process supports iteration between the existing literature and identified themes. For

example, we conceptualised interviewees' report of environmental protection and stock management as 'fishing and regional environmental sustainability'. We also conceptualised descriptions of creating wealth, creation of local jobs, reinvestment and sustaining local industries as 'fishing and regional economic sustainability'. We further conceptualised actors' reports of regional branding, infrastructural developments, population density, and longevity and resilience, as 'fishing and regional social sustainability'. Looking at these three second order themes, we concluded that they were the perceived contribution of the industry towards the sustainability of the Eyre Peninsula region, thereby representing the dimensions of regional industry sustainability (see Figure 1). As advised by Strauss and Corbin (1998), the inductive thematic analysis allowed us to move beyond the initial descriptive analysis of the data into the theoretical realm.

In order to ensure the reliability and validity of the findings, the final thematic categories were established after follow-up discussion with the co-author, ensuring peer debriefing (Lincoln and Guba, 1985). In addition, data from multiple actors and sources were then compared to uncover biases. Thus, multiple iterations throughout the data highlighted no major conflicts and context-specific biases. Because the data was gathered from multiple respondents within the same industry, it also allowed for testing accuracy and consistency (Homburg *et al.*, 2012). Multiple data sources contributed to a broader and in-depth understanding of the subject matter and transferability of the findings.

## **8. FISHING AND REGIONAL SUSTAINABILITY: FINDINGS AND DISCUSSION**

The reports from RDA (2016) and PIRSA (2015) emphasise that the fishing industry is sustainable in the region because it provides social, economic and environmental benefits. During our analysis, we also observed three thematic categories namely: 1) Fishing and regional environmental sustainability; 2) Fishing and regional economic sustainability; 3) Fishing and regional social sustainability. These categories reveal the emergence of patterns between the fishing industry and sustainability of the Eyre Peninsula. The following themes demonstrate the industry's contribution towards the sustainability of the Eyre Peninsula region.



### ***Fishing and Regional Environmental Sustainability***

The reports from RDA (2016) and PIRSA (2015) suggest that the fishing industry support environmental programs and institutions designed to ensure sustainable development of the region. The Australian Fisheries Management Authority (AFMA) advocates for local and regional fisheries to be more sensitive to marine ecosystems and organisms (AFMA, 2018). Consequently, it was clear from the actors' comments that the industry is taking measures to be green conscious and transform its environmental sustainability practices. Some of the major environmental support that the fishing industry provides to the region include environmental protection, waste recycling, clean-up exercises, and stock management. Our analysis shows that actors within the industry support environmental sustainability programs in the region. Some of the actors said that the current generation of fishermen are doing what they can to reduce their negative impact on the environment and to protect the environment:

*"We are a sustainable fishery. We are doing everything right environmentally in our work and looking after the water that we grow our oysters" (Producer). "We've got the fishing technology to rape the sea a hundred times over and we have to educate them not to do that. We have a gentler impact on the environment" (Supplier). "The current generation of kids are better educated and they are a lot savvier in relation to looking after the environment and looking after natural resources so we don't have a few issues" (Policymaker).*

Several studies have elaborated on the negative environmental impact of the global fisheries (Pauly and Watson, 2003; Pauly *et al.*, 2002; Pauly *et al.*, 1998). Similarly, the sustainability of regional fisheries in Australia has been severely contested (Leceta *et al.*, 2015, Farmery *et al.*, 2015). However, most of the actors in the Eyre Peninsula's fishing industry claim that there is an ongoing attitudinal change towards the environment in the region. Education was mentioned as one of the critical contributors to the current change in attitude towards the environment in the region. Our finding complements the view of Potts (2010) that education provides learning, information and knowledge which are essential regional advantages that supports green transformation and consciousness among industries and businesses.

Most of the actors mentioned that as part of protecting the environment, they also recycle waste generated by the sectors of the industry. Graymore

*et al.* (2008) argue that waste management is critical to ensuring that regional ecosystems support human survival. Some of the actors also said that they are able to recycle through inter-sector collaboration and networking. This is because the industry has diverse sectors which means that recycling was possible if they can come together. Therefore, coming together and networking was necessary for them to manage their fishing waste in the region. Consistent with the views of Sharma and Kearins (2011), achieving regional sustainability requires organisations to interconnect and collaborate. It was clear that the industry recycles waste both onshore and offshore, as some of the fishermen had rubbish bins in their fishing vessels:

*“Regionally, we can take that pipe and chap it and recycle it” (Processor). “We look after the environment very well. We have a rubbish bin and we have a recycle bin on board. So everything goes in, everything is recycled now and is much different to our days” (Producer). “We put together with Tuna. We are so much into how to recycle all the plastics that are coming from our baskets and their big pontoons. So that is helping the whole environment and the image of the Eyre Peninsula” (Industry Association Executive).*

Some of the actors also commented that they organise regular clean-up exercises. Organising clean-up exercises was part of the environmental programs among the industry sectors. The actors revealed that there are two key drivers of clean-up exercises in the industry. The two key drivers of clean-up exercises are: inter-sector collaboration and industry size. The Eyre Peninsula’s fishing industry is a multi-sector fishery with diverse actors across the value chain, which means that they are more than enough to team up and collaborate. They also mentioned that the size of the industry is helpful in gathering enough support to clean-up regional beaches and bays. Some of the actors highlighted that the fishing industry sectors come and work together to ensure that the region is clean and tidy:

*“Our size means that we can do beach clean-ups and pick up debris from oyster, abalone and other seafood sectors like prawns and rock lobsters” (Industry Association Executive). “We do clean-up of the bays together, with all the sectors. For example, keeping our bays clean is like when stuff breaks, we pull it out of the water so we don't have the oyster farms littered. So we keep harbours clean and keep the region tidy” (Producer). “There is got to be a fine line because you have to be commercially viable*

*but it is more than just selling that equipment but trying to assist things like clean-ups” (Supplier).*

The global concerns for fisheries is the rate of depletion of marine organisms and ecosystems. Pauly *et al.* (2002) were of the view that the sustainability of the global fisheries is worrying and something has to be done. In Australia, most research and government reports point to the same direction of ecological sustainability of marine organisms including fishes and that high mortality rates can collapse the industry (PIRSA, 2015; Leceta *et al.*, 2015; Farmery *et al.*, 2015). Despite these environmental threats, some of the actors within the Eyre Peninsula's fishing industry felt that they are currently working on managing stocks by reducing and controlling fish mortality and depletion rates in the region:

*“We have something on our cray pots called seal protection devices. We used to put them in when we are around seal activity and now we have got these devices on 24/7, even if we are not in areas that are affected by seals. We just introduced some new management arrangements in our fishing to ensure that we don't cause any species depletion” (Producer). “They can certainly contribute to the region because it is a very sustainable industry...it is good...their husbandry systems and their mortality. But in years gone by, there was 8-10 per cent mortality which is a lot. It feels like 50 000, or 100 000 fish in your farm. But last year there was a farm and that farm had 32 mortalities out of 25 000” (Policymaker).*

Our findings show that the various fishing sectors are conscious of the lives of the marine organisms and preventative measures are now put in place to protect marine organisms. This practice was supported by the new management regime that was introduced by AFMA to ensure that fisheries do something to prevent the depletion of marine organisms (AFMA, 2018). According to the actors, most of the sectors are now working to improve fish stocks and stock densities. These environmental activities and programs demonstrate that the fishing industry is currently responding to environmental issues that concern the region. Addressing these concerns is useful for improving the ecological sustainability of the fishing industry. Ecological sustainability is essential for managing regional ecological and environmental footprints (Graymore *et al.*, 2008).

### ***Fishing and Regional Economic Sustainability***

Previous reports mention the socioeconomic value of the fishing industry to the Eyre Peninsula region (EconSearch, 2016; EconSearch, 2015). These reports stress that the region depends heavily on the economic activities of the industry. Our findings show that fishing contributes to the economic sustainability of the region by generating wealth, creating local jobs, providing income, improving spending, promoting reinvestment and sustaining local industries and businesses. These were the main economic benefits of the industry to the region. A report from EconSearch (2015) notes that the fishing industry in the Eyre Peninsula region contributes \$379 million to the State's economy annually and much of this wealth was largely from the Eyre Peninsula. According to most of the actors, although the region can boast of other industries, fishing generates and brings the most wealth. The actors felt that the absence of this wealth would be terrible for the region:

*“The fishing is the greatest wealth generator in the Eyre Peninsula by far even though there is wheat here but it doesn't generate the type of wealth that seafood does” (Policymaker). “The seafood industry being probably the second largest revenue generator in the region is probably prime for that. It creates wealth on the peninsula and, without it, it will be terrible” (Producer). “These small sectors they are very important as they don't make those connections between sustainable products that is replacing itself and bringing back overseas currencies. That is a major way sectors are contributing to the Eyre Peninsula” (Processor).*

Allison and Horemans (2006) maintain that fisheries make regional economy stronger and more vibrant by providing people with sustained economic livelihoods. The Eyre Peninsula's fishing industry was considered a creator of local employment and jobs. Our findings are consistent with the report from EconSearch (2016) which clearly indicates that employment in the Eyre Peninsula is largely created in agriculture, fishing and aquaculture. This may be attributed to the size and number of fishing sectors in the region. This industry has over eleven fishing sectors and each sector creates jobs for the people living in the region, especially those in the small, rural and distanced coastal communities. As a source of sustainable livelihoods, the actors believe that the industry can go a long way to sustain regional townships and coastal communities. We also observe that 'jobs for the locals' was an important contribution of the industry to the region:

*“At the moment, it is creating a lot of work for a lot of people and has for a lot of years and I hope it will continue to do so. It is a good source of livelihoods for many people here” (Processor).  
“We employ a lot of people and sustain townships like Coffin Bay and Smoky Bay and other places like that that have no employment” (Producer). “In terms of our contribution, we run our business to employ people locally, they live in the area, and these are part of the sustainable local community and economy” (Retailer).*

Stimson *et al.* (2003) were of the view that industry plays a key role in addressing regional income and wage issues, which is essential for strengthening regional economic development. Consistently, most of the actors mentioned that fishing generates a lot of income for the people working in the industry and living in the region. The income generated was not only for individual persons and families but also for the State, as indicated by the EconSearch (2015) report. The actors also believe that incomes brought in by all the fishing sectors increase local spending and enhance the purchasing power of families and individuals:

*“They do come on board for the tuna industry to keep work going and to get the income going” (Producer). “One of the sectors that generate a lot of income to the communities and to the State” (Producer). “Money is circulating. They are buying houses. They are spending money. And they are buying a lot of beer every day” (Processor). “The money that is brought into this region through the fishing and employment is what sustains not just one or two families, but ten or fifteen families and it is really crucial for the coastal communities” (Policymaker).*

Reinvestment appeared to be one of the most unique economic contributions of the industry to the region. This was unique because it was surprising to hear from most of the actors that majority of the sectors of the industry have reinvested a large part of their profits and surpluses in the region. The actors noted that the region depends on the reinvestment of the industry sectors and without them, Eyre Peninsula might not survive. According to the actors, they reinvest their income surpluses in community development and social services that benefit the people living in the region:

*“I have never seen in the world where the people in the seafood industry or tuna particularly reinvest all their profits or surpluses in this region. There is no other town in Australia or city in*

*Australia that is dependent on the re-investment of one industry” (Industry Association Executive). “They all pick something they are all passionate about that fulfil the community needs and have invested in that area” (Policymaker). “They put money back to the town so that would be important for the towns and the Eyre Peninsula” (Producer). “There is more money and things put back into the communities” (Supplier).*

The value of regional industries is that they offer new insights into industrial path development (Hassink *et al.*, 2019). Regional industries are critical for developing a new industrial path because they can support the emergence and growth of new industries and businesses in regions, as part of their contribution towards sustainable economic development (MacKinnon, *et al.*, 2019). Our findings suggest that the fishing industry facilitates the emergence of new businesses and industries in the Eyre Peninsula. Most of the actors were of the view that fishing industry also supports survivability and continuity of local industries and businesses, especially the marine-based industries such as ecotourism:

*“If you were to look at the growth of the tourism industry on the Eyre Peninsula, I will say probably 90 per cent of them will be marine-based. For example, swimming with sharks, swimming with tuna, swimming with seals, turtles, fishing and bay tours and seafood restaurants are still here because of the fisheries” (Policymaker). “We support a lot of businesses including the processing industries, maintenance, suppliers and all those sorts of businesses. If this industry falls over, all these other industries are falling over too” (Producer).*

Our findings suggest that the economic effect of the fishing sectors on regions are significant, as some of the actors felt that without fishing in their region, other regional businesses may collapse. Consistent with the view of Donald (2008), food industries, in particular, are becoming major drivers of socioeconomic activities towards regional economic development.

### ***Fishing and Regional Social Sustainability***

While the economic and environmental contributions of the Australian fisheries dominate the sustainability discussions, the social aspects have been sidelined (Barclay, 2012). This concern raises the possibility that the lack of information and documentation on the social impacts of the

fisheries in South Australia may in fact, alone, compromise the long-term future of the industry, despite its economic success (Brooks, 2010). Our findings indicate that the fishing industry in the Eyre Peninsula is addressing social issues such as regional branding, sponsorships and philanthropy, infrastructural developments, sustainable living and quality lifestyle, population density and longevity and resilience.

Regional branding can be developed by regional food industries (Lee and Arcodia, 2011). Everett and Aitchison (2008) were of the view that the food industry plays a decisive role in regional identity building because brands in themselves signify particular identities. Generally, the Eyre Peninsula region is locally, regionally and internationally recognised as 'Australia's seafood frontier' (RDA, 2016). This is a trademark that has built a sound identity and image for the region in many years. Most of the actors mentioned that this image and identity as 'Australia's seafood frontier' came about because the region was created around fishing. To keep this brand identity, most of the sectors are working together. This regional brand around fishing is well-recognised in the global fish market:

*"We have got farming and fishing in this town. They are the two big businesses in this area. I think it is a bit of a trademark for this area and it is very important for this area" (Producer). "There is no doubt that if you were to take away the whole rock lobster fishing out of the Eyre Peninsula, I can assure you that half of the Chinese will forget where Eyre Peninsula is because Abalone and Lobster are without a doubt the two products that all the Asians markets know. Tuna yes but in Japan and not in China. So the seafood industry and the Eyre Peninsula are connected" (Producer). "In marketing regions, the Eyre Peninsula region and the outputs from there are obviously the relationship that can work together and should work together" (Producer). "Some of these different sectors have done some work on regional branding" (Processor)*

Most of the actors indicated that philanthropic and sponsorship activities of the fishing sectors in the region are substantial. Some of the actors even revealed that the nature of the industry is generosity, which can be seen in the way they invest in community facilities without expecting a financial return. Our findings suggest that each of the fishing sectors has contributed to the development of the local communities in a substantial way. Some of them have also sponsored community activities, including food festivals. This finding aligns with the views of Lee and Arcodia (2011) that regional

industries play a decisive role in promoting food festivals and destination branding. Because regional food festivals are a chance for local operators like boat hiring and fishing charters to advertise what they do. Food festivals are also a great way to raise awareness about the Eyre peninsula. The regional food festivals enhance and strengthen the existing brand of the region:

*“The philanthropic side of their nature is that they all pick something they are all passionate about that fulfil the community needs and have invested in that area. I am sure they make no money out of those things, and they do contribute to services and to community facilities in a fairly substantial way” (Policymaker). “In the tuna sector, the way they contribute is through sponsorships of community events such as food festivals and sports events” (Producer). “Donating to charity and all that sort of thing. We always have a strong sense of giving back to our communities” (Producer).*

Pascoe (2014) stresses that the social objectives of the Australian fisheries management must include ensuring access to adequate infrastructure. Often providing such social services is the responsibility of the government. Our findings suggest that the fishing industry supports, funds and invests in social and physical infrastructure development in the region. Some of the actors clearly indicated that most of the infrastructural base in the region was developed by the fishing sectors. Others were of the view that the region depends on the industry to develop the small coastal towns and provide them with social facilities and physical infrastructure. Cuthill (2010) opines that access to social facilities and physical infrastructure improves the quality of life of people living in regional communities. Most of the actors said that some of the fishing sectors have funded more physical infrastructure from their wealth. Some of them felt that without the fishing industry, the region might lose most of its social facilities and infrastructure that the people currently enjoy:

*“All these developments in Port Lincoln is Tuna money” (Producer). “The region is dependent on our seafood industry to keep things going for the areas and develop our towns and areas. You don't want to lose the infrastructures in the towns” (Producer). “There is a spot ground there that was basically built for the community, so it pretty good way of giving back to the region” (Supplier). “The seafood industry in particular and the Tuna fishermen like they have got a bigger income so they*



*contribute to things like buildings, swimming centres, purchasing buildings and opening gymnasiums and all sorts of wonderful things within the communities” (Policymaker).*

Fishing as an enterprise is a way of life for fishermen and fishmongers in local and regional communities (Anderson and Obeng, 2017). Our findings reveal that the fishing industry provides sustainable living and a quality of lifestyle for the people residing in the region. Some of the actors felt that fishing is more of a lifestyle than a job. Besides providing local employment, it promises a quality of lifestyle. The actors thought that some of the communities and families depend on the existence of the various fishing sectors and their economic activities for continuous survival. Though it is the responsibility of regions to improve quality of life and lifestyle for those living in local communities (Graymore *et al.*, 2008), the fishing industry directly and indirectly support sustainable living and provide quality lifestyle in the Eyre Peninsula region:

*“If we make money, we live and live comfortable life. We can buy a nice car; we can buy a nice Boat; we can go fishing and enjoy the area and that is what the seafood sector brings” (Producer).*  
*“Worth a lifestyle and if not just for me, it is for my family and future generations (Producer). I think it is more of a lifestyle than anything else. And it provides a way of life and a vein for life” (Producer).* *“We saw the evidence that if you want to make a sustainable living for yourself, your family, for your friends and for your town, then you have to fish and farm sustainably” (Supplier).* *“It is really crucial for the coastal communities and for the fishermen to have an opportunity to have a reasonable living” (Policymaker).*

Most of the actors described the industry as a ‘population drawcard’. They explained that as a multi-sector industry, it helps to increase the region’s population. Some of the actors thought that the fishing sectors through their economic and business activities have drawn many people and families into the region. This has increased the critical population density of the local towns and communities. The majority of the actors interviewed also felt that without the fishing sectors, the population of the Eyre Peninsula may decrease. Our findings show that fishing can be a social mechanism for managing regional migration and population:

*“If you kick the Tuna sector out, then a lot of people will leave” (Producer). “If there is no work, there is no industry, and there is no community, then people leave, and if there is no work, people can't stay” (Producer). “They have all got families and so then it adds to the critical density of the population of the towns” (Producer). “The seafood contributes largely to the Eyre Peninsula as a region because it draws people here. If there is no opportunity for work and family to have a good life, then obviously they are going to move away or not come at all so our population will decrease” (Policymaker).*

Our findings suggest that the fishing industry contributes to the longevity and resilience of the region. Our analysis shows that both longevity and resilience are interrelated ideas. This is because some of the actors maintained that if the fishing industry collapses, it can negatively affect the ability of the Eyre Peninsula to continue to exist and thrive. Magis (2010) explains that resilience expresses adaptation and continuity in the face of socio-economic adversities. According to some of the actors, fishing supports the continuous existence of the Eyre Peninsula region:

*“The history of fishing towns in the world is not a good one because their collapse is quite prolific and they collapse for a whole range of reasons. A lot of towns have collapsed because of the introduction of say 200-mile limits. Some have collapsed because fishing has collapsed” (Producer). “If it was not here, Port Lincoln would be a ghost town I think and a shitty little dusty town” (Producer). “As a region, the industry contributes in a huge way because there are a lot of towns here that wouldn't [otherwise] have existed” (Producer). “There are some areas of the Eyre Peninsula that rely heavily on commercial fishing sector for their viability” (Policymaker).*

From the actors' perspective, it can be said that regional longevity simply denotes a region's ability to thrive for a long time, even in the face of adversity. The ability of the industry to exist means the region can still remain resilient. Thus, the absence of the fishing industry would be damaging to the Eyre Peninsula region and its people. However, the continuous existence of the fishing industry does not only provide social benefits, but also enhances economic and environmental development in the Eyre Peninsula region.

## **9. IMPLICATIONS AND CONCLUSION**

This study has revealed the fishing industry's perception of its contribution towards the sustainability of the Eyre Peninsula region. A qualitative approach was adopted to gather and analyse the perceptions of key actors within the Eyre Peninsula's fishing industry to understand how they perceive themselves to be contributing to the sustainable development of the region. The empirical evidence has shown that there is a symbiotic relationship between the industry and the sustainability of the region. We understood that most of the actors believe the industry is concerned about environmental issues in the region. We also observed that the industry provides social services in the region. We further realised that without the industry and its related business activities, the regional economy would not have survived. We thus conclude that the fishing industry perceives that it contributes to the sustainability of the Eyre Peninsula by responding to and addressing critical social, economic and environmental issues. The study has provided insights into how Australian fishing industries can support sustainability transitions in regions. The subsequent subsections elucidate the significance of this study by discussing its theoretical, managerial, policy and research implications.

### ***Theoretical Implications***

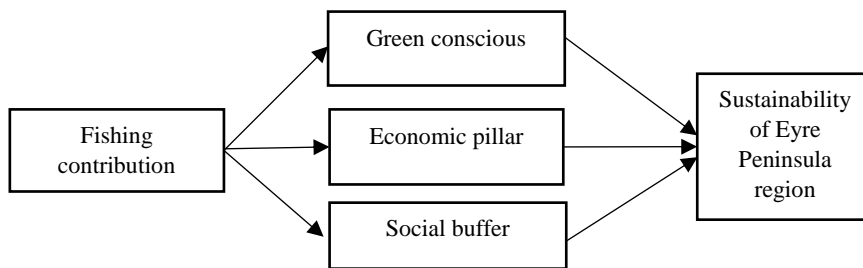
While there is a growing interest in the intersection between industry and regional sustainability, exactly how industries perceive their contribution towards the sustainability of regions is less examined and documented (Skellern *et al.*, 2017). To the best of our knowledge, no study has documented how actors within the fishing industry perceive their own contribution towards the sustainability of the Eyre Peninsula region (Mazur *et al.*, 2004). This study has contributed to closing the gap in the literature by exposing how an industry perceives its contribution towards regional sustainable development. This is essential because previous studies have reported on whether or not industries are supporting sustainability (Donald, 2008; Farmery *et al.*, 2015; Leceta *et al.*, 2015; Everett and Aitchison, 2008), but have ignored how the industries themselves feel and think about how they are contributing to sustaining regions. We argue that studying industries can provide an in-depth understanding of regional sustainable development.

The current study advances theory by developing the concept of regional industry sustainability and proposing a conceptual model (see Figure 1),

which might guide future scholarship and empirical investigation. The proposed conceptual model, as shown in Figure 1, highlights the notion of regional industry sustainability which was developed from the integration of ideas, insights and information gathered from the synthesis of the literature on industry sustainability and regional sustainability. The literature suggests that for regions to achieve sustainability transitions, industries must be considered as critical partners because of their social, economic and environmental relevance (Gibbs *et al.*, 2005; Deutz and Gibbs, 2008; Coenen *et al.*, 2015). The consideration of industries as critical partners for achieving sustainable development echos the views of Sharma and Kearins (2011) that industries play a significant role in achieving regional social, economic and environmental sustainability. Regional industry sustainability requires industries to support regions to achieve social, economic and environmental objectives. For example, the main argument in the industry sustainability literature is that sustainable industries pursue social, economic and environment objectives (Jansson *et al.*, 2000; Paramanathan *et al.*, 2004). While the regional sustainability literature also explains that regions can achieve sustainability transitions with the help of industries (Sharma and Kearins, 2011; Smith *et al.*, 2010; Truffer and Coenen, 2012). The basic idea here is that without the resources and commitment of industries towards addressing sustainability issues, sustainability transitions may be inconceivable in regions. We argue that promoting regional industry sustainability is critical as the idea helps us to fully understand the role that regional industries including the fishing industry can play in sustaining regions. The empirical evidence from this study has shown the social, economic and environmental role that the fishing industry plays in promoting sustainability transition in the Eyre Peninsula region. According to our findings, regional industries can provide social services, promote the economy and preserve the natural environment and marine ecosystems. In particular, regional industry sustainability research might present a unique opportunity for cross-fertilisation between regional studies and sustainability research, where the role of regional industries can be debated and defined. We argue that regional industries can help accelerate sustainability transition in regions when given the needed policy and institutional support. Sharma and Kearins (2011) also recommend that achieving regional sustainability is possible through inter-organisational networks of industries and businesses in regions.

In addition, this study further advances theory by developing and proposing an empirical model which was developed by gleaning dominant insights from the interview analysis. As shown in Figure 3, we inferred

from the interviewees that the fishing industry perceives itself as a significant contributor to the sustainability of the Eyre Peninsula by being 'green conscious', an 'economic pillar', and a 'social buffer'. Our findings suggest that most of the actors believe they are responding to social, economic and environmental sustainability challenges that confront the Eyre Peninsula region.



**Figure 3.** Fishing and Sustainability of the Eyre Peninsula Region. Source: the Authors.

The actors within the fishing industry maintained that they have become 'green conscious' and want to be seen as sustainable. The analysis revealed that the actors believe that the industry is changing previous unsustainable practices and behaviours. The actors perceived that the industry is embracing sustainability and becoming greener than expected in the Eyre Peninsula region. McManus (2008) argues that despite the destructive nature of regional industries, they can promote the perpetuation of environmental quality for present generations, future generations, and other species. According to our findings, some of the actors said that the new generation of fishermen are more educated and environmentally friendly than older generations. This means that education is a critical factor in promoting environmental consciousness within the industry. Some of the actors believed that a change in environmental attitude is supporting this green consciousness that contributes to regional environmental sustainability. These findings reiterate the point made by Potts (2010) that besides environmental innovation, one of the natural advantages of regions is the education of its industries and businesses, as new knowledge and information can transform unsustainable practices and promote green innovation. Additionally, most of the actors of the industry felt that the industry has become an economic pillar in the region. This is simply because its business and economic activities contribute to regional

economic sustainability by creating local employment and sustaining other local businesses in the region. Martinez-Fernandez and Potts (2008) argue that economic changes to regions have advanced in the last decade due to regional industries because they are able to drive prosperity, industrial growth and job creation. Some of the actors even mentioned that without this fishing economic power, most of the coastal communities in the region may not survive. Our findings complement the views of Allison and Horemans (2006) and Anderson and Obeng (2017) that fishing as a local enterprise represents a key source of sustainable livelihoods for people living in the coastal towns and communities. Likewise, our finding suggests that the industry has become a social buffer for the region. The case evidence revealed that the fishing industry supports regional social sustainability by improving the quality of life of people and families living in small coastal towns in the Eyre Peninsula region. For example, most of the actors said that the industry has contributed portions of their incomes and wealth to investing in social facilities and physical infrastructure. Social buffering may require adaptability which is possible through regional resilience (Boschma, 2015). Marshall *et al.* (2007) argue that occupational attachment and employability provided by the commercial fishing industry are important influences on social resilience. Cretney (2014) believes that regional industries can help decrease state involvement, increase community self-reliance and restructure social services to improve the social wellbeing of regional people. Thus, sustaining regions might be inconceivable without industries and businesses.

### ***Managerial and Policy Implications***

The findings of this study are significant for managers and policymakers. The managers of the fishing industry and industry associations have a duty to help the industry to carry out regular sustainability assessments. Often it is the regulatory institutions that conduct regular checks on industry practices and propose appropriate recommendations and solutions. Since the future of the industry depends on being sustainable, it is pertinent for the industry managers and industry associations' executives to internally assess sustainability performance of the industry in the region. This is because often the importance and credibility of different sources of information on the sustainability performance of the fishing industry, especially in the Eyre Peninsula region, vary (Mazur *et al.*, 2004).

Managers can also do an external assessment of external stakeholders' perceptions of the industry's sustainability performance in the region.

Integrating internal and external perceptions of sustainability performance are critical for comparing information and showcasing the value and role of the industry in the region. Although most of the actors interviewed believed the industry is now doing well to integrate sustainability principles, there is the need to carefully manage the negative perceptions of some external stakeholders, including the local communities and customers. This is because some local communities and government institutions seem to have a negative perception of some of the fisheries, as being unsustainable in the Eyre Peninsula region (Mazur *et al.*, 2004). This negative perception can hurt the industry by developing wrong identity. This negative identity can eventually destroy the industry. The negative identity can be corrected when managers take advantage of being green conscious to build a more positive identity in the communities. Building an effective link between sustainability and industry identity is a dynamic process, which might lead to tensions and inconsistencies among various dimensions of sustainability and stakeholders' interests, both at industry and regional levels. However, when that happens there must be an integration of the different sustainability perspectives and interests (Hahn *et al.*, 2015). Thus, the managers can consider cross-fertilisation of ideas from the diverse key actors within the industry and the region.

Managers can also improve the industry's sustainability performance in the region if they promote stronger inter-sector collaboration. Industry collaboration can be a key strategy for the industry to improve and reinforce positive identity domestically (or regionally) and internationally and might also contribute to managing the current image and reputation of the industry globally. Sharma and Kearins (2011) demonstrated how local businesses and organisations promote regional sustainability by coming together. The Eyre Peninsula's fishing industry is a dynamic industry with multiple sectors. This means that the industry can consolidate and appropriate new ideas, information and solutions to address social, economic and environmental challenges in the region. Furthermore, as a traditional enterprise, the Eyre Peninsula's fishing industry should demonstrate that it can be a progressive business. To develop such an image, industry associations of the various fishing sectors in the Eyre Peninsula can increase their investment in green innovation and cleaner production programs (Gibbs *et al.*, 2005). Besides these investments, investment in education for actors and employees of the various sectors and firms within the industry is critical for increasing sustainability consciousness.

Policymakers can support regional industry sustainability through effective and appropriate policies. Deutz and Gibbs (2008) proposed that promoting eco-industrial development in regions require government to pay attention to cluster-based industries. This may require policies that bring together all the industries in the region to report and disclose their investments in industrial sustainability programs. Also, policymakers can help reduce the costs of negative perception to the fishing industry. This is important to secure the value of the industry to the region. Mazur *et al.* (2004) suggest that this can be done if government and industry understand, acknowledge and respond to community perceptions of the industry. Responses might include involving community in the way the industry addresses social, economic and environmental issues in the region. Annual assessment of community and government perceptions might also help the industry reduce the costs associated with negative perception. Dialogue based on trust, collaboration and transparency between industry and regulating institutions might be an essential mechanism for accurate reporting and recognition of the sustainability initiatives of the industry in the region. Regional policymakers and planners might also want to develop sustainability policies and programs that truly recognise and integrate perceived industry contributions.

#### ***Limitations and Future Research Implications***

This study has some limitations common to qualitative research. The proposed empirical model as shown in Figure 3 which is based on case evidence does not suggest a causal relationship between themes involved. It however constitutes a pictorial representation of the perceived contribution of the Eyre Peninsula's fishing industry. Future research could gather more empirical data to fully validate and test this model. The study sought to investigate the perception of the fishing industry concerning its contribution towards sustainable development of the Eyre Peninsula region. However, the fishing industry on the Eyre Peninsula employs over 1 300 people (RDA, 2016) and has over 10 fishing sectors and multiple actors (PIRSA, 2015). This study only interviewed 54 actors from the industry. Future research could increase the number of actors in order to develop a comprehensive understanding of the subject matter. The study gathers and analyses the perception of internal stakeholders, without the views of external stakeholders including customers and community members. But a limited number of policymakers—regulating institutions central to the internal dynamics of the industry were interviewed to comment on the perception of the industry regarding its contribution



towards the sustainability of the region. Future research might want to compare the internal and external perceptions regarding the contribution of the fishing industry towards the sustainability of the region. In future, research should be conducted to compare how each of the different sectors within the industry perceives its contribution towards the sustainable development of the Eyre Peninsula region.

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