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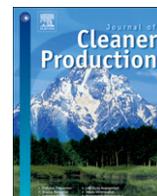
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The natural advantage of regions: linking sustainability, innovation, and regional development in Australia

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ABSTRACT

The combined impacts of the financial crisis and climate change are driving the evolution of sustainable business and changing the way that governments plan for development. Markets are emerging for a range of environmentally orientated products and services as societies move (or lurch) towards reducing impacts and adapt to changing conditions. National governments are actively formulating policy and providing investment to develop green economies as one of the responses to the global financial crisis. Many of the political and economic drivers have been focused at the international and national scale, and while critical for setting the national framework for development, it often neglects the key role that regions and localities can play in ecological modernization. This paper explores two regional case studies in New South Wales (NSW), Australia, that are initiating shifts towards networks of sustainable businesses and communities and offers recommendations for further policy development. The focus of this paper is on the evolving regional sustainability market and its relationship to other social institutions including governments, communities and the individual. The unifying concept is the idea of the 'natural advantage', a model that integrates innovation and sustainability as a part of the regional development policy agenda.

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1. Introduction

As regions change in the global economy debates are emerging about what constitutes effective forms of development and governance at a regional scale. Pressures from a global financial crisis, an aging population, declines in stocks of natural resources and the emerging effects of climate change are significant issues for regions. Economies must decouple environmental impacts from development processes, and increasingly policy formulation is turning to the 'greening' of economies as a way of simultaneously meeting the challenges from the economic downturn and addressing the issues of climate change. Green economies focus on climate mitigation and adaptation, develop low-carbon energy and transport alternatives, dramatically increase energy efficiency across all sectors, negate pollution, integrate with conservation, and create jobs in sustainable industries. From China to the United Kingdom to Australia, the greening of economies must harness the power of innovation to develop new products and services that reflect society's appetite for addressing sustainable development – reducing the environmental impact from economic activity while promoting development that increases the quality of life.

The notion of region has evolved as a unit of innovation, economic growth and an appropriate scale to resolve the challenges of sustainable development (Bellamy et al., 2003). Research on regional innovation and industry clustering (Porter, 1990) suggests how clusters of related industries exist in networked, competing, complimentary and interdependent relationships and are able to create successful and innovative outcomes. Clusters are embedded in a regional context through the creation of chains of activities that drive competition and value adding to products and services. Critically, clusters are embedded in a regional context and specialisation and can be considered organic entities that develop and grow through support from their constituent firms, regulatory agencies, and communities (Porter, 1990; Hargraves and Smith, 2005). Clusters and knowledge-based development has a clear extension into the regional sustainability debate, in particular the development of green clusters where a region can move towards an economy based on its unique ecological features and adaptation of the existing economic base (Gibbs, 2000).

The growth of the sustainability movement has influenced the debate on regional governance. In particular, the notion of *ecological modernization* and *industrial ecology* is relevant to the development debate. Ecological modernization argues that economic development and environmental issues can be reconciled to form a new development model. It subscribes to a technology, innovation and market based approach to addressing environmental problems (Janicke,

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2008). Ecological modernization is traditionally viewed at the scale of the nation state, however, there is a body of literature and practice that links the concept with regional development (Janicke, 2008; Brand and de Bruijin, 1999). This is a logical proposition. With regional planning on the policy agenda (Bellamy et al., 2003; Hargraves and Smith, 2005; Shaw and Kidd, 2001) and the sustainability literature advocating a regional approach as an appropriate scale for integration of economic and environmental concerns, the *region* should be considered an appropriate scale for linking ecological and socio-economic processes. This is supported by the concept of *industrial ecology* that advocates increased efficiency of material and energy flows within a regional industrial system, analogous to material flows within an ecosystem where waste is treated as a resource and systems are holistic rather than linear (Burstrom and Korhonen, 2001).

Regions can be defined along many characteristics: social, cultural, economic, or biogeographical. Opinion and criteria are diverse, from natural phenomena representing the spatial aspect of relationships between societies and the physical landscape through to functional attributes such as connectivity and socio-economic systems. Brunckhorst (2002) identified the regional-landscape interface as one that draws together societal and biophysical attributes (e.g. catchments) into a 'bioregion' and integrates aspects of governance and ecological processes. Regional sustainability governance provides a framework where traditional smaller scale sustainability programs at the firm or organisation level are scaled upwards to a regional focus. This links businesses, universities, municipal authorities and citizen groups together in a regionally focused effort (Burstrom and Korhonen, 2001) but requires significant societal mobilization, resources, and improved institutional coordination (Berger, 2004).

Economic changes to regions have advanced in the last decade, with knowledge-based industries contributing to regional economies and traditional resource-based and manufacturing sectors seeking to align with the 'knowledge economy' (Martinez-Fernandez and Potts, 2008). Innovation is recognised as a key driver of growth in regions and one of the main contributors to prosperity (Martinez-Fernandez and Potts, 2008; OECD, 2001). Innovative activities and networks of knowledge exchange are increasingly a means of developing the 'know how' to address a range of environmental problems such as water, energy, waste, ecosystem restoration, and biodiversity loss (Martinez-Fernandez and Potts, 2008; Koschatzky and Kroll, 2007; Potts et al., 2007). This shift towards a knowledge focus and the recognition of sustainability as an important element of regional policy (National Economics, 2002) drives efforts to reconcile economic growth, improvements to quality of life and the conservation of ecosystem services (Krehbiel et al., 1999). Innovation and sustainability are complimentary drivers but this relationship has been typically informal, segregated, poorly resourced and uncoordinated (Martinez-Fernandez and Potts, 2008). Departing from this tradition, this paper explores the emerging relationship between small to medium enterprises (SMEs) and regional sustainability outcomes. A novel concept 'the Natural Advantage' is introduced as a process to integrate innovation and sustainability policies and actions at a regional scale. The natural advantage manifests in three overlapping areas:

- 1) Policies and initiatives for ecological modernization and cleaner production in industry, government, and civil society;
- 2) Conservation and restoration of natural systems and maintenance of ecosystem services;
- 3) Innovation, knowledge transfer and partnerships between public, private and community based organisations.

The objective of the research was to investigate the opportunities for developing the in two Australian regions. The research was

locally focused and investigated the activities, challenges and experiences of sustainability orientated small businesses and the potential for upscaling to increasingly formal and coordinated regional sustainability strategies and development opportunities. The following research questions were asked:

- 1) How is the natural advantage defined? What are its key elements?
- 2) What is the role that the natural advantage can play in building regional sustainable development?
- 3) What are the activities that organisations perform to implement the natural advantage?
- 4) What are the opportunities that can boost regional environmental innovation?

2. The natural advantage and sustainable innovation

The Australian Conservation Report 'Natural advantage: A Blueprint for a Sustainable Australia' (Krockenburger, 2000) noted that 21st Century economies are carbon light economies and that the knowledge economy, the digital economy and the environmental economy are partners. Partnership is a central feature of natural advantage initiatives as success requires contributions from and coordination between government, business, and civil society (Potts et al., 2007; Krehbiel et al., 1999).

The idea for the natural advantage has been conceived predominantly at the scale of the nation-state and firm implying a top down policy approach (Hargraves and Smith, 2005). This is important because implementation requires cohesive national vision and policy coordination addressing issues such as climate change, energy and biodiversity. Firm scale analysis has typically focused on large companies, many of a multi-national character with the capacity to develop sustainability strategies. The concept of Corporate Social Responsibility (CSR) has played a significant role in developing sustainable business initiatives. The fate of so-called 'green companies' during the financial crisis has been highlighted in a recent report (Mahler et al., 2009) with companies that have placed an emphasis on efficiency, green innovation and strong governance showing above average performance during the financial downturn. The practice of CSR has been an important mechanism to build a 'community license to operate', respond to environmental issues in operations, build broader measures of success into corporate reporting (Dunphy et al., 2003; Benn and Dunphy, 2004). Public think tanks such as The World Business Council for Sustainable Development and the Global Reporting Initiative (Henderson, 2006) have championed the cause of CSR and provided intellectual capacity and support, for example by providing a database of CSR practices and initiatives. CSR is an increasingly common feature in larger corporations but in SMEs a lack resources, information or capacity can hinder development (Potts, 2007). In the context of SMEs the natural advantage can deliver a set of potential benefits including:

- Efficiency in energy, water, resources and waste;
- New markets and consumer demand;
- High quality processes and products;
- Support of local communities;
- Integration of local business needs and policy;
- Building social capital and partnership;
- Restoration of ecosystems;
- Improved local identity;
- Leveraging of resources for sustainability strategies and actions.

In the Australian context (Chifley Research Centre (2001) identified that the emerging environment industry is a key knowledge-

based economic contributor and is seen as an enabling sector for mainstream industry to build competitive businesses. Estimates indicate that the Australian environmental protection market is worth some 16 billion per annum employing 146,000 people in some 5700 businesses with the industry growing at 3% per annum (Department of Industry Tourism and Resources, 2004). A recent CSIRO study (Hatfield-Dodds et al., 2008) highlighted the role of ‘green collar jobs’ to address the challenges in Australia relating to climate change. The report found that there was considerable growth potential in traditional sectors (such as energy) that have high environmental impact – these sectors could be converted to restructure the economy towards a low-carbon future. The report found that the creation of at least 33,000 new jobs in manufacturing, 77,000 jobs in transport, and 145,000 jobs in construction over ten years would present a significant opportunity for re-training into greener industries (Hatfield-Dodds et al., 2008). This would be in addition to re-skilling of 2.9 million workers already employed in traditional sectors (Hatfield-Dodds et al., 2008).

The definition of a sustainable business is a topic of ongoing debate. Sustainable businesses can originate from socially progressive influences or the traditional industry base, but the points of distinction relate to governance, the commitment to corporate social responsibility, and the products and services produced by the organisation. Sustainability orientated industries pursue the social, economic and political change necessary to advance sustainability in society beyond the call of regulatory compliance. They are leading innovators in cleaner production and environmental management. The Central Coast Sustainable Industries report (CCCEN, 2005) identified the characteristics of sustainable business:

- Develops products and services that contribute to a sustainable society;
- Is open to public scrutiny;
- Develops products not detrimental to employee and community health;
- Engages in workplace and employee training, education and engagement;
- Contributes to local growth;
- Develops the use of information and communication technology and knowledge capability;

- Invests in research and development;
- Contributes to restoring local environments and has processes that are energy efficient, use renewable energy, and minimise wastes, resources and pollutants.
- Actively educate, promote and debate sustainable development.

Many industries are showing signs of shifts towards sustainability and exploring the rewards in efficiency and new opportunities – the so-called double dividend. This interest needs encouragement by appropriate policy instruments and market solutions that encourage uptake of successful environmental initiatives and convert them to a source of business competitiveness (Tukker et al., 2008). Regional innovation is clearly a part of this picture – it relies on knowledge-based approaches that involve the willingness and ability of firms and institutions to interact and exchange knowledge and skills (Berger, 2004; Martinez-Fernandez and Potts, 2008; Martinez-Fernandez et al., 2005). Across the economy and across the region, processes of learning and exploring can result in new products, services, and markets, develop entrepreneurial activity, and encourage regional diversification and employment (Porter and van der Lindem, 1995).

3. The natural advantage model

To frame the discussion on applying the natural advantage concept to regional policy development a conceptual model was developed to identify the key processes, inform the case studies and provide a policy model (Fig. 1).

The conceptual model is based on the environmental innovation literature with inspiration from Hargraves and Smith (2005), Gibbs (2000), Burstrom and Korhonen (2001), Martinez-Fernandez and Potts (2008), Australian Conservation Foundation (Krockenburger, 2000; Tukker et al., 2008). The model has a temporal basis, outlining a series of drivers and transformative measures over time with the end result an improvement of economic and environmental integration. In this sense it can be considered a normative framework that establishes goals or desired states.

The drivers for developing regional natural advantage include policy frameworks, markets for products and services, innovation strategies and the development of knowledge capacity and community ‘know how’. The drivers are the ‘baseline’ and informal processes

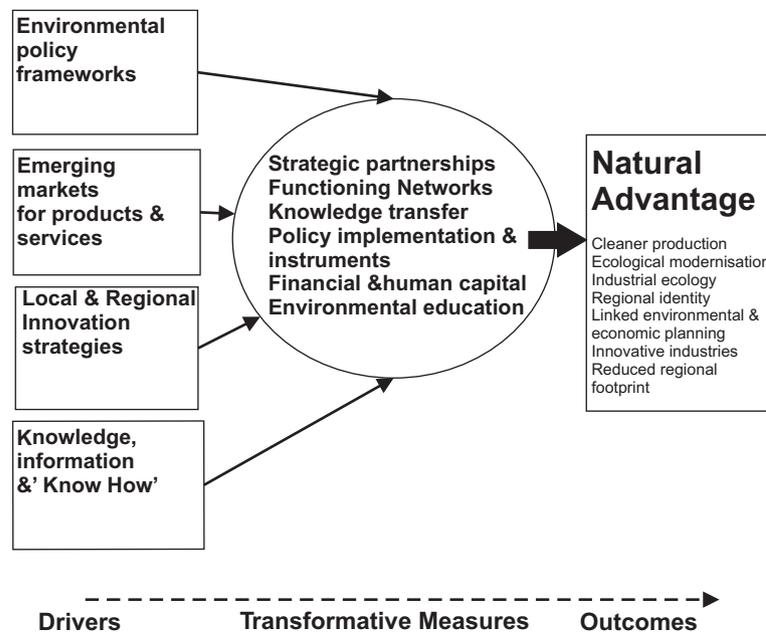


Fig. 1. The conceptual natural advantage model.

that need to be developed to progress regional natural advantage outcomes. Initially they are disconnected regional instruments that do not integrate into a cohesive policy process. From these baseline conditions flow information, formal and tacit knowledge, emerging policy frameworks, resources and importantly, coordination and engagement across private and civil institutions.

This paper subscribes to the view that policy frameworks and regulatory drivers play a significant role in stimulating the development of new markets (Martinez-Fernandez and Potts, 2008; Tukker et al., 2008). Instruments may manifest at the local, regional or national scale and can take the form of new regulations or policies such as energy efficiency measures; market based instruments such as subsidies or emissions trading schemes; and educational tools, strategies or networks that increase knowledge transfer. It is critical to encourage the development of markets for sustainable products and services (Koschatzky and Kroll, 2007) using a 'whole of society approach' with contributions from civil society, business, government, and educational institutions.

The development of local and regional innovation strategies is another component of the drivers for the natural advantage. While these initiatives have not traditionally been linked to ecological modernization, there are some local attempts in Australia to increase the dialogue between local businesses, communities, and universities around environment and innovation. The Regional Environmental Innovation Network (REIN) established by the University of Western Sydney and the Macarthur Centre for Sustainable Living (National Economics, 2002) is an example of a network that encourages dialogue between business, community, government and the university in the western Sydney Region. Despite its voluntary nature, this initiative has, over the past 3 years, been an important element in building local capacity.

The baseline conditions evolve over time and become a series of transformative measures. This moves a region from a set of uncoordinated and separate activities to an increasingly effective platform for regional transformation. Transformative measures build capacity, share knowledge, and create new opportunities for growth. Sharing of information, expertise and resources and increasing the understanding of the role of different sectors leads to new initiatives that can include cleaner production processes, new waves of environmental innovation, industry development and the development of a regional identity – all measurable by a set of regional indicators. The rationale for a transformative measures phase is to recognise that in the messy reality of moving towards the natural advantage, it is not clear (at this stage of the research) what the precise role, extent and influence each of the drivers has in delivering the outcomes.

From the conceptual model, we distil three research questions:

1. How do local companies engage with sustainable development and use the idea of the natural advantage to build a business?
2. What are the activities, drivers and barriers to local business relating to environmental innovation and sustainable development?
3. What are the opportunities that can drive environmental innovation and the natural advantage through regions?

4. Methodology

This research is influenced by the ideas presented by Flyvbjerg (2001) in taking a *phronetic* approach to social science. *Phronetic* social science emphasizes local context as a focus for the analysis. This is similar to the notion of issue oriented research that has a focus on context or place based questions in policy debates (Hogwood and Gunn, 1984). The analysis is a means to highlight the

relationships, political setting, and the dynamics underlying an issue that informs choices in policy-making (Parsons, 1995).

The research developed a qualitative case study methodology comparing two regions using semi-structured interviews as the primary data collection method. The unit of measurement was the firm or organisation that conducted sustainable business activities, aggregated to the level of regional case study. Organisations that conducted sustainable business activities were selected from several sources: green business registers, business incubators, and local sustainable business initiatives. Interviewees were screened according to availability within the research timeframe. Despite the fact that sustainability orientated firms are a very small proportion of total regional firms, there is considerable interest in their growth and expansion. The interviews undertaken are highlighted in Table 1 and list the region, organisation, and the classification (public or private). The interview instrument consisted of 29 structured and open questions over five sections: general business information; how natural capital is viewed within the organisation and the region; sustainable business activities within the firm; environmental reporting and governance; and collaboration, networking and innovation.

The approach taken meant considerable time was spent with organisations, discussing their operations, processes and outcomes. Interviews were conducted from November 2005 to April 2006 and consisted of a face to face meeting that lasted 2–3 h that was recorded and transcribed. The aim was not a survey of limited variables across a region, but to obtain detailed contextual information about business activities, values, and motivations (Yin, 2003; Flyvbjerg, 2001). A structured research design linked the literature, research questions and conceptual framework to the interview instrument as a means of building construct validity (Shaw and Kidd, 2001). The instrument was piloted with an existing firm in a different region. Several limitations were noted. This included the lack of statistical information on national and regional industry structure, access to firms and organisations, the length of the interview and instrument, and the limitations with small scale pilot research. Some questions were not consistently answered by some firms, and other firms expanded significantly on various topics in an open manner.

Table 1
Central Coast and Blue Mountains Case Studies.

Region	Sector	Public or Private governance
Central Coast		
Case 1	Non-Government/Business Incubator	Public
Case 2	Waste/Recycling	Private
Case 3	Building/Sustainable design	Private
Case 4	Manufacturing/Renewable Energy	Private
Case 5	Agriculture/Turf	Private
Case 6	Non government/Environment and community	Public
Case 7	Consulting/Environment and Education	Private
Case 8	Retail/Solar Hot water	Private
Case 9	Education and Training	Private
Case 10	Agricultural/Chemical	Private
Case 11	Manufacturing/Renewable Energy	Private
Case 12	Nursery and Landscape	Private
Case 13	Government	Public
Blue Mountains		
Case 14	Retail/Energy	Private
Case 15	Tourism/Accommodation/Conference	Private
Case 16	Government	Public
Case 17	Consulting/Sustainability	Private
Case 18	Tourism/Accommodation/Conference	Private
Case 19	Consulting/Sustainability	Private
Case 20	Tourism/Ecotourism	Private
Case 21	Education/Research	Public

Twenty-one organisations across two outer metropolitan regions of Sydney, Australia were interviewed to investigate the natural advantage concept (Fig. 2). The regions are major population zones on the fringe of the metropolitan region and both are considered dormitory suburbs for commuters to the employment hub of greater Sydney. The regions have considerable growth potential and the local economies are dominated by small to medium enterprises. Both regions have stocks of natural systems and are renowned for their scenic quality and natural environments. Both regions have developed a range of local initiatives for sustainable business development and have established local government sustainability strategies.

The Central Coast is a rapidly growing suburban coastal region located 90 km north of the major metropolitan region of Sydney and 100 km south of Newcastle metropolitan region. The Central Coast consists of the local governments of Wyong Shire and Gosford City Council, the most populated local authorities in the state of New South Wales. The region is characterised by rapid residential growth, a large commuter workforce and sensitive coastal ecosystems. The regional economy is dominated by retail (18.5%); health and community services (12.4%); manufacturing (11.7%); construction (10.5%); business services (8.3%) and hospitality (8.3%) sectors (ACC, 2004). The Central Coast is recognised for its significant natural ecosystems including beaches and estuaries; coastal lowlands that contain internationally significant wetlands, waterways and littoral forests; and elevated valley and mountain systems with a mix of wet and dry temperate communities. The environmental quality and proximity to Sydney is a net attractor of residents and business. In 2006 the estimated population was 307,766 with an annual growth rate of 0.8%, concentrated in the Wyong Shire (Central Coast Research Foundation, 2007). By 2021 it is estimated that there will be 368,000 people living in the region (Central Coast Research Foundation, 2007). Population growth is placing pressure on coastal ecosystems with particular strain placed upon the central estuaries that are surrounded by residential and commercial development. In recent years the Central Coast has experienced a potable water shortage driven by an increasing population and lack of rainfall in the reservoir. This has

resulted in water restrictions across the region. Employment remains a significant issue on the Central Coast. The total regional labour force was 152,700 in 2006 of which 142,400 were directly employed (Central Coast Research Foundation, 2007). Unemployment in 2006 was 6.7% compared with a national average of 4.5%. In addition unemployment has grown from 5.8% to 6.7% between 2005 and 2006. A feature of Central Coast employment patterns is that 35,000 workers commute on a daily basis to employment centers in Sydney. This creates a range of social, economic and environmental problems.

The Blue Mountains is an area of international ecological significance approximately 60 km west of the Sydney metropolitan region. The Greater Blue Mountains World Heritage Area (GBMWH, 2008) is an area of international natural and cultural significance with the 1.03 million hectare Greater Blue Mountains Area has listed as World Heritage because of its outstanding biodiversity. The local administration is the Blue Mountains City Council with the LGA covering an area of 143 000 km². The total population of the Blue Mountains in 2008 was 76,719, a stable figure that has remained fairly stable since 2001. The dominant employment sectors are education and training (14%); health and community services (13.9%); retail (10%); public administration (8.6%); and accommodation and hospitality (7%) (The Blue Mountains City Council). Unemployment stands at 4.9%, a drop from the 2001 total of 5.5%. It remains one of the most popular destinations in Australia for tourism with a turnover of 2.4 million visitors in 2006 (Tourism Research Australia, 2007) and contributing to approximately 13% of regional employment. Furthermore, 57% of the workforce commutes outside the area, predominantly to employment in Sydney (Blue Mountains City Council, 2002). A dominant feature of the business structure is the high proportion of SMEs with 90% of Blue Mountains businesses employing less than 10 people (Benn and Dunphy, 2004). The high proportion of employment in knowledge-based and service industries such as education, community and financial services indicate an educated and skilled workforce with 60% of the population possessing skilled vocational qualifications or bachelor degrees (Blue Mountains City Council, 2002).

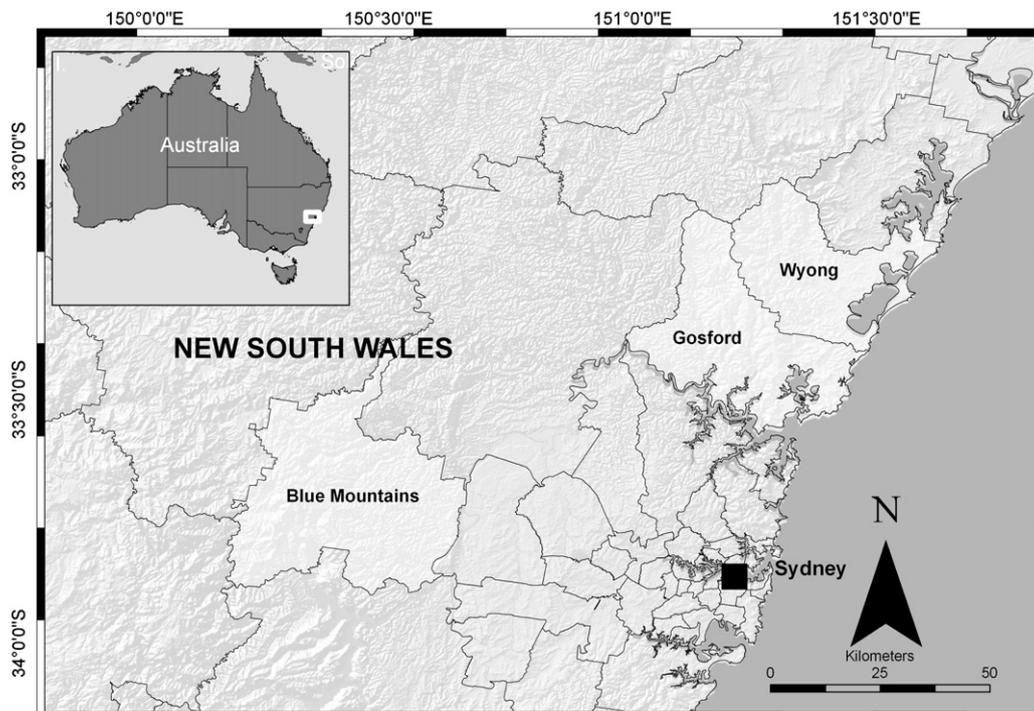


Fig. 2. The State of NSW highlighting the Wyong, Gosford and Blue Mountains local government regions.

5. Results for the Central Coast and Blue Mountains case studies

5.1. The role of the natural advantage in regional sustainable development

This section explores the results of interviews that asked questions concerning the relationship between the organisation, the region and the creation of the business. The natural advantage can play a unifying role in progressing regional development that integrates economic and environmental planning.

5.1.1. Entry into a sustainable business

The interviews highlighted a diversity of views regarding the motivation of the business and its contribution to the region. In terms of building local sustainable development, the interviews reveal that local firms and organisations from heterogeneous sectors consider themselves as 'sustainable businesses' and sustainability forms a core part of operations.

On the Central Coast, the responses suggested entry into a sustainable business came from many sectors: traditional trades, small business, concerned citizens, and entrepreneurs. When asked about the basis of the business a range of views were expressed by respondents:

"Originally money until we found out how bad the world was and how much help it needed. It definitely was an area that had a massive gap. The participants in our classes were a driver towards us learning more...as our knowledge has grown, the business has evolved and changed." [Case 9]

"It was the area I was skilled in...it wasn't that I wanted to make a difference or change the world's climate; it was the area I was trained in so it was naturally the best business I could go into." [Case 11]

The variety of entry points from different sectors has policy implications to reach to target audiences and discussions with existing and new business over sustainability practices. Traditional as well as new sectors can be targeted to 'convert' to a sustainability focus but the issue of skills and 'know how' is important (Hatfield-Dodds et al., 2008).

The Central Coast as it is home to a diverse and growing base of SMEs, with the dominant sectors across the retail, community services, construction, manufacturing, business services and hospitality/cultural services. The shift in the region from primary industries to service orientated industries (ACC, 2004) underscores the growth in knowledge-based services and the potential for growth in sustainability orientated firms.

In the Blue Mountains, interviewees identified a variety of drivers for the creation of a business with previous education and experience in conservation a common factor. Interviewees expressed opinions relating to a growing sustainability influence in previous businesses environments and changed businesses when an opportunity presented itself, such as a new business idea, change in direction or relocation to the region with its natural characteristics. In addition, other respondents discussed that sustainability added value to their existing operations:

"It seemed like an idea that met our altruistic and values needs and an opportunity to move into another career... finding out about sustainability and seeing its opportunities aligned with all the things that we thought we wanted in our career, it was a life change and a coming together of the knowledge that drove it" [Case 17]

"We didn't say we were going to create this environmental business... it was just a gradual process... I do have

a background in accommodation and combining my knowledge in that area we structured the property to accommodate various markets." [Case 15]

This underlies the importance of sustainability education and skills in developing the natural advantage. This appears to be region independent – effective education programs can lead to more community awareness and highlight opportunities for individuals and organisations to 'change tact', develop ideas, and focus entrepreneurial talent. In the case of the Blue Mountains the World Heritage status provided a clear trigger for regional discussions (and debates) about sustainability and a focus for environmental education.

5.1.2. How does the business relate to the region?

When asked about the role of the business within the region, Central Coast firms revealed a variety of motivations:

"... there is awareness in some sectors and I compare it to four years ago, there was no understanding. The only money to be made was in real estate, clearing land and the like. When I look at where we have come... it's actually a term which is in use now, people say 'I'm looking at setting up a sustainable business' the term is more widely used." [Case 6]

"We are looking at the end user. To get the end user asking for the right thing rather than relying on someone to push the right thing towards them. This puts less pressure on the builder to have to do the right thing, less pressure on the supplier to do the right thing because the customer is asking from the start. That's our theory, if we can convince them, then everyone above will have to follow suit." [Case 3]

The responses demonstrate a range of views concerning the contribution to the notion of region. Some businesses saw themselves educating customers and the community to preference sustainable products, acting as agents for developing markets for sustainable products and services. Other businesses felt their role was limited or the sector did not have critical mass. Several respondents felt that 'something was happening' in the community and market in terms of sustainability and that the publicised environmental issues concerning water quality and climate change were responsible for this change. Several respondents felt that it was 'early days' for developing a sustainable region and that business, community, and government had a long way to go in terms of education. Many firms identified that the key challenges in the region were changing the values of the public but government was lagging in developing sustainable business policies and support structures.

Businesses in the Blue Mountains identified consistent issues through the regional debate. These included the development of the local economy within the context of the World Heritage listing and the influence of the listing on the regions image; the role, extent and evolution of the tourism sector; and opportunities that could drive the sustainable business sector through the region. Several respondents noted that they felt more emphasis was required across the business community about the advantages and opportunities of living within a World Heritage area.

Globally, many regions are experiencing a similar shift. What the message is from this pilot research is that local and regional authorities should respond to the willingness of communities and businesses to explore new ideas and processes for creating local green economies. For example, authorities should explore the integration of environmental and economic development strategies, reform environmental education strategies to include entrepreneurial activities, and work in partnership to create sustainable business incubators.

5.2. What are the activities, drivers, and barriers to local organisations implementing sustainable business activities?

The case studies identified a mix of activities, drivers and barriers to local organisations implementing sustainable activities. A key observation was that the range of activities in a region related to the particular mix of socio-economic sectors and sustainability issues. Furthermore, any region choosing to go down this path must consider the socio-economic profile of its communities and use its particular strengths to develop innovative activity.

5.2.1. Sustainable business activities, drivers and obstacles: the Central Coast

The Central Coast is growing region that faces competing demands for employment generation and maintenance of the coastal environment. Results revealed a number of activities spanning the industry base with a focus on the development of products and services, education and partnerships.¹ Firms were questioned about their sustainable business activities that engaged the business on a day to day level. Understanding this pattern of activity is important as it identifies what mix of activities is contributing to regional natural advantage. Developing these activities allows businesses to experiment with innovation, develop new knowledge and products and services Table 2.²

On the Central Coast organisations developed environmental products, provided services or developed both. When developing both, this was found this to be a complimentary and reinforcing activity. For example, Case 11 manufactured remote renewable energy systems for an international market but focused on complimentary long term education and training about the product, its service and repair:

“We maintain a support service network in island nations – capacity, products, knowledge... there are thousands of solar panels in this region with many not working. Believe this is due to a hardware only approach to renewable development, rather than a technology service – whole system, holistic, hardware, software and knowledge.” [Case 11]

Another operator discussed the complimentary benefits of supplying environmental products (native plants) and services (database and ecological knowledge) in terms of business outcomes. This allowed for a degree of specialisation as a knowledge provider, allowing access to development and rehabilitation projects.

“I’ve got a computer database for local native plants- second to none. I do a lot of research and development...I have to because the plants that I grow aren’t grown by anybody else in the industry.”[Case 12]

The involvement of firms in adult and school education and the development of partnerships with business, government and community organisations was a significant feature of sustainable business activities on the Central Coast. Most organisations engaged in this form of activity to generate business, educate about their products and services, and access information and feedback about products. Developing partnerships was seen as a useful activity, but most partnerships were not developed in a way that directly benefited the firm and were short term. Partnerships were seen as good business practice, but time and resources was a significant factor. The activities that were least supported by firms

Table 2
Sustainable business activities on the Central Coast

Sustainable Business Activities	Environmental Products	Environmental Services	Green Purchasing Policy	Education or awareness	Partnerships	Research & Development	Monitoring	Conservation Activities	Examples
Case 1									Business Incubation Activities Networking support, TBL support
Case 2									Manufacture and sale of recycled products. Education of community
Case 3									Green home building & design, partnership with TAFE, schools. Greensmart member
Case 4									Produces solar panels and wind turbines. Export based. Support for customers in Pacific.
Case 5									R&D into new and drought proof products.
Case 6									Community awareness and education, projects, govt / private partnerships
Case 7									Home audits, solar devices, schools outreach and partnerships
Case 8									Manufacture of solar hot water
Case 9									Education & training of trades, research into green design, business outreach
Case 10									Cleaner production, Partnerships with schools & community, regulatory and voluntary monitoring
Case 11									Manufacture, installation, service & training of remote renewable systems
Case 12									Rehabilitation, native species supply, specialized local knowledge and services
Case 13									Primary and sec. education, industry partnerships, local studies, environmental management.

and organisations were monitoring and reporting and field based conservation. In terms of monitoring and reporting, it was clear from the interviews that sustainability indicators and triple bottom line were beyond the reach of small business. The concept was found to be useful, but the time and resources associated with this activity was problematic. One firm noted:

“... reporting is time consuming, would be good to have time to sit down and do analysis, and would be nice to get grants for reporting and work with the universities doing reporting.”[Case 3]

Firms were asked to identify the drivers of their activities. Table 3 highlights the responses.

Regulations were cited as a high driver for developing sustainable activities. Regulations and policies were viewed in two ways. The first is that regulation caused a firm to act in accordance with a particular ruling such as an emissions standard. The second view was that regulations provided new opportunities for businesses. The most frequently cited reform was BASIX (the NSW Building Sustainability Index) that requires new developments in to incorporate sustainable design into residential and commercial buildings to gain development approval. Mandatory building standards, while problematic initially with the industry, have led to widespread adoption of efficient designs and increasing social acceptance of ecological efficiency. Increased environmental awareness within the firm was another driver that resulted in pressure for action or a willingness to act on sustainability issues. Several small businesses were familiar with the concept of sustainability and actively incorporated it into their business model. Interestingly, community pressure was listed as a driver of low importance. This suggests for establishing sustainable business activities, businesses and organisations may respond more towards internal awareness

¹ The full list of identified activities, products and services in available in the research report (Potts, 2007).

² *ibid*

Table 3
Drivers of sustainable business activities for Central Coast firms

	High importance	Medium importance	Low importance
Regulation or policy			
Environmental accreditation			
Community pressure			
Increased environmental awareness			
Customer / shareholder pressure			
Cost savings & efficiencies			
Competitive advantage			
New markets			
Staff or CEO			
Grant or partnership			

(from employees or management) than to external community pressure. Cost savings, efficiencies, competitive advantage and the development of new markets were all identified as drivers of high importance for developing sustainable business activities but lacked clear engagement strategies. Competitive advantage was seen an important driver, but was viewed as a likely future state rather than a present advantage. It was felt that with increasing concern over environmental issues and the prospect of new regulation, innovative companies developing sustainable products and services would develop competitive advantage in the future. This argument is backed by Porter and van der Linde (Unknown, 2002) who discuss that the fastest emerging markets are increasingly in the area of sustainable products and services.

Respondents identified the issues that were a barrier to developing sustainable business activities, listed in Table 4. The issues that were raised as major obstacles to developing activities were cost to research or implement, lack of adequate funding and a lack of time. Several interviewees noted a lack of government assistance and a difficulty in accessing and generating research and development on their products and services.³

“Research is what I really want to get moving but it's very difficult for a small business. Accessing grants and partnerships is difficult. I could just use our own money... but I'm not terribly inclined to do that. I'm looking for a cheaper way through a grant.”[Case 4]

5.2.2. Sustainable business activities, drivers and obstacles: the Blue Mountains

The Blue Mountains has a small but significant base of sustainability orientated businesses in the services sector, including firms that use the World Heritage status as a means of developing sustainable business activity. There was a distinct difference in the mix of sustainable business activities in the region as compared to the Central Coast as displayed in Table 5.

Table 4
Obstacles to sustainable business activities

Obstacles	Major obstacle	Minor obstacle	No obstacle
Cost to research or implement			
Organisational 'silos'			
Businesses leadership			
Technical barriers			
Regulatory or policy framework			
Community support or interest			
Lack of adequate funding			
Staff knowledge capacity			
Lack of time			
No identified commercial benefit			

The regional expertise is focused in three areas. The first relates to the development of environmental services such as sustainable accommodation, retreats, ecotourism, and strategies for corporate and public organisations. The second focuses on the development of partnerships and networks. The third specialisation relates to environmental education and covers a variety of formal and informal activities that contribute to the growth of 'know how' and skills. The focus on services and education was a clear distinction from the more mixed activities of the Central Coast. There are two dominant, if slightly contradictory influences for the development of sustainable industries. One is the need for the diversification of the Blue Mountains economic base as a strategy to shift from over-reliance on tourism. This would open space for new businesses, reduce travel times to centers in Sydney, and harness the high educational standard. The other influence for developing a sustainable industry base is the dominance of tourism. Tourism is a considerable economic influence and provides a large source of customers and revenue. Development of high quality sustainable accommodation and ecotourism services is a regional goal but must be responsive to supply and demand. While the World Heritage listing is important for awareness, education, and branding, some interviewees felt that the importance of the World Heritage message was not resonating within the broader community.

5.2.3. Regional branding: an innovative approach?

In response to this issue, a regional branding program was initiated. The Blue Mountains Business Advantage program encourages business to sign on to sustainability principles as fitting to a community inside a World heritage domain. This program established an accredited label that identifies firms have participated in a sustainable business course. The brand is owned by Blue Mountains Tourism Limited and administered by the regional Chamber of Commerce and assisted by the City Council.⁴ Businesses that wish to be accredited attend a one day training workshop that covers issues such as the business case for sustainability and implementing the triple bottom line. Accredited organisations receive a license to use the brand logo for their own marketing and receive further training

³ See full report (Potts, 2007).

⁴ Interview data (Potts, 2007). Refer to the BMBA website: <<http://www.bluemountainsadvantage.com.au/>>

Table 5
Sustainable business activities in the Blue Mountains

Sustainable Activities	Business	Business Activities								Examples
		Environmental Products	Environmental Services	Green Purchasing Policy	Education or awareness	Partnerships	Research & Development	Monitoring	Conservation Activities	
Case 14										Selling energy products, research into design & application, community education
Case 15										'Green' accommodation, environmental education, monitoring programs.
Case 16										Regional ecolabel (BMA program), community education, partnerships with business.
Case 17										Organisational sustainability strategies, business partnerships, community education.
Case 18										Development of green hospitality products, green retreats, design, education.
Case 19										Networking, ecolabel, organisational strategies
Case 20										Eco-tourism, client education, professional courses, advocacy.
Case 21										Research and advocacy on regional issues

and information on using the brand. The in initiative appears to be catching on in the business community. The challenges include encouraging organisations to sign up, establishing clear benefits, and building the legitimacy of the brand through identifying reduced impacts and changes associated with accreditation.

There are strategic links between the provision of environmental services, networking and partnerships, and environmental education. For example, environmental education at a community level may increase awareness about energy and climate. Increased awareness can lead to a greater demand for products and services such as energy efficient appliances. Education can also work for the firm, contributing to understanding the merits and impacts of different technologies and aid in the creation of informal knowledge networks. Not only is the demand for products increased, but new services such as green design, conservation activities, and eco-friendly tourism and accommodation move from niche to mainstream practice.

The drivers for the Blue Mountains businesses are presented in Table 6. The obstacles for sustainable business activities were not identified consistently amongst the Blue Mountains interview respondents rendering them unsuitable for a matrix display. However, in discussing their operations, individual respondents identified obstacles that affected them.

The drivers for Blue Mountains sustainability orientated businesses are the development of partnerships and networks and the influence of managers in setting a vision for the firm. This matches the pattern set by the social statistics in the region – it is a small regional economy that has significant quality of life factors and a highly educated community. Many businesses move or start up in the region due to the World Heritage influence and it would come as no surprise that many managers push this influence into their business strategies, particularly in a competitive small business environment. The region has a strong ecotourism sector and engaging in partnerships has been a driver of innovation, however, considerable ongoing reform was needed to being the sector to maturity.

For one firm, the commitment to sustainability practices offered customers a clear choice. These practices were not seen as widespread through the sector, with the result that the firm believed it gained a competitive advantage. However competitive advantage was not a widespread driver across all interviews. Through marketing and an international accreditation scheme specifically

Table 6
Drivers of sustainable business activities in the Blue Mountains

	High importance	Medium importance	Low importance
Regulation or policy			
Environmental accreditation			
Community pressure		Not answered	
Increased environmental awareness			
Customer / shareholder pressure			
Cost savings & efficiencies		Not answered	
Competitive advantage			
New markets			
Staff or CEO			
Grant or partnership			

for the sector (ecotourism), significant benefits flowed to the firm. However the cost of accreditation was an obstacle unless the benefits were clearly identified.

“Through being accredited we’ve had some advantage. It is standing us alone and saying we have done the hard yards... it has given us a reputation that proceeds us wherever we go. We have people who know about us in America, England, Japan, Singapore, Asia, and Europe. But the cost of becoming sustainable and staying sustainable is high, the product value becomes high and therefore you reduce your client base.” [Case 20]

For several firms accreditation was an effective means to new markets through sustainability orientated product differentiation and recognition. However, not all businesses were open to the idea of accreditation. In reference to the local accreditation scheme, the BMBA, several operators believed the program required reform.

“I cannot say that I have seen concrete results from accreditation. I certainly don’t think it hurts ... If it is there, use it and join it. And the more of us, I think if the whole community got onboard it would make a difference.”[Case 15]

Through the identification of issues that affected the creation of the business, the role of environmental awareness and the status of World Heritage was clearly a factor in driving business activities.

“We probably rate it (sustainability) as number 1 in our business. Since we started (name omitted) we initiated the Triple Bottom Line approach, everything we do has to have a balance, social, environmental and economic.” [Case 20]

“One (issue) for me would be to try and get the city accredited as a sustainable city and stand as a benchmark for education and make the Blue Mountains an icon...so that universities, TAFE, the council, National Parks could engage ... could set up the city as the first city in the world that has been accredited as minimal impact. ... we need to have the community stand up and recognise that they are in a world heritage area.” [Case 21].

In terms of constraints, the issue of knowledge capacity and technical ‘know how’ was raised by interviewees. Similar to the

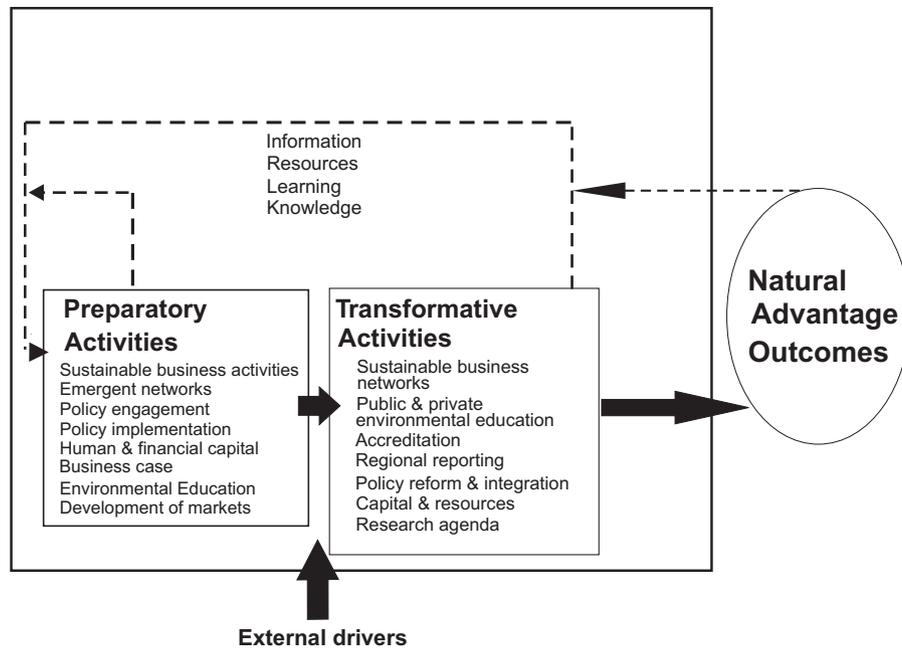


Fig. 3. The revised natural advantage model.

Central Coast, the means of accessing new knowledge and personnel with skill sets that supported the business was difficult. Accessing the latest information about products was also considered difficult. Often SMEs were busy running the day to day tasks of the business with little time to invest in broader knowledge concerning products and services. For example:

“(An obstacle is) the availability of the latest technology. I was looking at some sort of solar panels, but then (name removed) said there was a new solar panel in the market. And so I don’t know where to get the most up to date information... there is a time limitation for doing research.” [Case 14].

This underscores the importance of establishing mechanisms such as knowledge networks to assist SMEs in accessing appropriate information and resources concerning sustainable business activities, for example, new technology in the market. Community and business attitudes to sustainability were identified as another barrier to be crossed. Respondents felt that attitudes across the region were generally positive and changing, but resistance and a lack of awareness was present in many parts of the community, including many businesses. As one commentator noted:

“One of the biggest issues in my mind...is where sustainability needs to be put to the broader community almost as much or as the same time as it is put to the industry sector...this is big picture stuff...but if we link into everything down the chain so that the milk bar wants to be accredited (to the BMBA). It is not meant to put one against the other.”

6. Conclusions

6.1. Redefining the natural advantage

The conceptual model developed in Fig. 1 provides a lens to translate the natural advantage concept into a regional case study analysis. The model identifies drivers, transformative measures and outcomes as phases a region will move through to build natural advantage. It provides a starting point to identify key

activities and is a heuristic tool to capture what is a complex and evolving socio-economic phenomenon. It assists in understanding the regional context of these activities and the contested and complex terrain surrounding regional innovation irrespective of location.

As an approach ‘over time’ the initial model is less useful. Many activities identified in this model under drivers and transformative processes have been difficult to capture as time influenced dependant variables. The case studies have shown that activities such as networks, education and regulation are key drivers for developing natural advantage, but determining the precise relationship between drivers, transformative measures and a defined end point of ‘natural advantage’ is problematic. As a result of the case studies the conceptual model has been revised in Fig. 3.

The refined model takes a soft systems view of the development of regional natural advantage. The temporal element has been removed, with the understanding that the link between drivers, transformational activities and outputs is complex and occurs across interacting of spatial and temporal scales. The case studies identify that there are clear *preparatory activities* that support and drive *transformational activities* at the regional level.

Preparatory activities exist at an early stage of development, start with minimal resources, are predominantly voluntary, and build local capacity for more integrated and formal actions. Activities identified within the case studies, the literature and emerging practice elsewhere include:

- The development of eco-efficiency improvements and sustainable business activities within individual firms and organisations;
- Emergent and informal networks and community programs that link business, universities, community and government;
- Interest and engagement between policy makers and local business, development and exploration of environmental policy instruments and policy integration;
- Resources to support community, local government, and SME initiatives e.g. public environmental research grants or business incubators;

- Building a clear business case within organisations to engage in ecological modernization;
- Continuation and expansion of community environmental education schemes;
- The development and penetration of environmental products and services into the market and strategies that support the development of environmental industries (e.g. business registers, product development).

These activities should feed into integrated and targeted formal actions at the regional scale to boost sustainable business development and innovative activities supported by clear regional indicators. There is a clear signal from the case studies that the natural advantage requires intervention – the transformational activities identify some of these strategies including networks, integrated economic and environmental strategies, applied research, resources and regulatory reform to level the playing field. These are expanded below. External influences are a significant influence in regional development, and include policy initiatives from high level government such as green building regulations or emissions trading. As a result of preparatory and transformational activities, regional natural advantage outputs evolve. These outputs, as identified in the initial model, include cleaner production, improved regional innovation, reduced impact and enhanced employment growth. The inclusion of feedback loops into the model highlights the iterative processes revealed by the case studies. Individuals and organisations learn over time as a result of preparatory and transformative measures and adapt institutions and behaviors. Feedbacks of information, resources and knowledge flow from the preparatory activities, transformative activities and outputs – this represents a cycle of learning, adaptive management, and continual improvement. The reform of the model has therefore shifted from a simple time based concept to a process driven soft systems approach that recognises that developing the natural advantage involves cycles of learning, experimentation and adaptation. This improved model can be used as the basis for further research, policy development, and strategic planning for sustainable activities at the regional scale, irrespective of location.

6.2. Transformative activities and opportunities to drive the natural advantage through regions

The transformational activities in Fig. 3 represent the primary instruments for implementing the natural advantage in regional development. The concept should not operate in isolation – the focus is an integrating strategy to link economic and environmental planning. For many years economic planning has progressed separately from sustainability planning. The case studies highlight there are benefits to planning regional economic strategies in line with sustainability and opportunities are emerging as regions engage in predominantly preparatory, and to a minor extent, transformative activities. While both regions have firms that specifically identify as sustainable businesses, the natural advantage concept can apply to all activities across the economic landscape. While many sustainable businesses are innovators and early adopters, this sector is still small as a proportion of total firms. As natural advantage takes hold both the sustainable industry sector and the activities of other traditional sectors will co-develop. The point is that applies to the emerging sustainability sector and traditional sectors in the regional landscape.

The main recommendation of this paper is that local authorities should explore the linking of sustainable development, innovation and economic development in their regions through the development of natural advantage action plans. Plans should transform

local businesses, grow the sustainable industry base, support environmental innovation, focus on local issues and regional strengths, and aim to support the development of environmental products and services. Based on the list of transformative activities in Fig. 3, policy mechanisms include:

6.2.1. Strengthening of sustainable business networks

Sustainable business networks provide a means for knowledge transfer and capacity building between stakeholders. A sustainable business network would have partners from SMEs, government, education, research and community organisations. A sustainable business network encourages collaboration and exchange of resources, ideas and opportunities, policy feedback and engagement, and building practical business and research opportunities. Members of a sustainable business network should be committed to the development of a sustainable industries sector and driving the social change necessary for pushing sustainable development into society. In a functioning network where everyone has something to gain and something to offer.

6.2.2. Support the role of environmental education

The case studies consistently identified the critical role of public, private and community environmental education in generating support and ideas that lead to the creation of sustainable businesses. Education plays an important role in developing awareness in the community of sustainable lifestyles and can increase the demand for environmental products and services. It is recommended that environmental education strategies and programs extend to cover local businesses communities and SMEs.

6.2.3. Develop local accreditation schemes

The evidence from the research suggests that regional accreditation schemes provide an incentive for organisations to explore sustainability in the context of their operations and promote actions for practical improvements. Although further research is required on the effectiveness of the accreditation process and outcomes, the study notes that regional branding, marketing, promotion and support from local government and businesses create incentives for engagement. It is important that any accreditation scheme is robust, exclusive, transparent, and provides clear benefits.

6.2.4. Regulatory reform and policy integration within government to support the sustainable industry sector

Policy support and integration from public authorities is necessary for the continuing growth of the sustainable industry sector. The sector, while creating investment and employment in local areas, contributes to broader societal goals through producing environmental goods and services and reducing environmental impacts. Supporting this sector therefore achieves the multiple policy goals for environment and employment. A policy reform agenda could move forwards on several fronts within local and regional decision making bodies. Key areas of action include:

- Building natural advantage concepts into local and regional environmental and sustainability strategies.
- Integration of economic development, employment and sustainability strategies.
- Updating State of the Environment reporting to include sustainable business information.
- Develop triple bottom line assessment tools for local government and integrate reporting at the regional scale.
- Identify resources for sustainable business networks, open days, accreditation schemes, and business incubators.

- Develop and reform the innovation agenda to ensure SMEs are getting appropriate support and assistance to compete in the knowledge economy.
- Support community demand for resource and energy efficiency and explore links to schemes such as emissions trading, subsidies and research grants.
- Regulatory reform that boosts the natural advantage agenda, for example, the reform of building codes for eco-efficiency and greener housing.

6.2.5. Creating a research agenda

There is a need for research into the natural advantage concept and the tools that can drive it forward as a mechanism for regional development. We have identified further research questions that include:

- Mapping the terrain – identifying sustainable businesses activities, networks, and firms.
- Surveys of regions covering urban, suburban, and rural areas at an international scale
- Understanding the challenges for the implementation of the natural advantage in regions with different social, economic and environmental conditions.
- Review the application of different methodological instruments to explore the natural advantage concept
- Development of regional natural advantage indicators and benchmarks.
- Comprehensive review of the influence and effectiveness of regional, provincial and national policies in progressing the natural advantage across different countries.

The results demonstrate the benefits of developing sustainable business activities. Environmental innovation in particular is emerging as a field of competitive advantage as a vehicle for increasing resource efficiency, reducing waste, opening new markets and boosting knowledge capacity that can be at the forefront of building a sustainable economy post financial crisis. This research takes the issue a step further by looking at the local and regional scale as a means of practically implementing the natural advantage and linking it to regional development. It anticipates that this message will increasingly resonate with policy makers, business leaders and the community in finding solutions to critical issues such as climate change and biodiversity loss.

What does this mean for the future and for international regions? First, there is a clear need for research to investigate the potential and dynamics of natural advantage type initiatives across different regions with unique mixes of social, economic and environmental issues. Does the common framework hold and is it applicable across regions? Second, how far advanced are natural advantage initiatives? What works where and why? Are national dialogues on the greening of economies matched by activity at local and regional scales? There is clearly a lot more work to be done, but it is the view of this paper that in many regions around the world, the first steps are being taken to develop the natural advantage. The message should be clear – the old debate over environment versus development is redundant.

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