

ADDRESSING BUSINESS FROM A SOCIAL-ECOLOGICAL PERSPECTIVE TO UNDERSTAND AND DEAL WITH RISK AND RESILIENCE

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ABSTRACT

Corporate sustainability, as currently practiced, is largely directed at reducing direct and immediate environmental impacts in terms of resource consumption and waste emissions. Despite two decades of engagement with corporate sustainability, global indicators show that the impacts of human enterprises continue to threaten global economic security and sound environmental management. The Millennium Ecosystem Assessment found that ecosystems have declined more rapidly and extensively over the past fifty years than at any other comparable time in human history. The Ecological Footprint indicator suggests that humanity's demand on nature exceeds the planet's ability to supply natural resources by over a quarter. Since business is dependent on ecosystem services for the provision of clean water, air, productive soils and other natural resources it is imperative to understand the complex landscape in which the business operate and how global change can have a devastating economic consequences. The impacts of Hurricane Katrina in 2005, which cost the US economy in the region of \$150 Billion, were greatly exacerbated by the degradation of regulating ecosystems such as wetlands, river systems and natural flood plains. On the other hand, local impacts of the Indian Ocean Tsunami of 2004, which killed more than 70,000 people and cost the area an estimated more than \$10 Billion, were greatly reduced in areas where healthy mangrove ecosystems had been maintained. The reality is that corporations today are facing unanticipated risks to business operations due to the deterioration of social-ecological systems upon which they depend. The immediate action for business is how to relate to today's challenges such as pollution, rising temperatures, water shortage and crop failure to growing business activities in order to achieve economic sustainability. The complexity of the challenges facing the existence of businesses, especially in terms of fundamental uncertainty as a result of global change and unpredictability, requires a fundamental shift in the way business is conducted and how they understand and implement sustainability. Instead of reducing practices that are perceived to be unsustainable, businesses should rather be strengthening sustainability systemic underpinnings. While the concepts of resilience, shared risk, uncertainty, adaptation and ecosystem stewardship are traction, the practical application of these concepts remains poorly understood and practised. In this paper we examine the research the CSIR is doing that will develop novel approaches and tools (repackaging old tools and the development of new tools) enabling corporations to understand, quantitatively assess and strategically respond to the social-ecological risks and opportunities that underpin their business; thereby increasing their business resilience and adaptation abilities in an uncertain and changing environment.

INTRODUCTION: THE BUSINESS CHALLENGE

The basic and most fundamental purpose of business is to provide continually improving goods and services for a growing population at prices that they can afford (WBCSD, 2006). By providing the goods and services demanded by the public, businesses fulfil many vital

social needs. However, in doing so, be it because of the resources they consume, the processes that they apply or the products that they manufacture in order to meet growing demands, business activities have been viewed as major contributors to environmental destruction and degradation (Welford and Gouldson, 1993). This infers that business activities have been mainly about “profits at any costs” even though the concept of sustainability and responsible business practices has been a global objective since the release of the Brundlandt report in 1987.

The increasing expectation that businesses should contribute towards sustainable development is evident in primary multilateral agreements on sustainable development. For example, the OECD guidelines for multinationals, Kyoto principles, Global Sullivan Principles, to name a few, which are largely driven by the aspirational principles and compacts developed since the first earth summit in Rio de Janeiro, Brazil in 1992 (e.g. Johannesburg plan for implementation, Millennium Development Goals, UN Global Compact, Kyoto protocol etc) (Freemantle, 2010; Hamann, 2008). As a result, alternatives to the traditional profit and growth maximization models used by business have been rapidly developing. An evolving corporate management paradigm referred to as “corporate sustainability” has developed which, whilst recognising that profits and growth are important, also requires that business address societal goals which specifically relate to sustainable development- environmental protection, social justice / equity, and economic development (Wilson, 2003).

Despite two decades of engagement with corporate sustainability, global indicators imply that the impacts of human enterprises continue to threaten global economic security and sound environmental management. The Millennium Ecosystem Assessment found that ecosystems have declined more rapidly and extensively over the past fifty years than at any other comparable time in human history (Millennium Ecosystem Assessment, 2003). In addition, the Ecological Footprint indicator suggests that humanity’s demand on nature exceeds the planets ability to supply natural resources by over a quarter (World Wildlife Fund, 2008). These statistics continue to worsen and thereby threaten the objectivity of sustainability raising issues about the viability of social and environmental support systems and the consequent affects for society and business. Since business is dependent on ecosystem services for the provision of clean water, air, productive soils and other natural resources it is imperative to understand the complex landscape in which the business operate and how global change can have a devastating economic consequences. The impacts of Hurricane Katrina in 2005, which cost the US economy in the region of \$150 Billion, were greatly exacerbated by the degradation of regulating ecosystems such as wetlands, river systems and natural flood plains. On the other hand, local impacts of the Indian Ocean Tsunami of 2004, which killed more than 70,000 people and cost the area an estimated more than \$10 Billion, were greatly reduced in areas where healthy mangrove ecosystems had been maintained (Constanza, 2007).

The reality is that business today are facing unprecedented pressures brought by new laws, regulations, standards and managing corporate reputation (Freemantle, 2010). Most importantly, however, the deterioration and unpredictability of global change to ecosystems upon which business activities depend are introducing unexpected risks and uncertainty to their so-called triple-bottom line and threatening their continued existence. The immediate action for business is how to respond to today’s global risk challenges, such as pollution, threats of rising temperatures, water shortage and crop failure, in order to achieve economic sustainability (WBCSD, 2009). This paper puts forward a further evolution of the corporate sustainability paradigm in which instead of reducing practices that are perceived to be unsustainable, business should rather be strengthening their understanding of the complex interaction within / between the social and ecological systems within which they operate to address their business risk and thereby increase the resilience of their business operations.

PUTTING SUSTAINABILITY INTO PERSPECTIVE

Sustainability has many definitions mainly interpreted to the goals and needs of the individual. The business community has been most active in advocating its interpretation and utilising the concept for its own benefit (mainly that of economic growth) yet the concept is still poorly understood and implemented. From recent research undertaken by the CSIR (Haywood *et al.*, 2010) it is clear that the complexity of the challenges facing the existence of business especially in terms of fundamental uncertainty as a result of global change and unpredictability, requires a shift in the way business is conducted and how they understand and implement sustainability. With the global economic crisis, the over utilisation and depletion of natural resources and the uncertainty of global changes, sustainability is now more about the ability of a system to survive over time.

The system referred to is that of which we commonly split into two separate systems; the natural system (biophysical aspects) and the social system (socio-economic aspects). From an ecological perspective, business is dependent on ecosystem services such as the provision of clean water and air, and the regulation of storms and flooding. From a social perspective, business is dependent on stable, healthy and educated societies for the provision of productive employees; as supportive neighbours and stakeholders to business; and as economically active consumers of goods and services produced by business (Freemantle, 2010). Despite the clear link between ecological health and social well being corporate sustainability practices have, for the most part, remained fragmented, non-strategic, and insular: in other words, content with just looking 'less bad'. The essential element that is failing business long term sustainability is their understanding and perception of the interconnectedness between society and the ecosystem they depend. A classical South African example would be the lack of service delivery by local municipalities. Municipal service delivery has not been able to keep pace with the growing needs of the influx of people wishing to capitalise on this potential. This example clearly illustrates the complex nature of the social and economic development and the potential for unintended consequences. More importantly, it also illustrates the link between social systems and the management of underlying natural resource base and ecosystems services that will be needed to sustain changes in social structure and systems.

Sustaining a system requires analysis and understanding of feedbacks and more generally the dynamics of the interrelations between the ecological system and the social system for the integrated understanding of humans-in-nature. We refer to this interrelationship as the social-ecological system. Responding to the challenges of sustainability thereby requires insight into the characteristics of the social-ecological system.

A SYSTEMIC APPROACH TO ADDRESSING BUSINESS SUSTAINABILITY

What has changed substantially in business in the last couple of years is the understanding that global risks are now tightly interconnected and shocks and vulnerabilities are truly global and thus there is a greater need for an integrated and more systemic approach to risk management at the society-ecosystem interface (Global Risk Network, 2010). This is mainly because business fails to appreciate that they operate in an open social-ecological system that is shared with other users. In this regard, business needs to appreciate and comprehend that, just as individuals and societal institutions they are embedded in the cyclical processes of the social-ecological system in which they operate (Capra, 1997). Business must divorce itself from thinking of being separate, and in competition with the social-ecological system in which they operate, to accepting itself as being part of, and co-evolving within the system (Du Plessis, 2006). Business requires a better understanding of both their dependence on the system for the resources and the wastes it absorbs, the surety of supply of these and their role in promoting system-wide security of such resources and services. Sustainability strategies within a business thereby needs to adopt a broad, systems thinking approach in which all operational aspects of the business are addressed from an understanding the of interconnectedness of the social and environmental interface in which the business operates. A systems approach will also enable sustainability strategies to effectively build resilience

within the business in which to help withstand unpredictable environmental and external shocks. In turn, this will help businesses to make more informed and appropriate decisions regarding the nature and scale of response required to achieve long-term sustainability.

PRINCIPLES OF SOCIAL-ECOLOGICAL SYSTEMS AND THEIR RELATION TO BUSINESS

The key principles of social-ecological systems are that they are complex and adaptive with properties of self organisation and emergence. A shift is happening in systems research from prediction and control to understanding the resilience of a system in order to provide a foundation for adaptive systems management (Walker *et al.*, 2002; Burns *et al.*, 2006, Korhonen and Seager, 2008).

The concept of resilience has emerged as a critical characteristic of complex systems. Social-ecological system resilience is defined as the capacity of a system to absorb disturbance and adapt to change so as still to retain the same function, structure and identity (Walker *et al.*, 2004; Walker *et al.*, 2006). More specifically in a business context, business resilience as the capacity for a business to survive, adapt and grow in the face of turbulent change. Business management can destroy or build resilience, depending in how the social-ecological system organised itself in response to management actions (Carpenter *et al.*, 2001; Holling, 2001). Faced with a dynamic and unpredictable business environment, management theorists are increasingly identifying the need for resilience (Hamel and Valikangas, 2003).

Resilience is, therefore, the potential of a social-ecological system, in which a business operates, to remain in a particular configuration and to maintain its feedbacks and functions, but also to reorganise itself following disturbance-driven change (Walker *et al.*, 2006). These systems are thereby able to cope, adapt or reorganise themselves without sacrificing the provision of ecosystem services (Folke *et al.*, 2002). Resilience also emphasises adaptive capacity, which may lead to a new equilibrium (Walker *et al.*, 2006). Adaptive capacity is an aspect of resilience that reflects learning, flexibility, problem solving and store knowledge. Resilient business systems are thereby able to grow in the face of uncertainty and unforeseen disruptions. In January 2009 MIT Sloan Management Review undertook an interview with Jeff Seabright, the Coco-Cola Company's vice president of environment and water resources. Seabright explained that water quality and quantity was one of Coco-Cola's biggest risks to the operations of the company. Coco-Cola decided that instead of being reactive to the water risk as it presented itself in each country that they would rather tackle the challenge and understand the full range of issues around water and turn a risk into an opportunity. This resulted in the compilation of a global water strategy in which Coco-Cola adopt a systems approach to contribute to the management of water resources in the communities in which they operate. More specifically, through this approach, the company is acknowledging the importance of shared risk as they are not the only ones dependent upon and influencing a limited resource within a social-ecological system.

In summary, risk is about understanding the system in which you operate, understanding the resilience of that system and how best to adapt to ensure continued survival and economic viability within the resilient system. The key element with risk in relation to social-ecological system resilience is to understand where resilience resides in the system, and when and how it can be lost or gained (Walker *et al.*, 2002).

CONCLUSION

The CSIR is currently investigating the development of novel approaches and tools (repackaging old tools and the development of new tools) enabling business to understand, quantitatively assess and strategically respond to the social-ecological risks and opportunities that underpin their business; thereby increasing their business resilience and adaptation abilities in an uncertain and changing environment. This is by no means an easy task involving modelling and mapping a social-ecological system in which a business operates

(this is data intensive and in most instances data is extremely limited); identifying the operational risks and then mapping them spatially within the landscape, identifying potential points of resilience (social, ecological and economic) and how these points would be affected by different operational scenarios of the business within the landscape in which it operates; determining how this information could fit into strategic and operational elements of the business in order to assist in minimising risk and maximising financial opportunities. This research is being undertaken in the form of defined case studies that will build the business case and clearly communicate the benefits of a social-ecological systems approach to long-term corporate sustainability and decision making. This exciting and emerging area of research is driven by unprecedented pressure on businesses to better understand the systems in which they operate. Through strong corporate partnerships and a good grasp on social-ecological systems approaches an array of practical tools to grapple with complexity, uncertainty, and resilience of business within the context of achieving sustainability will be achieved.

REFERENCES

Burns M, Audouin M and Weaver A (2006) Advancing sustainability science in South Africa. *South African Journal of Science*, vol 102, no 9/10, pp 379-384.

Capra F (1997). *The web of life: A synthesis of mind and matter*. Flamingo: London.

Carpenter SR, Walker B, Andries JM and Abel N (2001). From metaphor to measurement: resilience of what to what? *Ecosystems*, vol 4, pp 765-781.

Constanza R and Farley J (2007) Ecological economics of coastal disasters: An introduction to the special issue. *Ecological Economic*, vol 63, pp 249-254

Du Plessis C (2006). *Thinking about the day after tomorrow: New perspectives on sustainable building*. Paper published in the proceedings of the conference on Rethinking Sustainable Construction 2006: Next Generation Green Buildings (12th Rinker International Conference), held in Sarasota, Florida, USA, September 19-22, 2006.

Folke C, Carpenter S, Elmqvist T, Gunderson L, Holling CS and Walker B (2002) Resilience and sustainable development: Building adaptive capacity in a world of transformations. *Ambio*, vol 31, no 5, pp 437-440.

Freemantle, A. (2010) What drives sustainable business today? The Dialogue. Sustainability Review. The quarterly review of sustainability in South African business. Issue 1: April 2010. Financial Mail.

Hamann, R. (2008) Introducing corporate citizenship. In *The business of sustainable development in Africa-human rights, partnerships, alternative business models*. Eds Hamann, R., Woolman, S., Sprague, C. Unisa Press Pretoria. ISBN 978-86888-527-5

Hamel G and Välikangas L (2003) *The quest for resilience*. Harvard Business Review. September 2003.

Haywood LK, Brent AC, Trotter DH and Wise R (2010) Corporate sustainability: A social-ecological research agenda for South African business. *Journal of Contemporary Management*, vol 7, pp 325-345.

Holling CS (2001) Understanding the complexity of economic, ecological and social systems. *Ecosystems*, vol 4, pp 309-405.

Korhonen J and Seager TP (2008) Beyond Eco-efficiency: a resilience perspective. *Business Strategy and the Environment*, vol 17, pp 411-419.

Millennium Ecosystem Assessment (2003) *Ecosystems and human well-being*. Island Press: Washington, D.C., USA

Walker B, Carpenter S, Anderies J, Abel N, Cumming G, Janssen M, Lebel L, Norberg J, Peterson GD and Pritchard R (2002) Resilience management in social-ecological systems: a working hypothesis for a participatory approach. *Conservation Ecology*, vol 6, no 1, pp 14 [online] URL: <http://www.consecol.org/vol6/iss1/art14>

Walker B, Holling CS, Carpenter SR and Kinzig A (2004) Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society*, vol 9, no 2, pp 5 [online] URL: <http://www.ecologyandsociety.org/vol9/iss2/art5>

Walker B, Gunderson L, Kinzig A, Folke C, Carpenter S and Schultz L (2006) A handful of heuristics and some propositions for understanding resilience in social-ecological systems. *Ecology and Society*, vol 11, no 2, pp13 [online] URL: <http://www.ecologyandsociety.org/vol11/iss1/art13>

Welford R and Gouldson A (1993) *Environmental Management and Business Strategy*. Pitman Publishing: London

Wilson, M. (2003) Corporate Sustainability: What it is and where does it come from? Ivey Business Journal. March/ April. # 9B03TB06

World Business Council for Sustainable Development (WBCSD) (2006) *From Challenge to Opportunity. The role of business in tomorrow's society*. Conches-Geneva: WBCSD.

World Business Council for Sustainable Development (WBCSD) (2009) *Water, Energy and Climate Change - A contribution from the business community*. Conches-Geneva: WBCSD.

World Wildlife Fund (2008) *Living Planet Report 2008*. WWF International: Switzerland