Bowe C, der Horst DV. 2016 Business valuation of natural capital: learning by doing. Institute for Chartered Accountant England and Wales (ICAEW). Rethinking capital publication, Series 2 Natural Capital. http://www.icaew.com/en/technical/sustainability/rethinking-capitals/upcoming-publication

Business valuation of natural capital: learning by doing

Colm Bowe [a] and Dan van der Horst [b]

[a]Liverpool John Moores University Contact: c.bowe@ljmu.ac.uk

[b]University of Edinburgh Contact: dan.vanderhorst@ed.ac.uk

Businesses are starting to take an interest in the natural capital agenda but much more work is needed to map their impacts and dependence on ecosystem services. Business greening organisations argue that such work has the potential to engage influential stakeholders in achieving sustainable outcomes (WBCSD, 2011; Cranston et al 2015). However, the economic valuation of ecosystem services/natural capital has also received criticism from sections of the academic community (e.g. Redford and Adams 2009; Gomez-Baggethun and Ruiz-Perez 2011) and the press (e.g. Monbiot 2014). Such criticism can be helpful in identifying potential pitfalls and areas that may require wider involvement and engagement of stakeholders, further thought and development of methods and policies.

In this article, we suggest that addressing the lack of real world examples of valuation by business of natural capital may improve understanding of such cases and develop ideas and thinking to address some of these issues. The adoption of valuation as a logical next step in social and environmental business accounting is hampered by the absence of a fully tried and tested framework to assist and guide companies in natural capital valuation. Whilst there have been some early efforts to develop such frameworks include the ongoing work in working towards a natural capital protocol (WBCSD, 2011; CISL 2013c; Maxwell et al 2014), there is a lack of 'real world' case studies to build the evidence of and the confidence in their effectiveness. In this article we reflect on what we learned from working with SABMiller on such a 'real world' case study (Bowe et al 2013; Bowe and van der Horst 2015). Before we do so, we provide a brief background to the emerging trend of valuing nature and its contestations.

Traditional conservation approaches alone have not been sufficient to reverse global trends in biodiversity loss, brought about by the patterns of the global economy, characterized by ever-increasing demands on natural capital stocks, ecosystem services, and biodiversity (Guo et al., 2010; Krausmann et al., 2009 in Gomez-Baggethun and Ruiz-Perez 2011). For a long time (nature) conservation and (economic) development have been at loggerheads, with proponents of either side occupying seemingly irreconcilable ideological positions. But recent years have seen the emergence of the 'new conservation' paradigm (Marvier, 2015), characterised by the embrace of tools such as environmental accounting and non-market valuation which open the door for a more analytical assessment of the complex interdependencies between the economy and the environment and enable private and public sector decision makers to internalise the environmental costs and benefits of specific development interventions.

Nature underpins the human economy (Redford and Adams 2009). The fact we are dependent on services and goods provided from the natural environment, termed ecosystem services or natural capital had been well highlighted (MEA 2005). The concept of ecosystem services has been described as a metaphor to reflect societal dependencies on ecosystems (Norgaard 2010). This concept has developed into an attempt to value ecosystem services in monetary terms (Gomez-

Baggethun and Ruiz-Perez, 2011). Expressing this value in monetary terms allows aspects of nature biodiversity and ecosystems to be considered in traditional economic tools (like cost-benefit analysis) used in private and public sector decision-making. Having access to tools for assessing the impacts and dependencies on natural capital within the supply chain would allow businesses to take pro-environmental decisions which make business sense in the longer term. These tools can reveal important information on the costs of inputs, securing supplies, regulatory demands, reputation, maintaining sustainable operations and income generation (WBCSD, 2011; Cranston et al 2015). In short, valuation of a company's environmental and social impacts (positive and negative), will yield relevant information for business strategy. Indeed, creating positive local externalities through (informed and progressive) supply chain management lies at the heart of what Michael Porter, the Harvard Business School guru in Business Strategy calls 'creating shared value'. Clearly a company cannot hope to create shared value, without a detailed assessment of the external impacts of different management and investment options.

This does not mean that valuation of ecosystem services and natural capital is easy or free of controversy. Recent papers have provided a summary of the critiques to the concept and approach (Redford and Adams 2009; Schroter et al 2014; Adams 2015). These include ethical arguments that the concept is anthropogenic focused considering nature's values only as what it can do for humans, negating the intrinsic value. Concerns about who are the likely beneficiaries and from which ecosystem services will they benefit; on this basis will landscapes be managed to prioritise certain ecosystem services over others. There are also concerns about whether we understand the link between biodiversity, ecosystem processes and the provision of ecosystem services (Schroter et al 2014). Some have suggested that ecosystem services represent just a fraction of biodiversity (Redford and Adams 2011), whilst others have observed that for a number of regulatory and provisioning services sufficient evidence exists to conclude that biodiversity influences or correlates with ecosystem services (Cardinale *et al* 2012).

Many of the criticisms focus around the economic framing and valuation aspect both at a conceptual and methodological level, including concerns about trust in the consultancies and companies deploying such tools. There is political concern that valuation is a precondition of privatisation and commercialisation under the overarching banner of commoditisation (Gomez-Baggethun and Ruiz-Perez 2011). Mechanisms such as Payments for Ecosystem Services (PES) and ecosystem service markets will affect how landscapes are managed, raising contentious issues of power, ownership and responsibility and the uneven (unfair?) distribution of benefits. Some argue this commodification would open nature to the influence of financial speculation. In terms of methodology, concerns have been voiced about valuation being indirectly dependent on market prices and therefore influenced by market forces or in contrast being based on virtual markets, which are difficult for the respondent to understand (Chee 2004). Other concerns highlight the value of ecosystem services being dependent on locality in relation to human population, meaning that nature close to larger human population centres will be assigned a higher value (Redford and Adams 2009). This can mean that rural and minority ethnic groups will lose out to urban groups who have different cultural perceptions of the value of ecosystem services. In other words, there is a dilemma about who should be valuing and whose valuation should be considered 'right' (Kenner 2014). Other recurring issues include the setting or discounting rates and calculating Net Present Value (NPV), and understanding how valuation will work with dynamic and complex systems and system resilience. But setting aside the question of how (un)desirable commodification is (which clearly depends to an important extent on what is actually traded and the market conditions and rules under which it is traded), it is important to recognise that relatively few valuation studies have actually been carried out for the purpose of commodification. For example Costanza's et al (1997) (in)famous (gu)estimate

of the total economic value of the world's ecosystem services did not serve for the purpose of putting a price tag on our beautiful planet (which only extra-terrestrial zillionaires could afford), but rather to illustrate the fact that mother goose is worth more alive than the sum of all the golden eggs she has laid for us so far.

We would argue that valuation is neither like land mines (inherently bad) nor like penicillin (inherently good); like all decision support tools, its value to society depends entirely on how and to what purpose it is being used. So whilst we acknowledge the above-mentioned controversies and we steer clear from valuation for the purpose of creating new types of commodities from nature, we do argue in favour of valuation for the purpose of better informing existing decision dilemmas within the private and public sector.

In our recent study (Bowe et al 2013; Bowe and van der Horst 2015), we assessed the impacts of corporate agricultural extension services in Rajasthan India, a semi-arid area with an agricultural economy that is highly dependent on irrigation from a depleted aquifer. Our case study concerned SABMiller's efforts to encourage local farmers to grow a new crop, malting barley, for the company's regional brewing operation. The company employed farm advisors who visited independent smallholder farmers, providing agronomic advice about the benefits and best practices to grow malting barley. In order to win the trust and raise the interest of local farmers, most farm advisors provided agronomic advice for the whole farm, not just for malting barley. Focus group meetings with these farm advisors (conducted by an external consultant) and secondary data showed that the farming advice resulted in farmers shifting from more water demanding crops to malting barley, and improving yields of non-barley crops relative to agronomic inputs such as water and fertiliser. This data was used to develop a historical pre-company scenario, a current non-company scenario (baseline) and a current company scenario. Biophysical quantification of the impacts of the farming advice (based on a comparison of the baseline to the company scenario) identified a lower ground water use, grey water and greenhouse gas externalities for farmers who adopted malting barley as a new crop. In addition to these reductions in environmental externalities, these farmers also enjoyed a significant increase in income. Monetary values were assigned to the change in water use based on the extra cost of pumping ground water from a greater depth and the costs of replacing wells that had fallen dry due to receding ground water levels. The annual economic value assigned to the reduction in water externalities exceeded the salary of the extension services employed by SABMiller. This indicates that under full social and environmental accounting, the extension services (i.e. the employment of farm advisors) could be seen as a profit-making unit of the company. This environmental profit is shared with the small-scale farmers in the supply chain and all (water using) citizens in the region where the company operations, and its customers, are based. As one of the few foreign, industrial water users in an increasingly water scarce region, SABMiller's brewing operations faced a substantial long term reputational risk, but through their malting barley operations they are able to play a constructive and leading role in regional farming adaptation and sustainable intensification; a clear example of 'creating shared value'.

More broadly, our study suggests that in cases where farmer advice significantly increases farmer income, progressive payments for ecosystem services (PES) schemes could be developed, enticing farmers to make further environmentally friendly management changes based on targeted agronomic advice. This is beneficial to the farmers, the environment, the relational capital and regional reputation of the company. Such schemes could be seen as alternative routes improved management of our natural resources, informed by valuation studies such as ours and grounded in existing and mutually-dependent relations along the supply chain.

The study also identified some interesting aspects relating to data availability and methodological development. Our study appeared to create increased interactions within the company across various levels and areas of expertise i.e. communications between sustainability and operational teams and with academic institutions. A focus group run with the farm extension workers allowed for a quick, affordable and effective knowledge transfer of information that already existed within the business to agronomic, operational and sustainability teams. This is consistent with the wider observation that the study of ecosystem services is highly multidisciplinary, requiring a combination of ecology, economics and social aspects (Schroter et al., 2014).

Our study (Bowe et al 2013; Bowe and van der Horst 2015) has also contributed to developing assessment frameworks for Natural Capital accounting and valuation. It was the key case study in the development of E.Valu.A.Te guide and tool (CISL 2013a; CISL 2013b). Contributions to the guide were also made from other case studies conducted through the Valuing Nature Network (VNN) 'Right Value for Externalities' Project. The guide (CISL 2013c) provides information on how to perform an on-site assessment of corporate externalities taking users through a step-by-step approach. The Practical Guide builds upon existing initiatives, frameworks and tools, including those of WBCSD (2011), Trucost/TEEB for Business (TEEB for Business 2013) and the BAT BORA tool (BAT 2012).

More studies using real world examples will not only help business understand how these methods can inform decision making but also allows us to continue to uncover, address, refine and improve our shared understanding of the concepts, processes and methodologies. Such studies could explore when it may and may not be appropriate to assign economic values to all biophysical or social indicators; in some cases a study may require information to be presented and communicated in other, more culturally or contextually suitable units (Schroter et al 2014). Decisions about who should conduct valuation (Kenner 2014) and how valuations from various stakeholders and metrics could be considered in unison can be explored through new real world case studies with those stakeholders. With active research and engagement built into the assessment, there will be a continued drive to develop our understanding of the more fundamental aspects of the complex ecosystems we are part of and interact with, such as the particular interdependencies between biodiversity, ecosystem services and the depletion of non-biotic natural resources. The increased use of the Natural Capital concept may be helpful in that respect. More private sector involvement in such case studies is heavily dependent on the skills, enthusiasm and innovative capacity of professionals in accounting and valuation, whether they work within the company or in consultancy, research and training.

References

Bowe C., van der Horst, and Meghwanshi C. (2013). Assessing the externalities of SABMiller's barley extension program in Rajasthan.

Bowe C., and van der Horst D. (2015). Positive externalities, knowledge exchange and corporate farm extension services; a case study on creating shared value in a water scarce area. Ecosystem Services 15, 1-10.

BAT (2012) The Biodiversity Risk and Opportunity Assessment (BROA) Handbook, The British American Tobacco Biodiversity Partnership: British American Tobacco, Earthwatch Institute, Fauna & Flora International, Tropical Biology Association.

R. Costanza, R. d'Arge, R.S. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R.V. O'Neill, J. Paruelo, R.G. Raskin, P. Sutton, M. van den Belt (1997). The value of the world's ecosystem services and natural capital Nature, 387, 253–260

Cardinale, B.J., Duffy, J.E., Gonzalez, A. et al. (2012) Biodiversity loss and its impact on humanity. Nature, 486, 59-67.

Chee Y.E. (2004). An ecological perspective on the valuation of ecosystem services Biological Conservation 120, 549–565.

CISL (2013a). E.Valu.A.Te Summary and Signposting University of Cambridge Institute for Sustainability Leadership (CISL).

CISL (2013b). SABMiller Case Study: The (Sustainable) Business Case for Natural Capital Valuation. University of Cambridge Institute for Sustainability Leadership (CISL).

CISL (2013c). E.Valu.A.Te Practical Guide University of Cambridge Institute for Sustainability Leadership (CISL).

CISL (2015). Doing Business with Nature. Copyright ©2015 University of Cambridge Institute for Sustainability Leadership (CISL). Some rights reserved.

Gomez-Baggethun E. and Ruiz-Perez M. 2011. Economic valuation and the commodification of ecosystem services. Progress in Physical Geography. 35(5) 613–628 doi: 10.1177/0309133311421708

Guo Z., Zhang L., and Li Y (2010). Increased dependence of humans on ecosystem services and biodiversity. PLoS ONE 5: 1–7.

Kenner D. (2014). Who should value nature? Sustainable Business Initiative – outside insights. ICAEW. Why Green Economy?

Krausmann F., Gingrich S., Eisenmenger N., Erb K-H., Haberl H., and Fischer-Kowalski M. (2009). Growth in global materials use, GDP and population during the 20th century. Ecological Economics 68: 2696–2705.

Marvier M. (2013). New Conservation, friend or foe to the traditional paradigm? http://www.snap.is/magazine/new-conservation-friend-or-foe/

Redford K.H. and Adams W.M. (2009). Payment for Ecosystem Services and the Challenge of Saving Nature Conservation Biology, 23 (4) 785-787. doi: 10.1111/j.1523-1739.2009.01271.x

Stern N.H. (2007). The economics of climate change: the Stern review. Cambridge University Press.

TEEB for Business (2013). Natural Capital at Risk: The Top 100 Externalities for Business Report.

Maxwell, D. McKenzie E. and Traldi R., (2014). Valuing Natural Capital in Business Towards a Harmonised Protocol. Natural Capital Coalition.

MEA. (2005) Ecosystems and human well-being: synthesis report. Island Press, Washington D.C., USA.

Monbiot G. (2015). Put a price on nature? We must stop this neoliberal road to ruin. George Monbiot's blog The Guardian (http://www.theguardian.com/environment/georgemonbiot/2014/jul/24/price-nature-neoliberal-capital-road-ruin) (accessed 18/05/2015)

Norgaard, R.B. (2010) Ecosystem services: from eyeopening metaphor to complexity blinder. Ecol. Econ., 69, 1219-1227. doi:10.1016/j.ecolecon.2009.11.009

WBCSD (2011). Guide to Corporate Ecosystem Evaluation - A framework for improving corporate decision-making. Copyright © World Business Council for Sustainable Development. April 2011.

Raymond, C.M., Singh, G.G., Benessaiah, K. et al. (2013) Ecosystem services and beyond: using multiple metaphors to understand human-environment relationships. Bioscience, 63, 536-546.

Schroter M. , van der Zanden E.H., van Oudenhoven A.P.E., Remme R.P., Serna-Chavez H.M., de Groot R.S. and Opdam P. (2014). Ecosystem Services as a Contested Concept: A Synthesis of Critique and Counter-Arguments. Conservation Letters, 7(6), 514–523 doi: 10.1111/conl.12091