Institution: London School of Economics and Political Science

Unit of Assessment: Geography, Environmental Studies and Archaeology

Title of case study: Natural capital accounting for a sustainable future

1. Summary of the impact (indicative maximum 100 words)

Many governments have pledged to better manage and protect vital natural resources in order to ensure that existing economic wealth and opportunities remain available to future generations. They have been hampered in doing so by the significant challenges involved in accounting for this 'natural capital'. LSE research has helped to address these challenges and in so doing has contributed to better stewardship of natural resources for a sustainable future. This has occurred at two levels - national and international. In the UK this research has had a direct impact on the shaping of the Government's environmental policy. At the international level it has contributed to World Bank guidance to its 188 member countries and informed the development and implementation of a City Biodiversity Index, which is being applied in over 400 cities worldwide.

2. Underpinning research (indicative maximum 500 words)

Research Insights and Outputs:
Historically, indicators used to measure economic assets and wealth have been developed using a strictly quantitative approach, including those developed to account for natural resources. LSE's initial research found that this purely technical perspective on how to 'build a better indicator set' is critical but not sufficient in the development and adoption of indicators to account for natural capital in policy-making contexts. Under the EU-funded "Promoting Action for Sustainability at the Local Level in Europe" (PASTILLE) project [1, 2], LSE research demonstrated the significance of the local context in determining which indicators are developed and, in particular, how the politics of the context shapes and transforms both the character and use of those indicators. This research therefore established the importance of complementing technical considerations with an understanding of the relevant political context in order to develop indicators that have a greater probability of being both influential in policy-making and effective in practice.

The technical challenge remains, however, a critical element of this work. Ultimately, constructing practical indicators that can meaningfully guide policy thinking requires building a robust foundation of understanding of the measurement of natural capital. In this respect, the LSE Unit examined how ideas about sustainability can be applied to project or policy appraisal and how challenges in valuation such as non-monetary benefits and irreversible losses can be considered in such assessments [3]. The Unit applied conceptual advances in the theory of sustainable development and natural capital accounting to empirical contexts such as deforestation, e.g. taking into account not only advances in technology and population growth but also the multiple benefits that forests provide that would be lost through deforestation [4]. The Unit identified the specific challenges inherent in valuing exhaustible resources and environmental degradation and discussed ways to measure progress in 'genuine saving' of natural resources [5]. The Unit also emphasised the importance of looking at the underlying ecosystem assets and not just the flow of current ecosystem services in understanding whether these services can be sustained and enjoyed into the future [6].

The distinctive contribution made through this research is thus:

- demonstrating the importance of considering the specific political context when developing indicators of natural capital that will be effective in practice
- analyzing the specific issues and challenges that arise in measuring and accounting for natural capital and bringing conceptual and empirical advances to bear in identifying ways in which these can be addressed.

Key researchers: Giles Atkinson joined LSE in January 1999. His part of the underpinning research was conducted from 2000 to 2010. Holman was at LSE from 2000 to 2002 and returned to the LSE in 2005. She carried out her part of the underpinning research from 2000-2002 with

Yvonne Rydin, who was at LSE until summer 2006 and grant holder for the PASTILLE project.

3. References to the research (indicative maximum of six references)

1. RYDIN, Y., N. HOLMAN, V. Hands and F. Sommer (2003) "Incorporating Sustainable Development Concerns into an Urban Regeneration Project: How Politics can Defeat Procedures", *Journal of Environmental Management*, 46(4): 545-561. DOI: 10.1080/0964056032000133152

2. Astleithner, F., A. Hamedinger, N. HOLMAN, and Y. RYDIN (2004) "Institutions and Indicators: The Discourse about Indicators in the Context of Sustainability*", Journal of Housing and the Built Environment*, 19(1):7-24. DOI: 10.1023/B:JOHO.0000017704.49593.00

3. Pearce, D.W., G. ATKINSON and S. Mourato (2006) *Cost-Benefit Analysis and the Environment: Recent Developments*, Paris: OECD. http://eprints.lse.ac.uk/2867

4. Hamilton, K. and G. ATKINSON (2006) *Wealth, Welfare and Sustainability: Advances in Measuring Sustainable Development*, Edward Elgar, Cheltenham. http://eprints.lse.ac.uk/32036

5. ATKINSON, G. and K. Hamilton (2007) "Progress Along the Path: Evolving Issues in the Measurement of Genuine Saving", *Environmental and Resource Economics*, 37: 43-61. DOI: 10.1007/s10640-007-9114-7

6. Bateman, I.J., G.M. Mace, C. Fezzi, G. ATKINSON and R.K. Turner (2011) "Economic Analysis for Ecosystem Service Assessments", *Environmental and Resource Economics*, 48(2): 177-218. DOI: 10.1007/s10640-010-9418-x

Evidence of quality: 1-2 and 5-6 are peer-reviewed papers in high quality journals; 3 is a highly cited (372 Google Scholar citations) OECD publication. Key Research Grant - European Union Framework 5 "PASTILLE project":• Principal investigator/grant holder: Prof. Y. Rydin (at UoA until summer 2006) • Period of grant: 01/03/2000 to 30/09/2002; Value of grant: €1,361,680

4. Details of the impact (indicative maximum 750 words)

Impact at the international level (United Nations and World Bank):

In 2009 Atkinson was commissioned by the World Bank to write a paper on the issues and challenges involved in the use of environmental valuation methods in official policy appraisals. The paper, titled "Greening the National Accounts: Challenges and Initial Practical Steps", served as input into processes on natural capital accounting being undertaken by the United Nations Statistical Office and was also disseminated by both the World Bank [A] and the UN Department of Economic and Social Affairs [B] as a guide for member countries. In the UK this report proved to be "a very useful reference in helping Defra [the Department for Environment Food and Rural Affairs] understand different perspectives on natural capital accounting, including the role and potential for application of economic valuation within an accounting framework. It has also informed the UK contribution to the review of the recent UN SEEA [System of Environmental-Economic Accounting] publication on Experimental Ecosystem Accounting" [C].

Following that project, in 2012 Atkinson was invited to serve as a member of the Policy and Technical Experts Committee (PTEC) providing guidance to the World Bank's Wealth Accounting and the Valuation of Ecosystem Services (WAVES) Partnership, which is assisting partner countries to implement natural capital accounting. He is a member of the Methodology Working Group, which is conducting its own research projects as well as advising on pilot projects designed to test proposed accounting methodologies in a number of partner countries [D].

The underpinning research has also had impact on the development and implementation of the United Nations Environment Program's (UNEP) City Biodiversity Index (CBI). The CBI is a pioneering self-assessment and monitoring tool designed to help cities better understand how they can improve their biodiversity conservation efforts. This tool helps cities to: engage with the issue of biodiversity; monitor and manage their biological resources; and raise awareness of biodiversity

amongst citizenry more widely. The full index is now being used in more than 100 cities worldwide, while a further 334 cities from five countries are using a truncated version.

LSE impact on the CBI was in the development of the set of indicators dedicated to governance with respect to biodiversity. Specifically, Nancy Holman was a key member of the Technical Task Force [2009-11] ensuring that indicators were clear and adaptable to individual city circumstances [E, F, G]. Holman translated the underpinning research into direct lessons for creating elements of the CBI. One insight was to design indicators so as to require 'competing' policy departments to exchange information and ideas before proceeding with the act of measurement. This creates a new network of policy actors around the issue of biodiversity and further embeds the idea into policy discourse.

This approach has demonstrated a direct impact on the biodiversity policy in the cities that applied the index. For example, in Lisbon, Portugal, the application of the CBI led directly to the development of a Biodiversity Strategy and Local Action Plan for Biodiversity [H]. Application of the CBI has also diversified, such that it is now used a) by city officials to set project priorities, b) by city planners in planning new cities, c) in environmental sustainability ranking systems, and d) by schools for their biodiversity audits. In addition, partnership networks are being created between local government, local communities and businesses to provide things like sustainable urban drainage systems, which are benefitting both the environment and partnership development. The beneficiaries of this impact on biodiversity indicator governance are thus not confined to UNEP and the Convention on Biological Diversity-Conference of the Parties (CBD-COP). Given its implementation across many cities and deliberate targeting towards communication to a public (city-based) audience, beneficiaries include many national and local stakeholders, including municipal and local governments, communities, businesses and citizens who will be affected in the present and the future.

Impact on UK environmental policy:
Within the UK, Atkinson has been involved in Government reviews and projects that have led to revision of the Government's assessment of its contribution to Sustainable Development (SD) and the way in which it accounts for and manages UK natural capital.

One of these reviews was conducted by the Government Economic Service (GES) Working Group on the Economics of Sustainable Development, which was comprised of representatives from across Whitehall departments and chaired by the Chief Economist of Defra. Dr. Atkinson was commissioned by this working group to provide an assessment of current UK practice on sustainability [H,I]. Grounding his findings and recommendations firmly within the underpinning research cited above, Atkinson proposed revision of the Sustainable Development (SD) Test required as part of the Impact Assessment that UK policy-makers must conduct for any proposed policy action. In particular, he recommended the incorporation of an 'asset check' that would keep track of key environmental assets and require policy-makers to give special consideration to the impact that a proposed policy would be likely to have on natural capital. This proposal featured prominently in both the GES Working Group's own recommendations in 2010 [I] and in the Natural Environment White Paper published by Defra in 2011 [J].

This work led to Atkinson's involvement in two separate research projects: a pilot study by Defra to define what an asset check might look like in practice, and further work on developing an asset check as part of the National Ecosystem Assessment Follow-On study (NEAFO). A piece of this involved gathering case studies and establishing what an additional focus on natural capital adds to 'conventional' ecosystem assessment. According to Defra's Deputy Director for Sustainable Land and Rural Evidence and Analysis, "the principle that impacts on key assets should be assessed and considered in decision-making has already influenced the development of specific appraisal guidance. Specifically, new impact assessment guidance recently published by Ofgem recommends combining valuation of environmental impacts with a broader assessment of the longer-term impacts of energy investments on critical natural stocks (as well as on GHG emission reduction targets)" [C,K: p. 23].

Defra's 2011 White Paper also announced the establishment of a Natural Capital Committee (NCC) reporting to the UK Economic Affairs Committee and chaired by the Chancellor. This committee was charged with advising HM Government on whether England's natural assets are being used unsustainably and on priority actions to take in addressing any identified problems and concerns. Atkinson was appointed a member of the NCC in May 2012 [L] and has been active in co-leading the NCC's work on improving accounting for natural capital. Atkinson's underpinning research on the practical issues and challenges in measuring natural capital, and particularly the benefits and costs associated with environmental loss and the 'saving' of natural resources, has been particularly relevant and influential in this work. In addition, in July 2012 the Office for National Statistics began a public consultation on a rationale and process for including the full value of natural capital in the UK Environmental Accounts by 2020. Dr Atkinson was one of the authors of the NCC's written response to this consultation. Some of the NCC's advice, most importantly the recommendation to develop parallel ecosystem accounts that maximise the opportunity to identify cross-cutting issues, has been incorporated in the ONS' published implementation Roadmap [C, M].

Wider Implications: LSE research on accounting for natural capital is helping to shape UK and World Bank environmental policy by proving a more robust accounting methodology. LSE work with the United Nations to develop a core biodiversity indicator set is being applied in cities worldwide and is aiding urban biodiversity conservation efforts.

5. Sources to corroborate the impact (indicative maximum of 10 references)

All Sources listed below can also be seen at https://apps.lse.ac.uk/impact/case-study/view/8

A. Greening National Accounts, World Bank (2010) http://www.wavespartnership.org/waves/sites/waves/files/documents/Greening-the-national-accounts-Challenges-and-initial-practical-steps.pdf https://apps.lse.ac.uk/impact/download/file/1580
B. Valuation and Greening the National Accounts, UN Department of Economic and Social Affairs, http://unstats.un.org/unsd/envaccounting/ceea/meetings/unceea-5-8.pdf https://apps.lse.ac.uk/impact/download/file/1581
C. Testimonial - Deputy Director, Sustainable Land and Rural Evidence and Analysis, Defra. This source is confidential.
D. WAVES PTEC: http://www.wavespartnership.org/waves/waves-policy-and-technical-experts-committee-ptec
E. Testimonial from Programme Officer, Convention on Biological Diversity, UNEP. This source is confidential.
F. Testimonial from Director, National Biodiversity Centre, National Parks Board, Singapore. This source is confidential.
G. Convention on Biological Diversity UNEP/CBD/EW-DCBI/3/2 12 December 2011, http://www.cbd.int/doc/?meeting=ewdcbi-03 https://apps.lse.ac.uk/impact/download/file/1584
H. Convention on Biological Diversity UNEP/CBD/COP/11/INF/45 24 September 2012, http://www.cbd.int/doc/meetings/cop/cop-11/information/cop-11-inf-45-en.pdf https://apps.lse.ac.uk/impact/download/file/1586
I. Government Economic Service Review of the Economics of Sustainable Development, http://archive.defra.gov.uk/evidence/economics/susdev/documents/esd-review-report.pdf https://apps.lse.ac.uk/impact/download/file/1587
J. Natural Environment White Paper, DEFRA, 2011, http://www.official-documents.gov.uk/document/cm80/8082/8082.asp
K. Ofgem Impact Assessment Guidance: https://www.ofgem.gov.uk/publications-and-updates/impact-assessment-guidance
L. Natural Capital Committee: http://www.defra.gov.uk/naturalcapitalcommittee/about/members/
M. http://www.ons.gov.uk/ons/guide-method/user-guidance/well-being/publications/previous-publications/index.html