

Institution: University of Cambridge		
Unit of Assessment: 16 – Economics & Econometrics		
Title of case study: Developing inclusive measures of the wealth of nations		
Period when the underpinning research was undertaken: 2002 to 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Partha Dasgupta	Frank Ramsey Professor of Economics; and Fellow of St John's College. Frank Ramsey Professor Emeritus of Economics; Fellow of St John's College. Chair of Management Committee, Centre of the Study of Existential Risk, University of Cambridge.	1985 to retirement in 2010 2010 to date 2014 to date
Diane Coyle	Bennett Professor of Public Policy, Bennett Institute for Public Policy (BIPP)	March 2018 to date
Matthew Agarwala	Research Associate for Wealth Economy project, BIPP	January 2019 to date
Period when the claimed impact occurred: 2014 to 2020		
Is this case study continued from a case study submitted in 2014? N		
1. Summary of the impact (indicative maximum 100 words)		
<p>Professors Dasgupta and Coyle, Dr Agarwala and the Wealth Economy team at Cambridge lead a global movement looking beyond gross domestic product (GDP) to determine how an economy can prosper sustainably, without sacrificing the natural environment or the future health and wellbeing of its people. Their Inclusive Wealth Framework, developed by Dasgupta in the early 2000's, provides the theoretical foundation for the practical calculation of sustainable development indicators seen in the United Nations' (UN's) Inclusive Wealth reports (2012, 2014, 2018). It underpins India's Green National Accounts (2018 onwards) that seek to reshape government decision-making for a 'better environment, better tomorrow'. Their research has enabled the UN statistics division to account for changes in ecosystems such as air purification, with a direct effect on human health. Their social capital metric supports the Industrial Strategy Council (2019 onwards) in evaluating how policy and economic change affect public trust.</p>		
2. Underpinning research (indicative maximum 500 words)		
<p>GDP growth has been the overarching goal of economic policy for over 70 years. Whilst material gains have been substantial, they have been accompanied by unprecedented environmental and social change, the consequences of which threaten to wipe out a century of gains. It is a fact widely acknowledged that GDP is a useful, but insufficient measure of economic prosperity. Research by Professors Dasgupta and Coyle, Dr Agarwala and the Wealth Economy team at Cambridge provides a pathway for local and national governments, and international institutions, to move beyond GDP and adopt new frameworks that emphasise a society's wealth and wellbeing (rather than its income) and to develop new measures that account for "missing" capital stocks, in particular natural and social capital.</p> <p>Professor Dasgupta's welfare economics research on Inclusive (also called Comprehensive) Wealth from the early 2000's [R1, R2] provides the theoretical foundation for placing human wellbeing, and natural, social, and human capital at the centre of economic statistics. His research at Cambridge shows why the most relevant welfare metric should be wealth and not income, and why the wealth measure must be inclusive and capture not only reproducible and</p>		

human capital but also natural capital, health improvements and technological change. Inclusive wealth can be measured as a linear index of the economy's capital stocks. A key theoretical result [R2] is that changes in Inclusive Wealth have direct consequences for welfare and sustainability. The theory provides a practical wealth management rule for delivering sustainability: Inclusive Wealth must be non-declining for intertemporal social welfare to be preserved over time. This Inclusive Wealth Framework provides the conceptual cornerstone for the development of new measurement frameworks that can guide policy, as demonstrated in Dasgupta's 2012 paper [R3]. The framework not only demonstrates what should be measured from a welfare theoretical point of view, but it offers general guidance on how the theory can be translated into practical metrics for guiding policy and measuring sustainability.

Professor Coyle's research since 2018 at Cambridge [R4; R5] translates the theory [R2; R3] into directly applicable policy guidance. Under her leadership, the Wealth Economy team at Cambridge has shown the impact of natural capital mismanagement, and how these impacts can be valued and reflected in new official statistical standards, using research commissioned by the UK Government and the United Nations (UN). [R6] places Dr Agarwala's 2019 framework within the nexus of food-water-governance, showing how the wealth approach can generate real-world agricultural management improvements. [R7; R8] form part of the Cambridge Wealth Economy team's contributions to the development of the UN System of Environmental Economic Accounts (SEEA). Dr Agarwala demonstrates [R8] how the SEEA can be used by Finance Ministries and Central Banks for direct integration with the standard macroeconomic models in use by national governments around the world and [R7] shows how air filtration ecosystem services can be integrated into the SEEA. Professor Coyle outlines [R4; R5] how GDP-oriented measures increase inequality, and how changing HM Treasury rules on Cost-Benefit valuation can lead to greater investment in those who are 'left-behind' to improve human wellbeing and reduce inequality. This research shows how tangible measures of trust and social capital can be used to evaluate policy and help explain the 'productivity puzzle' facing many developed economies.

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

- R1. Dasgupta, P. (2001). *Human Well-being and the Natural Environment*. Oxford University Press. DOI: [10.1093/0199247889.001.0001](https://doi.org/10.1093/0199247889.001.0001)
- R2. Dasgupta, P. and Mäler, K.G. (2000). Net national product, wealth, and social well-being. *Environment and Development Economics* 5(1), pp.69-93. DOI: [10.1017/S1355770X00000061](https://doi.org/10.1017/S1355770X00000061)
- R3. Arrow, K.J., Dasgupta, P., Goulder, L.H., Mumford, K.J. and Oleson, K. (2012). Sustainability and the measurement of wealth. *Environment and Development Economics* 17(3), pp.317-353. DOI: [10.1017/S1355770X12000137](https://doi.org/10.1017/S1355770X12000137)
- R4. Coyle, D., and Sensier, M. (2019). The imperial treasury: appraisal methodology and regional economic performance in the UK. *Regional Studies* 54(3), pp 283-295. DOI: [10.1080/00343404.2019.1606419](https://doi.org/10.1080/00343404.2019.1606419)
- R5. Mealy, P., and Coyle, D. (2019). To them that hath: economic complexity and local industrial strategy in the UK. Working Paper. DOI: <http://dx.doi.org/10.2139/ssrn.3491153>
- R6. Agarwala, M., and Brock, M. (2019). Natural Capital Accounting for Water Resources. In: Allan, T., Bromwich, B., Keulertz, M. and Colman A. (Eds.) *The Oxford Handbook of Food, Water and Society* (Oxford: Oxford University Press). DOI: [10.1093/oxfordhb/9780190669799.013.1](https://doi.org/10.1093/oxfordhb/9780190669799.013.1)
- R7. Harris R., Reis S., Jones L., Agarwala M., Atkinson G., and Nowak D. (2019). Discussion paper 4: Research paper on air filtration ecosystem services. Paper submitted to the Expert Meeting on Advancing the Measurement of Ecosystem Services for Ecosystem Accounting, New York, 22-24 January 2019 and subsequently revised. Version of 15 March 2019. Available at: <https://seea.un.org/events/expert-meeting-advancing-measurement-ecosystem-services-ecosystem-accounting>
- R8. Agarwala, M., and Zenghelis, D. (2020). Natural Capital Accounting for Sustainable Macroeconomic Strategies. (New York, NY: United Nations Statistics Division). Available at:

<https://seea.un.org/content/natural-capital-accounting-sustainable-macroeconomic-strategies>

Research quality evidenced by rigorous peer-review (**R1, R2, R3, R4 and R6**). **R2 and R4** are cited in Scopus 262 and 263 times respectively. Research outputs **R5, R7 and R8** have been supported by competitively won grants:

- LetterOne. *The Wealth Economy*. January 2019 to December 2019, GBP298,000; and January 2020 to December 2021, GBP550,000. Principal Investigator: Diane Coyle.
- ESRC/AHRC. *The Many Dimensions of Well-Being*. 15/11/2019 to 14/11/2021, GBP244,062.27. Principal Investigator: Diane Coyle.

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

Professors Dasgupta and Coyle, Dr Agarwala and the Wealth Economy team at Cambridge lead a global revolution in thinking about Inclusive Wealth which has a profound effect on policy making across the world. The impact of the research is evidenced by the widespread adoption by policymakers of the frameworks they developed to conceptualize and to measure Inclusive Wealth. By the end of the REF period, at least 69 countries had implemented the United Nations System of Environmental Economic Accounting (SEEA), and a further 22 were planning to do so **[S1]**. Adoption of Inclusive Wealth measures help governments to avoid short-term policy biases and to promote sustainable development.

*‘Professor Dasgupta’s research provided the economic theory underlying the landmark UN Inclusive Wealth Reports [2012, 2014 and 2018] for which he served as Chief Scientific Advisor.’ **[S2]**. His Inclusive Wealth Framework **[R2, R3]** provides the theoretical foundation for the practical calculation of sustainable development indicators and is replicated in the foreword to the ‘Inclusive Wealth Report’ 2018 **[S3]**, pp V-X (Roman)]. These reports estimate Inclusive Wealth, including human and natural capital, across the world. They demonstrate that it is possible to evaluate a country’s progress towards achieving the UN’s Sustainable Development Goals. The Chief Environmental Economist at the Ecosystems Division of the UN Environment Programme states that “We are now better able to measure the stock of each of these capitals, are developing official statistical standards for countries to report changes in wealth, and will continue to use the wealth framework in pursuit of our mission and in delivering the 2030 Agenda” **[S2]** and the Chief of the Environmental-Economic Accounts Division says that “the development of natural capital accounts is closely linked to the theory of Inclusive Wealth developed by Professor Dasgupta.” **[S4]**.*

Dr Agarwala has worked with the UN Statistics Division (UNSD) since 2019 to develop a process to value air filtration ecosystem services within the United Nations System of Environmental Economic Accounting – Experimental Ecosystem Accounts (SEEA-EEA), paving the way for the framework to be adopted as a statistical standard in 2021 **[R7]**. Air purification improves human health, which boosts labour productivity, improves quality of life, and reduces healthcare costs. The Chief of Environmental Economic Accounts at the UN states that this “work is directly linked to the pressure of economic activities on the environment in terms of air emissions captured in the air emission accounts.” **[S4]**. Dr Agarwala and the Wealth Economy team **[R8]** have “provided convincing arguments describing why the SEEA Central Framework and SEEA Ecosystem Accounts are important to macroeconomic decision-makers, particularly in finance ministries, central banks, and investors...This ... demonstrates that the SEEA system of accounts is needed in economic, as well as environmental policy making.” **[S4]**.

Professor Dasgupta chaired the high-level [Expert Group convened by the Ministry of Statistics and Programme Implementation \(MOSPI\)](#), Government of India, to design a framework for green national accounts in India. The Expert Group published its report in 2013 which included a roadmap for implementing the Green Accounting Framework and recommended that economic evaluation be based on Dasgupta’s *Inclusive Wealth Framework* **[R2, R3]**. The 2018 publication from MOSPI, ‘Envistats-India’ is explicit about the intention to “provide the technical ‘push’ to

public policy imperatives in India, so that environmental information is mainstreamed to reshape government decision-making for a “better environment, better tomorrow” [S5 (2018) pX (Roman), paragraph 25]. All recommendations made by Dasgupta’s Expert Group were accepted by the Government of India and can be seen in the 2019 Envistats-India report [S5 (2019) p3, paragraph 5].

In 2018, Professor Coyle was appointed to the UK’s Industrial Strategy Council, an independent body set up to assess the UK Government’s Industrial Strategy. In October 2019, the Wealth Economy team’s measurement of social capital and trust was selected as one of the six ‘Headline Outcomes’ by the Council [S6]. This metric facilitates improvement in policy design by supporting the Council in evaluating how policy and economic change affect trust. The Head of Research at the Industrial Strategy Council is explicit about the role of the Cambridge Wealth Economy Team: *“The metrics identified by Dr Agarwala, with their robust theoretical backing, are now being used as part of the Council’s success metrics...and will inform the Council’s evaluation.”* [S7].

Professor Coyle *“trailblazed”* [S8] a new local industrial strategy when she chaired the Greater Manchester Independent Prosperity Review (IPR) from 2018 to 2019. Building on [R5; R6], this culminated in March 2019 with the ‘Reviewers’ Report’ [S9]. The IPR analysis was accepted, in its entirety, by HM Treasury in June 2019, and provided the intellectual case for subsequent governance reforms. The Chief Economic Advisor to the Greater Manchester Combined Authority views *“Prof. Coyle’s contribution to the IPR to be an exemplary demonstration of the way in which specialised academic excellence and the credibility it can bring can be mobilised effectively to influence public policy and practice.”* [S8]. Professor Coyle also served as a Commissioner on the Cambridge and Peterborough Independent Economic Review until this concluded in September 2018. One of the founders of ‘Cambridge Ahead’ attests that Professor Coyle’s impact on the review’s thinking on measurement of natural capital was of the *“highest importance.”* [S10].

Professors Dasgupta and Coyle, Dr Agarwala and the Wealth Economy team’s research on Inclusive Wealth has profound ongoing effects on policy making in the UK. In March 2019, HM Treasury announced that Professor Dasgupta would lead a major assessment of the economic value of biodiversity [S11]. The (interim) Dasgupta Review was published in April 2020 and is due to be presented at the delayed meeting of the [UN Conference of the Parties to the Convention on Biological Diversity](#) in May 2021. The Wealth Economy team at Cambridge is working with the Office for National Statistics on incorporating ‘missing capitals’ such as social capital into official statistics [S12]. Lastly, Professor Coyle contributed [R4] to a review of the HM Treasury Green Book [published in November 2020](#). *“Combined, the works of Professor Dasgupta, Professor Coyle, and Dr. Agarwala provide the economic rationale for moving Beyond GDP. Their work has highlighted the need for balanced investment in all components of wealth – natural, human, physical, and social capital – and crucially, the interdependencies between them.”* [S2].

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

- S1. UN SEEA Global Assessment of Environmental-Economic Accounting and Supporting Statistics 2017 found that 69 countries had adopted environmental accounting frameworks and a further 22 were planning to do so. The planned 2020 assessment has been delayed. Available at: <https://seea.un.org/content/global-assessment-environmental-economic-accounting>
- S2. Letter of support from Chief Environmental Economist at the Ecosystems Division, United Nations Environment Programme. Received on 9 November 2020.
- S3. UN Environment Programme 2018 Inclusive Wealth Report. Available at: <https://www.unenvironment.org/resources/report/inclusive-wealth-report-2018>
- S4. Letter of support from the Chief of section, Environmental Accounts, United Nations. Received on 10 December 2020.

- S5. EnviStats India-2018 (Supplement on Environmental Accounts), Ministry of Statistics and Programme Implementation (MOSPI), Government of India. Available at: <http://www.mospi.nic.in/publication/envistats-india-2018-supplement-environmental-accounts-0>. EnviStats India 2019 (Vol.II-Environment Accounts), Ministry of Statistics and Programme Implementation (MOSPI), Government of India. Available at: <http://www.mospi.nic.in/publication/envistats-india-2019-volii-environment-accounts>
- S6. 'Social capital' metric as part of the Industrial Strategy Council's 'Headline Outcomes'. Available at: <https://industrialstrategyCouncil.org/15-social-capital>
- S7. Letter of support from the Head of Research at the Industrial Strategy Council. Received on 30 October 2019.
- S8. Letter of support from Chief Economic Advisor to the Greater Manchester Combined Authority (GMCA). Received on 24 February 2020.
- S9. Greater Manchester Independent Prosperity review. Available at: <https://www.greatermanchester-ca.gov.uk/what-we-do/economy/greater-manchester-independent-prosperity-review/>. Pages 24 – 30 of the [Local Industrial Strategy](#) are explicit about the influence of the Prosperity Review.
- S10. Letter of support from a founder of 'Cambridge Ahead', who was involved in writing the terms of reference for the Cambridge and Peterborough Independent Economic Review (CPIER). Received on 22 January 2020.
- S11. A review on the economics of biodiversity was announced by the Chancellor of the Exchequer in March 2019, and is led by Professor Sir Partha Dasgupta. Documents from the review are available at: <https://www.gov.uk/government/collections/the-economics-of-biodiversity-the-dasgupta-review>
- S12. Letter of support from Deputy Chief Economist at the Office of National Statistics. Received on 3 April 2020.