Unit 3.3 Capacity to Measure Progress: What do we know from science and practice about what is needed to measure progress toward sustainability?

How sustainable development is measured inevitably guides how societies pursue their sustainability goals, yet building coherent measurement systems has proven to be one of the field's most persistent challenges. While the overarching goals of sustainable development have been clearly articulated since the 1980s, conceptually coherent measurement systems for tracking progress toward those goals have lagged significantly behind. This Unit explores what sustainability science has learned about measuring sustainable development—both the conceptual foundations for measurement and the practical challenges of building measurement capacity at scale. Such capacity is essential not only for tracking whether we're making progress, but also for use in evaluating whether proposed interventions are likely to foster sustainable development, signaling when improvements in one context come at the expense of others, and providing a basis for negotiation when sustainability challenges cross boundaries of space and time.

Encouragingly, the past two decades have seen substantial advancements in building the capacity to measure progress toward sustainability. Scholars have refined and deepened our understanding of meaningful measurement systems. And national governments, international organizations, civil society, and the private sector are developing practical approaches—from inclusive wealth accounting to multi-dimensional dashboards—that move beyond theory to inform real-world decisions. While building a mature capacity to measure sustainability remains a work in progress, the field is advancing rapidly.

Building on the theoretical foundations of inclusive wealth introduced in Unit 1.5, we now turn from retrospective to prospective analysis. In Unit 1.5, we addressed retrospective sustainability assessments, evaluating whether recent and current development trends are sustainable by asking questions like "Are the prospects people have today for improving their lives and the lives of their descendants better now than they were a generation ago?". In this unit, we shift to prospective analysis—the capacity to measure and evaluate whether particular interventions would be likely to promote improvements in the pursuit of sustainability. We address questions such as "How would alternative land-use decisions affect the provision of ecosystem services and human well-being?". We will also look at what sustainability leaders are doing around the world to build a more robust capacity to measure progress toward sustainability in practice.

Preparation for class: To prepare for this Unit, please:

a) **Read**: Harley, A. G., & Clark, W. C. (2025). *Building Capacity to Measure Sustainability: Lessons from scholarship and practice* (Nos. 25–01; Sustainability Science Program Working Paper, p. 18). Harvard Kennedy School of Government. https://www.hks.harvard.edu/sites/default/files/centers/mrcbg/programs/sustsci/files/Measurement%20Capacity_SSP%20Working%20Paper.pdf (Available in Course Library)

This working paper synthesizes lessons from both scholarship and practice about what's needed to build and maintain a strategic capacity to measure sustainability, including insights from cutting-edge efforts in countries (New Zealand) and organizations (the Natural Capital Project).

b) **Read**: OECD. (2020). *How's Life? 2020: Measuring Well-being*. OECD. https://doi.org/10.1787/9870c393-en. Read Chapter 2: "Conceptual Framework for Measuring Well-being and Progress" (pp. 31-52).

Building on the OECD Better Life Index you explored in Unit 1.2, this chapter presents the OECD's comprehensive framework now being used by multiple countries. It distinguishes between measuring current well-being (the constituents) and the resources needed to sustain it over time (the determinants). Pay special attention to how the authors handle the balance between current and future well-being, which directly relates to our shift from retrospective to prospective analysis.

c) **Explore**: World Bank. (2024). *The Changing Wealth of Nations 2024: Revisiting the Measurement of comprehensive wealth* (No. 193950). World Bank Group. http://documents.worldbank.org/curated/en/099100824155021548. Focus on the Executive Summary (available by scrolling down on this site) and explore this interactive data platform: https://datanalytics.worldbank.org/cwon/.

This report represents one of the most comprehensive efforts to date to measure inclusive wealth across countries and is the most recent comprehensive wealth accounting report in this series (the data platform is updated more frequently with new data points). Pay particular attention to how they value different types of capital assets.

d) **Read**: Goldstein, J. H., Caldarone, G., Duarte, T. K., Ennaanay, D., Hannahs, N., Mendoza, G., Polasky, S., Wolny, S., & Daily, G. C. (2012). Integrating ecosystem-service tradeoffs into land-use decisions. *Proceedings of the National Academy of Sciences of the United States of America*, *109*(19), 7565–7570. https://doi.org/10.1073/pnas.1201040109

This paper demonstrates how natural capital measurement can inform real-world decision-making without necessarily monetizing all assets, instead providing multiple measures and tradeoffs that citizens can use in deliberating over their choices.

e) **Review**: Return to the London teaching case from Unit 1.4, i.e. Matson, P., Clark, W. C., & Andersson, K. (2016). *Pursuing Sustainability: A Guide to the Science and Practice*. Princeton University Press. “London: The struggle for sustainable development in an urban environment” (pp. 143-165).

Study Questions to help you get the most out of the readings:

I. Design a measurement system for use in evaluating whether development in Victorian London (circa 1850-1900) was sustainable. What are the most important specific metrics that you would ideally include in such a system. What are the principal challenges in going from that ideal list to a feasible one?

II. The OECD Better Life Index you explored in Unit 1.2 measured current well-being across 11 dimensions. This Unit’s OECD reading shows how this framework has been expanded to also track the resources needed to sustain future well-being. How does this two-pronged approach address the intergenerational equity concerns central to sustainable development? What challenges remain in moving from measuring current stocks to evaluating future interventions?

III. Both the Harley & Clark working paper (reading ‘a’) and the OECD framework (reading ‘b’) distinguish between measuring well-being outcomes directly (constituents) versus measuring the resource stocks that produce well-being (determinants). Choose a specific sustainability intervention or case you are interested in (e.g., urban green infrastructure, renewable energy transition, wetland restoration etc.) and explain what you would measure using each approach. What insights would each type of measurement provide for evaluating the intervention's likely success?

IV. The Goldstein et al. paper (reading ‘d’) consciously avoids monetizing all ecosystem services. What are the advantages and disadvantages of this approach compared to efforts to create a single "inclusive wealth" number? How might this choice affect the ability to evaluate prospective interventions?

Digging deeper (optional materials for further exploring frontiers in the pursuit of sustainability):

f) **Read**: Dasgupta, P. (2014). Measuring the wealth of nations. *Annual Review of Resource Economics*, *6*(1), 17–31. https://doi.org/10.1146/annurev-resource-100913-012358

This paper provides the theoretical foundations for inclusive wealth accounting, explaining why wealth (properly measured) is the appropriate metric for sustainability and how to value resources that aren't traded in markets.

g) **Read:** Stiglitz, J. E., Fitoussi, J.-P., & Durand, M. (2018). *Beyond GDP: Measuring What Counts for Economic and Social Performance*. OECD. https://doi.org/10.1787/9789264307292-en. Read Chapter 1 "The continued importance of the 'Beyond GDP' Agenda" (pp. 17-37).

This chapter traces the evolution of thinking about measuring societal progress beyond GDP, providing essential context for understanding current approaches to sustainability measurement. The authors explain why GDP alone is insufficient and outline the key dimensions that more comprehensive measurement systems should capture.

h) **Read**: Wagner, G., Anthoff, D., Cropper, M., Dietz, S., Gillingham, K. T., Groom, B., Kelleher, J. P., Moore, F. C., & Stock, J. H. (2021). Eight priorities for calculating the social cost of carbon. *Nature*, *590*(7847), Article 7847. https://doi.org/10.1038/d41586-021-00441-0

The debate over the "social cost of carbon" exemplifies the conceptual and ethical challenges of valuing long-term, large-scale sustainability challenges—particularly relevant for prospective analysis of climate interventions.

i) **Explore**: Capitals Approach. (n.d.). *Capitals Coalition*. Retrieved October 12, 2025, from https://capitalscoalition.org/capitals-approach/ . Review "The Capitals Approach" and one case study

This global coalition is working toward their 2035 ambition of ensuring that the majority of businesses, financial institutions and governments will include the value of natural capital, social capital and human capital in their decision-making.

j) **Watch**: Harley, Alicia G. (Director). (2025, February 12). *Capacity building to measure progress toward sustainable development* [Video recording]. M-RCBG_Harvard. https://www.youtube.com/watch?v=1cYCqBiBwgg.

This is part of the C4SD Seminar Series, Sustainability Science Program, Harvard Kennedy School. The seminar explores practical challenges and emerging solutions in building capacity to measure sustainable development, with examples from multiple contexts showing how measurement systems can guide action toward sustainability.