Unit 1.5 Integrated assessment of resource trends: Are we consuming too much?

Previous Units argued that resource stocks -- natural and anthropogenic -- can usefully be thought of as the ultimate determinants of sustainable development. And that progress in the pursuit of sustainability goals – cast in terms of non-declining and inclusive social well-being -- should be measured by tracking changes in the aggregate social value or wealth represented by the bundle of all relevant resource stocks. The question we begin to address in this Unit is how to do the aggregation. We focus here on retrospective sustainability assessments, i.e. evaluating whether recent and current development trends are sustainable. (A typical question we seek to answer is "Are the prospects people have for improving their lives and the lives of their descendants better now than they were a decade ago?") We turn in later units – after exploring the dynamics of nature-society systems -- to the prospective policy analysis of whether particular interventions would be likely to promote improvements in the pursuit of sustainability. (There we will explore how to address questions such as "Is the wetland restoration project being proposed likely to increase well-being?"[*])

A useful focus for retrospective sustainability assessments is the question "Are we consuming too much?" At the most fundamental level "too much" consumption for development to be sustainable would occur if the gross environmental damage done to natural resources in the course of (say) building a hydroelectric project were greater than the value added to society through the resulting increase in its manufactured capital. One such assessment is discussed in the "environmental accounting" section of first reading listed below. A more comprehensive sustainability assessment would examine whether the value to society of all resources consumed (depleted) in the course of development was "too much" in the sense that it was greater than the value of the investments in other resources enabled by those depletions. This is the thrust of cutting-edge work on "inclusive wealth" assessments covered in the readings. Such assessments are not yet comprehensive and face significant empirical and theoretical challenges. But, as we will discuss in Part III of this course, they are already being implemented by the UN, World Bank, national governments and other organizations around the world in their pursuits of sustainability.

Preparation for class:

a) **Read**: Matson, P., Clark, W. C., & Andersson, K. (2016). *Pursuing Sustainability: A Guide to the Science and Practice*. Princeton University Press. Read "Toward the Integration…" (pp. 50-51), and "Accounting and Indicator Systems" (pp. 75-81).

b) **Read**: Dasgupta, P., Managi, S., & Kumar, P. (2021). The inclusive wealth index and sustainable development goals. *Sustainability Science*. https://doi.org/10.1007/s11625-021-00915-0 (4pp)

c) **Review as needed**: Case study for the Alaska Salmon Fishery introduced in Unit 1.1 (Thompson, M. (2021). *The Alaskan Salmon Fishery: Managing Resources in a Globalizing World* (Course Library for Sustainable Development Course). Harvard University.) Available in the Course Library.

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

The readings discuss two of the many approaches to retrospective sustainability assessment: GED/VA (gross environmental damage relative to economic value added) and IW (inclusive wealth). Compare and contrast the two approaches as you think about the following questions:

I. **Inclusiveness**: All assessment approaches, as a practical matter, must leave out many of the resources we would ideally like to see included in our efforts to understand whether development trends are sustainable. Of the natural and anthropogenic resources discussed in previous Units, which are included and excluded by each of the two approaches presented in the readings? How do

[*] The two specific example questions, and much of the deeper argument made here, are from the Dasgupta 2021 publication listed in the "Digging deeper…" readings for this Unit.

their respective decisions regarding what resources to include affect the implications of their findings for assessing the sustainability of recent trends in development?

II. **Granularity**: The two approaches are quite different in the granularity of their assessments, including both the extent to which they lump different kinds of resources into single categories, and the extent to which they actually aggregate trends in natural and anthropogenic resources to produce single metrics of sustainability. What are those differences? What are the advantages and disadvantages of each approach? For what assessment questions is each most useful?

III. **Connections**: Both assessment approaches largely ignore connections among countries, e.g. transboundary pollution or trade in goods and services. We explore those connections in more detail in Part II of the course. It's worth considering here, however, how you would expect inclusion of such connections to change the results of the assessments. And what might be the greatest barriers to incorporating such connections in updated versions of the assessments?

IV. **Equity**: To what extent do the two approaches inform the equity dimension of sustainability goals? How might they be extended to illuminate equity considerations more effectively?

V. **Sustainability assessment of the Alaskan salmon fishery:** Based on the GED/VA and inclusive wealth approaches discussed in the readings:
- Using the GED/VA approach from Matson, what specific environmental damages from fishing activities would need to be weighed against the economic value added by the fishery?
- Which capital assets in the Alaska salmon fishery case would be included in an inclusive wealth assessment (be specific about both natural and anthropogenic resources/capital assets? Which important assets might be difficult to value in monetary terms?
- If these two approaches gave divergent signals about the Alaska fishery - for instance, if GED/VA showed net environmental damages while inclusive wealth showed growing total capital stocks - what would each be telling you about the fishery's sustainability? What might account for such differences? All of these perspectives considered, are we consuming too much from the Alaska fishery for its current development pathway to be sustainable?

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

d) Arrow, K. J., Dasgupta, P., Goulder, L., Daily, G., Ehrlich, P., Heal, G., Levin, S. A., Mäler, K.-G., Schneider, S., Starrett, D., & Walker, B. H. (2004). Are We Consuming Too Much? *Journal of Economic Perspectives*, *18*(3), Article 3..
This is a classic paper that advanced the "consuming too much" framework that evolved into today's inclusive wealth work.

e) Muller, N. Z., Mendelsohn, R., & Nordhaus, W. D. (2011). Environmental accounting for pollution in the United States economy. *American Economic Review*, *101*(5), 1649–1675.
An elegant example of the "gross environmental damages" approach to sustainability accounting, expanding on the summary given in reading 'a'.

f) Dasgupta, P. (2021). *The economics of biodiversity (The Dasgupta Review)*. HM Treasury. https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review. For a full exploration of the inclusive wealth approach to sustainability assessment, explore "Sustainability assessment and policy analysis" (Ch. 13, pp. 323-358) and "Accounting prices and inclusive wealth" (Ch. 13*, pp. 359-364).
This is one of the most up-to-date expositions on how to better measure progress toward sustainability. Despite its title, it is not just about biodiversity but rather the whole suite of natural and anthropogenic resources addressed in this course. Significantly, it was commissioned – and is being used -- by the UK Treasury.