

# **Calibrating the Carrying Capacities of Capitals**

**A Theoretical Primer on the Quantification of Vital Capitals for Use in Assessing the Sustainability Performance of Organizations**

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**“... [capital] is ‘a stock that yields a flow of valuable goods or services into the future.’ What is functionally important is the relation of a stock yielding a flow—whether the stock is manufactured or natural is in this view a distinction between kinds of capital and not a defining characteristic of capital itself.”**

**R. Costanza and H. Daly, 1992**

**Capital is a stock of anything that yields a flow of valuable goods or services into the future!**

# Introduction

- **The growing acceptance of Context-Based Sustainability (CBS), Multicapitalism and Multi-Capital Accounting has led to frequent questions about:**
  - The multiple capitals themselves (what are they?)
  - The role they play in human well-being
  - What it means for capitals to have “carrying capacities”, especially those other than natural capital like human, social, and constructed capital\*
  - How the carrying capacities of capitals are quantified, measured and expressed
- **Since CBS is predicated on the need to compare impacts on the carrying capacities of capitals with norms for what they would have to be in order to be sustainable, having answers to these questions is critical for the ongoing development of the field**
  - This presentation has been prepared accordingly in order to help answer these questions

\*First introduced by M.W. McElroy in 2008 (<https://www.sustainableorganizations.org/McElroy-DISSERTATION.pdf>)

# Capital Stocks and Flows

(which are expressible in terms of their carrying capacities)

The Capitals		NATURAL	HUMAN	SOCIAL & RELATIONSHIP	CONSTRUCTED	ECONOMIC
<b>CAPITAL STOCKS*</b>		<ul style="list-style-type: none"> <li>Inanimate natural resources on Earth</li> <li>Flora &amp; fauna</li> <li>Ecosystems</li> <li>Embedded information</li> </ul>	<ul style="list-style-type: none"> <li>Individual humans &amp; their bodies</li> <li>Personal knowledge</li> <li>Personal skills</li> <li>Personal health</li> <li>Personal ethical entitlements</li> </ul>	<ul style="list-style-type: none"> <li>Networks of people working together to achieve common goals</li> <li>Mutually-held knowledge and skills</li> </ul>	<ul style="list-style-type: none"> <li>Material products of human design</li> <li>Art, music, theater &amp; literature</li> <li>Processed food</li> <li>Infrastructures</li> <li>Embedded knowledge</li> </ul>	<ul style="list-style-type: none"> <li>Financial assets, debt or equity</li> <li>Non-financial resources/capitals that also play a role in economic entities</li> <li>Intellectual property</li> </ul>
<b>CAPITAL FLOWS*</b>	<b>GOODS</b>	<ul style="list-style-type: none"> <li>Raw/inanimate natural resources</li> <li>Habitats</li> <li>Flora and fauna, including food</li> <li>Biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>More humans</li> <li>All other anthro capitals, including intellectual capital</li> <li>“Cultivated natural capital” (per H. Daly)</li> </ul>	<ul style="list-style-type: none"> <li>More social &amp; relationship capital</li> <li>All other anthro capitals, including intellectual capital</li> <li>“Cultivated natural capital” (per H. Daly)</li> </ul>	<ul style="list-style-type: none"> <li>More constructed capital (manufactured products)</li> <li>Embedded intellectual capital</li> </ul>	<ul style="list-style-type: none"> <li>More economic capital</li> <li>Businesses &amp; jobs</li> <li>Investments</li> <li>Products</li> <li>All other anthro capitals, including Intellectual capital</li> </ul>
	<b>SERVICES</b>	<ul style="list-style-type: none"> <li>Ecosystem services:               <ul style="list-style-type: none"> <li>Water purification</li> <li>Soil production</li> <li>Pollination of crops</li> <li>Climate regulation</li> <li>Etc.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Sensory perception</li> <li>Learning/innovation</li> <li>Intelligence</li> <li>Motility, mobility &amp; dexterity</li> <li>Reproduction</li> <li>Immunity and healing</li> </ul>	<ul style="list-style-type: none"> <li>Gov’t services</li> <li>Healthcare</li> <li>Education</li> <li>Justice</li> <li>Security</li> </ul>	<ul style="list-style-type: none"> <li>Manufacturing</li> <li>Shelter/comfort</li> <li>Healthcare</li> <li>Education</li> <li>Nutrition</li> <li>Transportation</li> <li>Entertainment</li> </ul>	<ul style="list-style-type: none"> <li>Employee income</li> <li>Investor returns</li> <li>Professional &amp; other services</li> <li>Technological innovation</li> <li>Public finance (taxes)</li> </ul>
<b>Human Action and Adaptation</b> (capital stocks and flows are used to take effective action)						
<b>Human Well-Being</b> (outcomes vary depending on capital sufficiency)						

CAPITAL RESOURCES WHEN USED

\*Examples only; incomplete

# Capital Calibrations (Units of Measurement)

- **Capital Stocks (expressed in terms of native units of measurement)**
  - Quantities of natural, informational, relational, constructed and economic resources, expressed in terms of volume, size, weight, number, extent, level, etc.
  - Qualities of such resources expressed in terms of fitness or desirability (e.g., true or verified information as opposed to questionable or untested information)
  - The presence or absence of such resources in binary yes/no terms
- **Capital Flows (expressed in terms of “carrying capacities” per se)**
  - Goods: Same as Capital Stocks above, albeit often expressed in terms of rates
  - Services: Service-levels of natural, informational, relational, constructed and economic functions, expressed in terms of (1) transaction volumes, (2) qualities, or (3) binary yes/no terms

# Some Important Implications

- **Because capital stocks are the wellsprings of valuable goods and services (flows), their preservation, production & maintenance is a precondition for the existence of such flows at levels (i.e., carrying capacities) required to ensure human well-being**
  - For *natural* capitals, this means prioritizing the management of impacts on the carrying capacities of flows, so as to (a) always live within them, and (b) never erode the stocks
  - For *anthro* capitals, this means prioritizing the management of impacts on the stocks themselves, so as to always maintain them at levels required to produce sufficient flows
  - Carrying capacity is a term that applies mainly to capital flows, not stocks
- **Sustainability assessments should therefore focus on the extent to which human impacts on vital capitals have the effect of maintaining the carrying capacities of flows at sufficient levels (or not) and/or the adequacy of their underlying stocks**
- **It should also be understood that with few exceptions, dissimilar capital stocks and flows are generally not substitutable for one another (i.e., a deficiency in one type of capital cannot be compensated for by the presence or growth of another) – impact accounting/monetization schemes for integrated reporting often overlook this**

## Some Important Implications (cont.)

- **It is also important to understand that in sustainability accounting, what we are trying to do is assess the sustainability of discrete impacts on vital capitals, not the size or valuation of capital stocks themselves**
  - **Sustainability accounting is capital impact accounting, not capital valuation accounting!**
- **In order to do this, we must first determine what the carrying capacities of capital flows must be in order to meet stakeholder needs and ensure their well-being**
  - **This is the step in which we identify thresholds in the carrying capacities of capitals (flows)**
- **Once such thresholds have been identified, we can then turn to the task of determining fair, just, proportionate, and organization-specific allocations of the responsibility to maintain them, either by rationing flows or regenerating stocks**
  - **Such allocations can then serve as the context-based norms against which actual impacts on vital capitals can be measured and reported at, for example, an organizational level**
  - **The results then determine the sustainability performance of an organization or group!**

# Glossary

- **Anthro Capitals** – Stocks and flows of human-made (i.e., anthropogenic) capitals, especially human, social & relationship, constructed, economic and their embedded intellectual capital; does not include natural capitals, since they are not human-made, but does include “cultivated natural capitals”
- **Capital** – A stock of anything that yields a flow of valuable goods or services into the future
- **Capital Flows of Goods** – Natural, human, relational, constructed, economic and informational resources people rely on for their well-being (often as rates)
- **Capital Flows of Services** – Natural, human, relational, constructed, economic and informational functions humans rely on for their well-being (often as rates)
- **Carrying Capacity** – A measure of the extent to which capital flows can meet the needs of a population, including consideration of the adequacy of their underlying stocks (i.e., directly applies to flows, but only indirectly to stocks)

# Thank you!

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