An Intellectual History of Thresholds and Allocations

Foundations of Context-Based Sustainability and Multicapitalism

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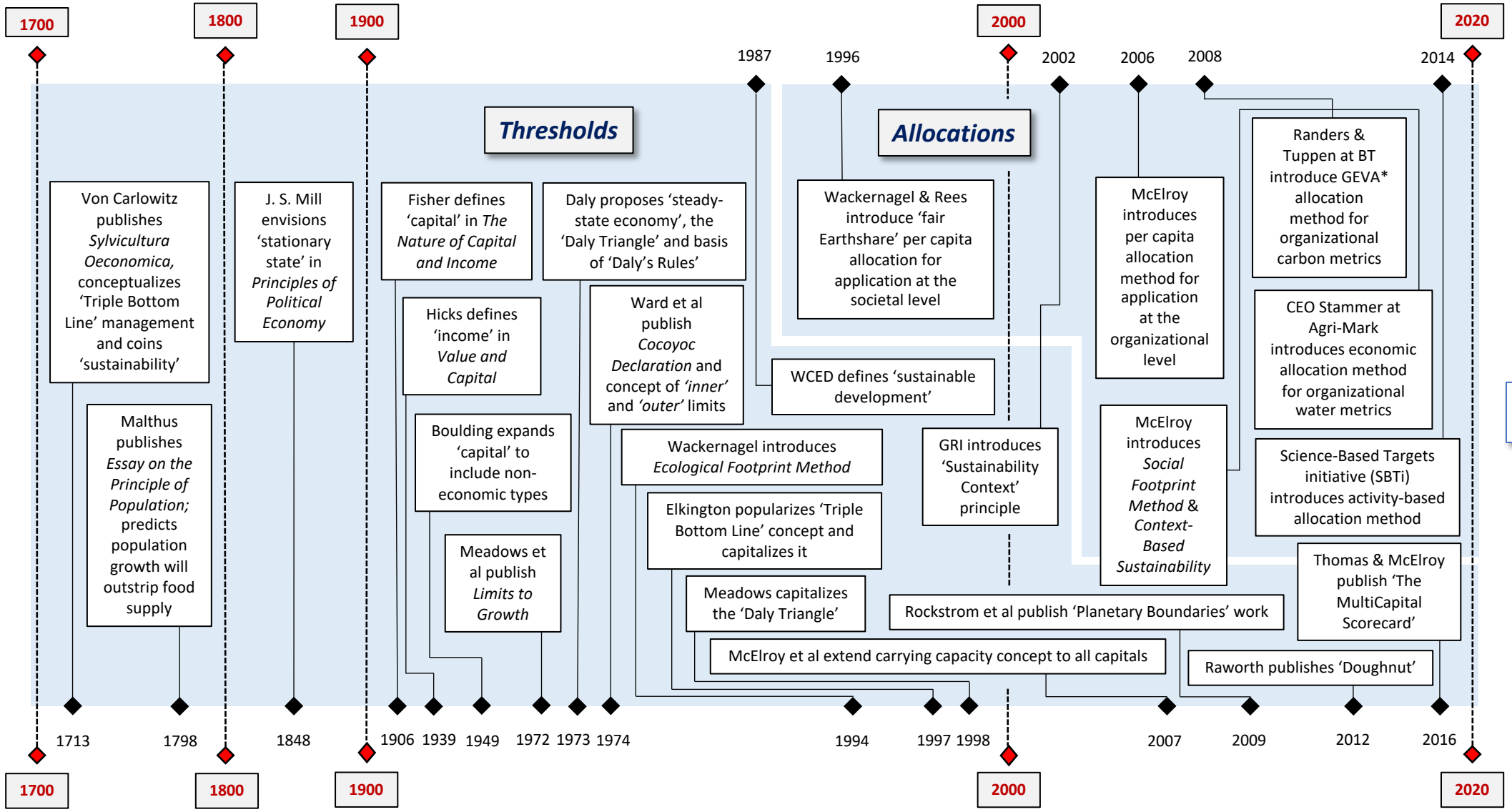
(and their underlying foundations in capital theory)



See annotations on next slide

*GEVA = Greenhouse Gas Emissions per Unit of Economic Value Added

Annotations to the Thresholds and Allocations Timeline

1. **Von Carlowitz (1713)**: Introduced thresholds-based sustainability management and also, arguably, triple bottom line thinking; coined 'sustainability' in his book; all at a meso level of analysis (forestry).
2. **Malthus (1798)**: First to apply thresholds thinking at the macro human scale and to put risks to human survival in light of it on the table.
3. **J. S. Mill (1848)**: First to put forward a 'stationary-state' economic model grounded in thresholds.
4. **Fisher (1906)**: An economist who was first to put forward a theory and definition of 'capital' grounded in thresholds and which has shaped the contours of sustainability thinking ever since (i.e., that capitals are stocks of valuable resources/wealth that produce flows of 'income').
5. **Hicks (1939)**: Another economist who built on Fisher's contributions by further elaborating on the nature of capital flows (income) and the extent to which they can be consumed without putting the underlying stocks at risk.
6. **Boulding (1949)**: Again, an economist, whose writings constitute the earliest evidence of 'capital', the construct, being expanded to include multiple, non-economic forms.
7. **Meadows et al (1972)**: The first, multi-dimensional, global application of thresholds-based thinking (i.e., not limited to food supplies as Malthus was) to the study of human survival on Earth, all with the aid of system dynamics.
8. **Daly (1973)**: Built on Mill's notion of a 'stationary-state' economy by expressing it in terms of impacts on natural resources relative to thresholds; referred to it as a 'steady state' model. Included a model for understanding the relationships between ultimate means, intermediate means, and human well-being ('Daly's Triangle), and also the basis for what later became known as 'Daly's Rules'.
9. **Ward et al (1974)**: Introduced the combination of upper (ecological) and lower (socioeconomic) limits in resources/conditions on Earth – referred to by them as 'outer' and 'inner' limits, respectively.
10. **WCED (1987)**: WCED publishes the Brundtland Commission report, *Our Common Future*, in which sustainable development is defined as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."
11. **Wackernagel (1994)**: Introduced the Ecological Footprint Method, the first measurement and reporting system for assessing the sustainability of human impacts on natural capitals vis a vis their thresholds; used a blended measure of 'bioproductive capacity' to quantify the carrying capacities (thresholds) of natural capital on Earth.
12. **Wackernagel and Rees (1996)**: Introduced the first normative principle (and metric) for determining what humanity's impacts on natural capital *ought* to be (i.e., that it should be calibrated in per capita terms). Referred to it as 'Fair Earthshares'; was applied only to macro, societal levels.
13. **Elkington (1997)**: Proposed the idea that the performance of organizations should be assessed in terms of their 'triple bottom line' performance and, importantly, that such assessments should be thought of in terms of their impacts on multiple vital capitals.

Cont.

Annotations to the Thresholds and Allocations Timeline (cont.)

14. **Meadows (1998)**: Puts forward a capitalized interpretation of 'Daly's Triangle', whereby all 'Ultimate Means' are represented as natural capitals, and all other resources important for human well-being are represented as capitals of other kinds.
15. **GRI (2002)**: Introduced Sustainability Context principle in the 'G2' edition of its *Guidelines*.
16. **McElroy (2006 [see McElroy 2008 146-9; 183-208])**: Introduced the per capita allocation method at the organizational level of analysis, thereby constituting world's first systematic approach for making fair, just and proportionate allocations of sustainability norms and thresholds at the organizational level.
17. **McElroy et al (2007)**: Introduced extended application of the carrying capacity concept to all capitals, not just natural capital, as part of the R&D leading up to McElroy's dissertation in 2008.
18. **McElroy (2008)**: Introduced the Social Footprint Method and Context-Based Sustainability at the organizational (micro) level of analysis; would later go on to apply both at the meso and macro levels.
19. **Randers and Tuppen (2008)**: Developed and applied first GEVA (Greenhouse Gas Emissions per Unit of Economic Value Added) allocation method used in conjunction with a context-based carbon metric (at BT).
20. **Stammer (2008)**: Developed and applied first economic allocation method used in conjunction with a context-based water metric (at Agri-Mark/Cabot).
21. **Rockstrom et al (2009)**: Introduced 'Planetary Boundaries' model that measures and reports the sustainability of humanity's impacts on vital ecological resources in the world; provides a new, component-based alternative to the Ecological Footprint Method.
22. **Raworth (2012)**: Builds on Ward et al's work, in particular, to more fully elaborate the 'inner' and 'outer' limits concept put forward in 1974; provides a reference model in visual form that can inform practice.
23. **SBTi (2014)**: First multi-NGO embrace of thresholds-, allocations-, science- and context-based metrics for application at the organizational (micro) level; also introduced an activity-based allocation method as part of their Sectoral Decarbonization Approach (SDA) target-setting tool; signaled start of growing adoption of context-based measurement, management and reporting worldwide; would later inspire similar efforts, such as the Science-Based Targets Network initiative now underway.
24. **Thomas & McElroy (2016)**: Introduced world's first fully integrated and context-based Triple Bottom Line method (the MultiCapital Scorecard, or MCS), in such a way as to combine the application of thresholds and allocations principles in a single performance accounting tool. The MCS, an open-source method, has since been used at the organizational, municipal and national levels to assess the sustainability performance of human social systems and is arguably the most advanced implementation of Context-Based Sustainability. Note: This book followed an article published in 2015 by the same title, and also the introduction of the authors' underlying concept of 'Multicapitalism' in 2014: http://www.multicapitalism.com/Multicapitalism.pdf

See references on next slide

Key References in the Thresholds and Allocations Literature
(in chronological order by category)

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