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Reversing the over-use of natural capital in socio-technical systems; what might stability look like?

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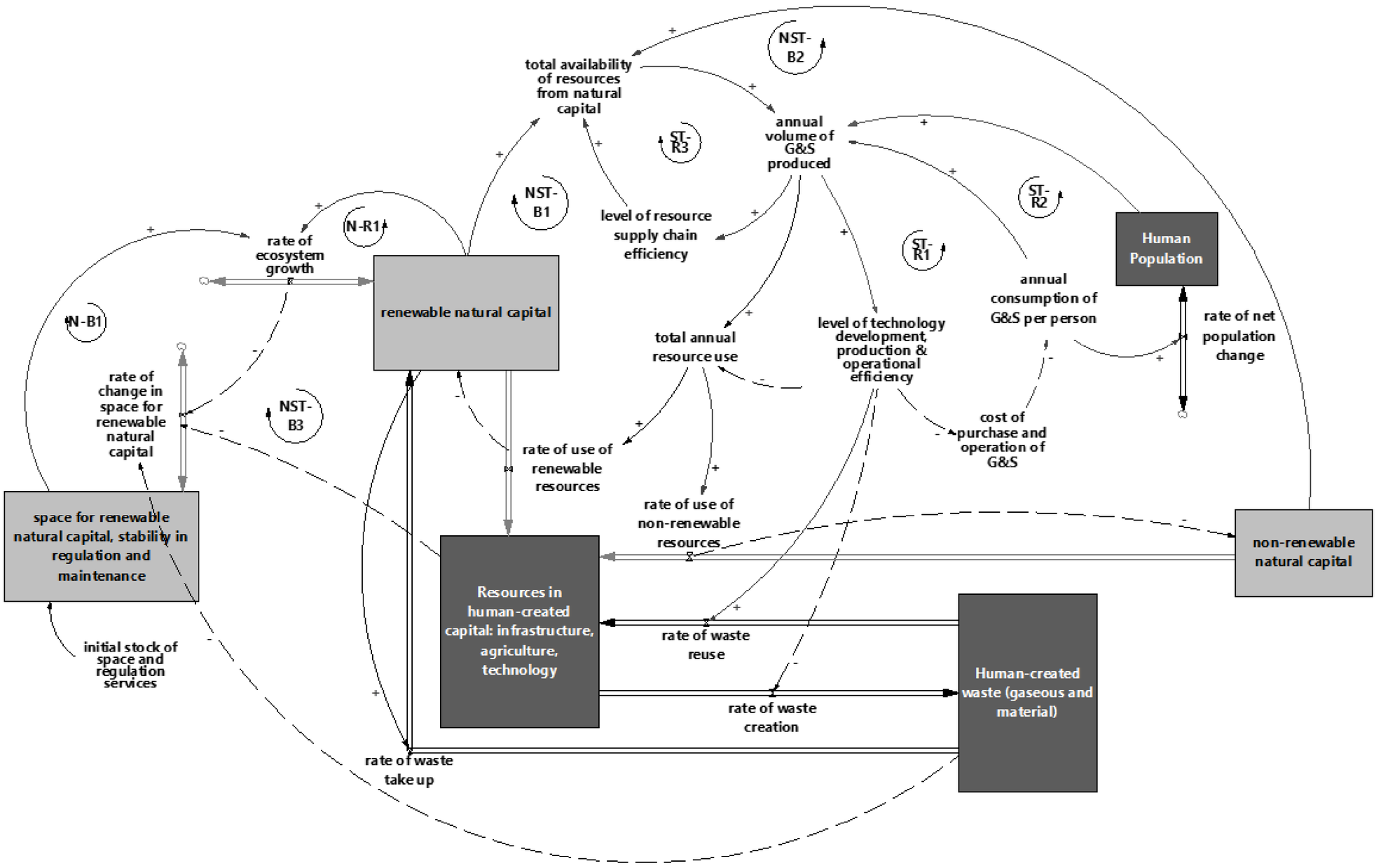
Trends in natural capital and human-created capital during the Great Acceleration

The G.A. has seen increasing stocks of human-created capital and waste, and decreasing stocks of natural capital.

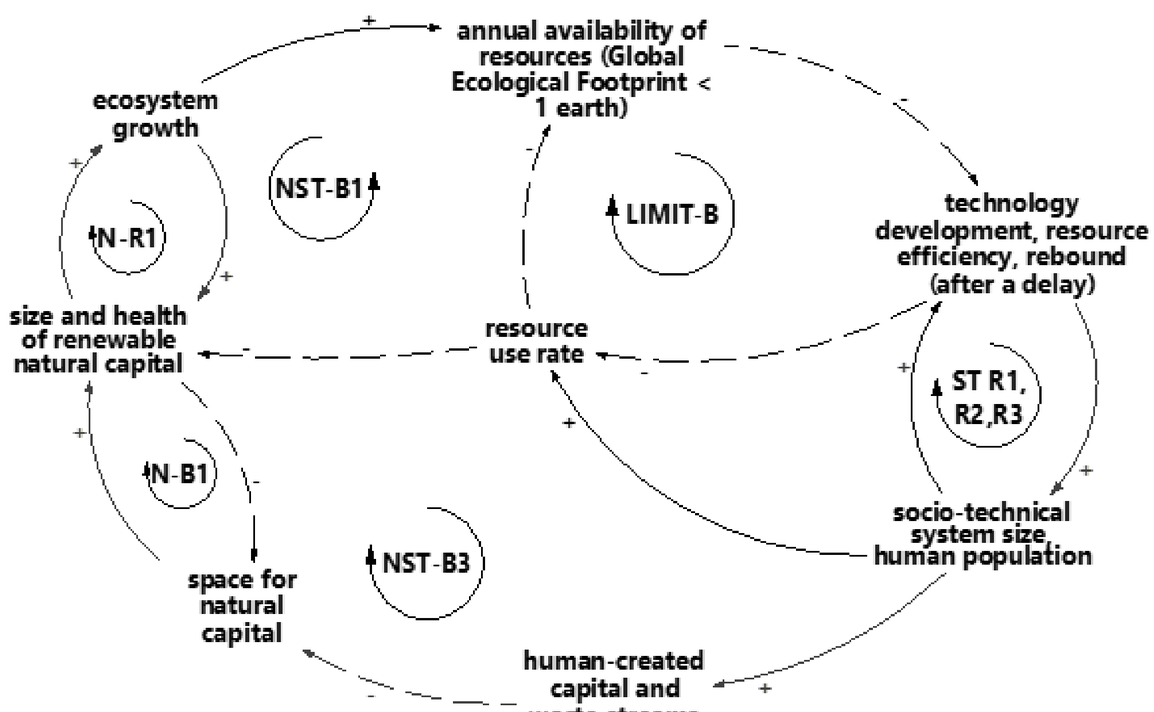
High rates of resource use and waste creation mean humanity has been liquidating some of the pre-industrial stock of natural capital

The change engine is growth in socio-technical systems, fuelled in part by the rebound effect, and population growth.

Early indicators of ecological overshoot exist, but with little associated slowing down in socio–technical growth across the world.



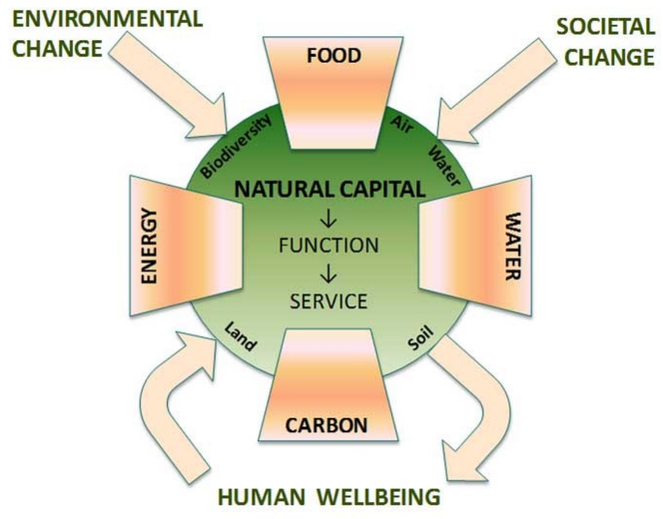
What might a socio-technical system look like that stabilises natural capital?



- A new balancing loop, LIMIT-B would ensure availability of renewable resources is defined by the rate of ecosystem regeneration rather than the total natural capital stock.
- Rebound would disappear while natural capital recovers
- Eventually, as natural capital grows in size, resource availability would increase
- Rebound may reappear after this but only growing consumption so that resource limits are not exceeded.

Challenges in modelling tipping points in the relationship between natural capital and human societies

1. Quantification of stocks and flows of natural capital is complex.
2. Units, scales, knowledge are highly variable across the globe.
3. Important to represent possible tipping points, weakening of ecosystems, and delayed responses in natural systems—some models already do this.
4. *Also* important to represent tipping points and delayed responses in socio-technical systems and their dependence on natural capital.
5. **The challenge:** to model possible ways forward in which the stability of natural capital, under predicted global changes up to 2100, is valued appropriately within economies, industries, and human societies.



http://www.hutton.ac.uk/sites/default/files/images/research/snc/natural-capital-figure.jpg