

Sustainability in the Anthropocene:

Governing the Global Commons within Planetary Boundaries

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Rising human pressures on the planet during the Great Acceleration phase from the 1950s onwards, has pushed the Earth system into a new geological Epoch, the Anthropocene. This is the age of the human enterprise, where our modern economy triggers impacts that exceed, in both pace and scale, the natural variations, stresses and shocks from Earth's orbit around the Sun, volcanic eruptions, and Earthquakes. Today, science is forced to consider the real risk of us, the modern world, destabilising the entire planet, potentially pushing the Earth system away from its equilibrium state, the Holocene, that has been the prerequisite for the development of modern human civilisations since we left the last Ice Age some 12,000 years ago. Nine of 15 known climate tipping elements are showing signs of approaching tipping points, and Earth system analyses show unequivocal scientific evidence that a stable climate on Earth, requires that other Earth system regulating processes and systems are kept within a safe operating space, i.e., scientific targets for a resilient and stable planet (ranging from biosphere, to climate and cryosphere). The Planetary Boundaries framework provides such safe targets. Together, the scientific evidence of the Anthropocene, tipping elements, risks of interacting cascade effects, and their impacts on humans, calls for a new paradigm of planetary stewardship, setting the frontier of sustainable resource science in the Anthropocene, and being framed around our ability to govern the global commons within planetary boundaries, as a pathway towards delivering on the Sustainable Development Goals and world development through this century and beyond.