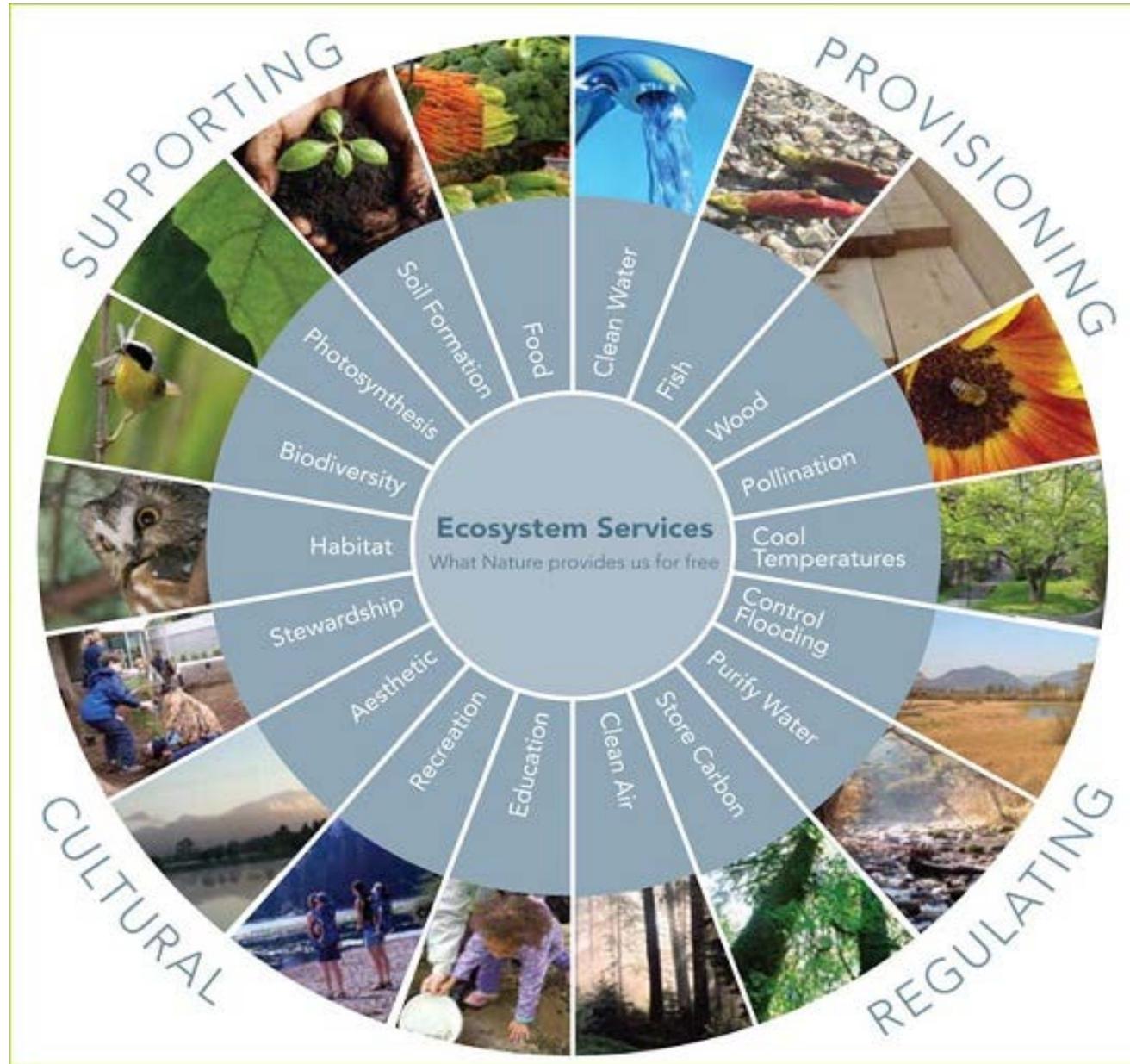


Basic Concept: Ecosystem Services



The 3 Planetary Crises

1. Climate change

- Paris Agreement: “holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C”
- The business-as-usual scenario is catastrophic; and hence need for fast and drastic action
- Climate influences the survival, reproduction, abundance and distribution of pathogens, vectors and hosts. Zoonotic diseases etc. will be more severe in African countries, where disease surveillance and data are particularly scarce.

Climate change affects health in three ways:

- Directly, such as the mortality and morbidity due to extreme heat events, floods, etc.;
- Indirect impacts from environmental and ecosystem changes, e.g. shifts in patterns of disease carrying mosquitoes and ticks, or increases in waterborne diseases; and
- Indirect impacts through societal systems, e.g. undernutrition and mental illness from altered agricultural production and food insecurity, stress, and violent conflicts caused by population displacement; economic losses due to widespread impacts on the workforce; or other environmental stressors, and damage to health care systems by extreme weather events.

NB: Many zoonoses are climate sensitive and a number of them will thrive in a warmer, wetter, more disaster-prone world foreseen in future scenarios. Some pathogens, vectors and host animals probably fare more poorly under changing environmental conditions, disappearing in places and resulting in the loss of their population-moderating effects or the establishment of other species in the new ecological niches created by their departure. There is some speculation that the SARS-CoV-2 may survive better in cooler, drier conditions when outside the body (UNEP and ILRI, 2020)

The 3 Planetary Crises

2. Chemicals and Pollution

- Exponential increase in the number and variety of chemicals being produced globally, with many being novel without adequate understanding of their environmental impacts (e.g. PoPs)
- Dumping (legal and illegal) hazardous wastes is a growing concern in Africa (e-waste, nuclear waste, controlled substances under the chemicals MEAs etc)
- Increasing incidents of air (including by sand and dust storms), land/soil, and water pollution leading to poor health outcomes (human, animal and ecosystem health)
- Water pollution (nutrification, municipal, etc) exacerbates water scarcity in Africa and the attended health risks
- Increased incidents of pharmaceuticals leading to antimicrobial resistance (AMR)
- Addressing air pollution and waste is also linked to climate change mitigation

The 3 Planetary Crises

3. Nature & biodiversity

- **“Living in harmony with nature”** means that biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people
- Assessments show that ecosystem degradation and loss of biodiversity are on the rise now unlike 50 years ago.
- **Ecosystem health and productivity** are essential to securing human and animal health.
- **Infectious diseases outbreaks and environmental changes** (habitat fragmentation, deforestation, urbanization, wild meat consumption) are positively correlated

- **Fragmentation of ecosystems by Rapid urbanization + Infrastructure development:** The greater movement of people, animals, food and trade that is associated with accelerated urbanization often provides favourable grounds for the emergence of infectious diseases, including zoonoses.
- **Deforestation and Forest degradation** encourages contacts at the human livestock-wildlife ecosystem interface;
- **Invasive Alien Species** (plant and animal, aquatic and terrestrial) compromise ability of ecosystems to function optimally including in disease control

