

# An Introduction to Natural Resource Management

## Part 1: Conservation, Preservation and Command and Control

### Environmentalism in the American Progressive Era (early 20<sup>th</sup> century)

- In the American Progressive Era, the debate on how best to manage the environment revolved around two themes: conservation and preservation
- Conservation, as advocated by **Gifford Pinchot**, is the **wise use** of natural resources
  - o Gifford Pinchot argued that natural resources should be used to achieve the greatest good, for the greatest number, for the longest time
  - o In other words, Pinchot argued that natural resource consumption should be governed by *utilitarian* principles
  - o Pinchot's conservation principles argued that state control was necessary
    - According to him, state intervention is needed to maintain this so-called 'wise use' of natural resources
    - Pinchot was especially concerned that industries were advancing too quickly and feared that monopolies would take control over natural resources
    - For Pinchot, the only way to stop this was aggressive state intervention to govern the ways in which natural resources were used
- Preservation, as advocated by **John Muir**, is the **no use or limited use** of natural resources governed by the protection of the wilderness
  - o Muir argued that there were some parts of the environment that we simply cannot develop, as they would be too much of a loss if destroyed
  - o According to Muir, instead of providing for the greatest good, for the greatest number, and for the longest time (utilitarianism), natural resources should be governed to protect the natural environment, rather than merely protected for human consumption
- The political debate between Pinchot's conservation and Muir's preservation saw conservation succeeding over preservation
- As such, the US government began to initiate conservation projects nationally, one of which was the Tennessee Valley Authority (TVA) project in 1933

### The Tennessee Valley Authority (TVA) conservation project (1933)

- The Tennessee Valley Authority (TVA) project was a large-scale scheme initiated by the US government according to the principles of conservation
- The TVA was created to provide general economic development to the region through power generation, flood control, navigation assistance, agriculture development and fertiliser manufacturing
- In other words, authorities aimed to convert and manage the Tennessee Valley watershed into something that would be the greatest good for society, for the greatest number, for the longest time

- This aligns closely with the utilitarian principles that conservation is known for
  - o Dams, whilst controlling flooding, also brought power to rural areas without electricity to drive the modernisation of the American South - this electricity facilitated schools and hospitals to be built in the area
  - o By developing agriculture and fertiliser manufacturing, the TVA was able to generate jobs in the local area
- In essence, conservation in the TVA not only focused on transforming and managing nature: it also attempted to drive change in society – this is aligning with utilitarian conservation principles that attempt to transform the environment into something that is best for human use
- The utilitarian TVA became the model for America’s efforts to help modernise agrarian societies in the developing world, and also the model for conservation worldwide

#### The TVA is an example of conservation by ‘command and control’

- The TVA is an example of ‘command and control’:
  - o ‘Command’ – it had a centralised, bureaucratic decision-making process which focused on regulation, which was enforced by the governing body
  - o ‘Control’ – it required simplifying of natural systems and using this information to regulate usage

#### The TVA model of conservation by command and control starts to go global in the 1950s

- The 1949 United Nations Conference on the Conservation and Utilisation of Resources recommended command and control style conservation management of natural resources
- Indeed, Harry Truman, in a letter to UNESCO, said that conservation was the major basis for peace and a means to avoid catastrophic military conflict
  - o *“The real or exaggerated fear of resource shortages and declining standards of living has in the past involved nations in warfare. Every member of the United Nations is deeply interested in preventing a recurrence of that fear and of those consequences. Conservation can become a major basis for peace.”* (Harry Truman to UNESCO, 1949)

## Part 2: Beyond Conservation – Development in the Anthropocene

### Against conservation by command and control: Aldo Leopold's *A Sand County Almanac* (1949)

- Aldo Leopold in his book *A Sand County Almanac* heavily criticised previous natural resource management methods that revolved around anthropocentric conservation by command and control
- Leopold argued that these natural resource management methods effectively enable humans to become 'conquerors' of the land, effectively allowing societies to dominate nature for their own benefit without regard to other species or the natural environment
- Leopold fundamentally disagrees with this view and argues that we should transition towards becoming 'citizens' with the land (rather than dominating land)
- To do this, Leopold argues that we need to adopt a 'land ethic' where we think about land past it as being an economic commodity
  - o Leopold argues that we abuse land because we regard it as a commodity belonging to us
  - o When we see land as a community to which we belong, we begin to use it with love and respect
- To contrast utilitarianism, Leopold promoted a more ecologically centred ethic: **'A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise'** (pg. 242)

### Development in the Anthropocene: Planetary Boundaries and Planetary Stewardship

- In the Anthropocene, development must take into consideration the condition of our planet
- Two connected, similar means have been proposed, which are operating within planetary boundaries (Rockström et al. 2009) and planetary stewardship (Steffen et al. 2011)

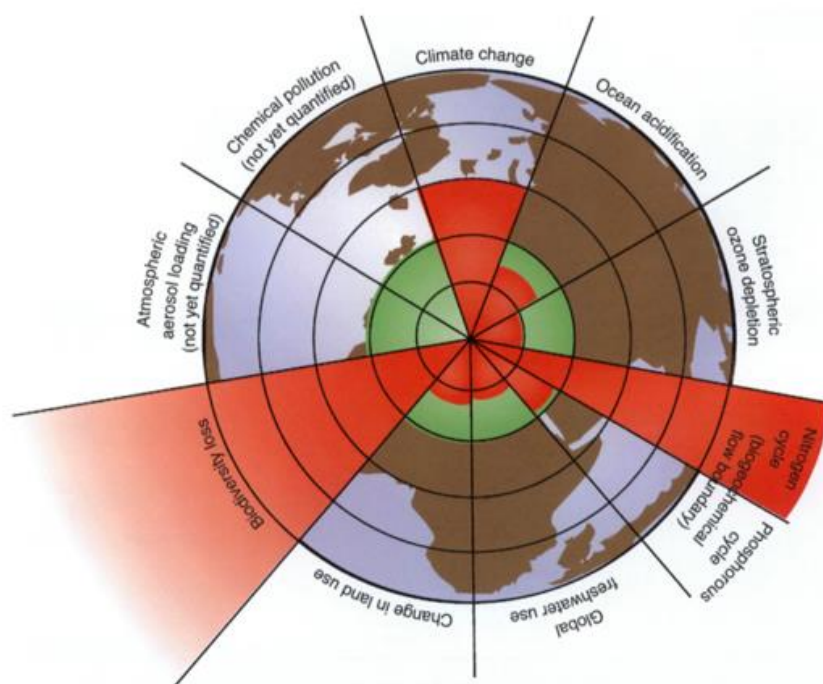


Fig. 9 The inner green shading represents the proposed safe operating space for nine planetary systems. The red wedges represent an estimate of the current position for each variable. The boundaries in three systems (rate of biodiversity loss, climate change and human interference with the nitrogen cycle) have already been exceeded (Rockström et al. 2009a)

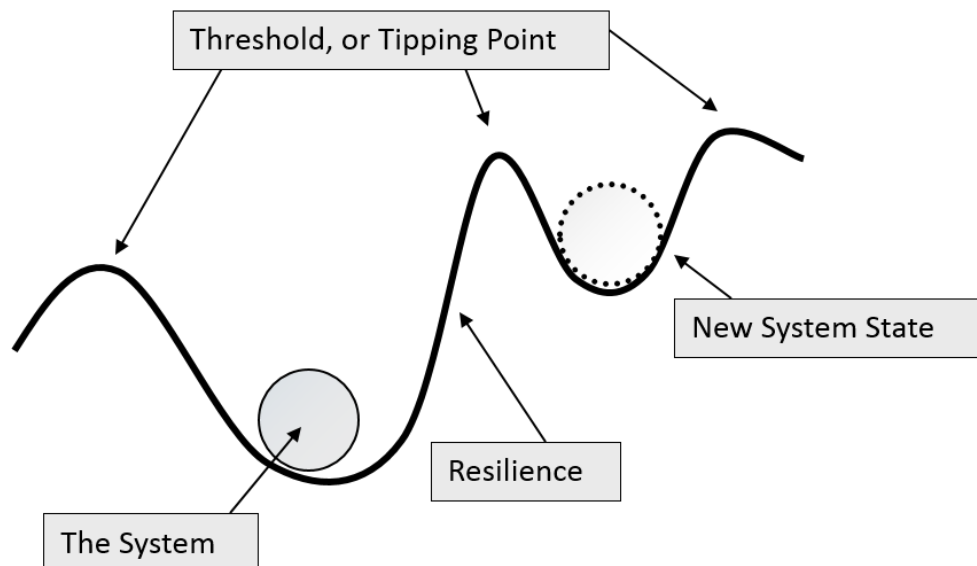
### Planetary Boundaries (Rockstrom et al. 2009)

- Rockstrom and his team argued that we need development to operate within his planetary boundaries (termed the 'safe operating space for humanity')
- Changes in the Anthropocene mean we need to develop ethically with respect to these boundaries
- He argues that identifying and quantifying planetary boundaries should be done to prevent human activities from causing unacceptable environmental damage
- Indeed, he argues that crossing boundaries is dangerous (3 of the 9 boundaries have already been crossed, as shown in the diagram above)
- He argues if one boundary is crossed, all others are under serious risk due to knock on effects

### Planetary Stewardship (Steffen et al. 2011)

- Related to Leopold's land ethic, Steffen argues that we should develop 'Planetary Stewardship' as a new way to think about and treat the planet
- He argues that, due to the pressures of the Anthropocene, planetary stewardship is vital
- If we do not adopt planetary stewardship, we could drive the earth into a state that is so different from the Holocene ('normal') that we cannot return
- Effective planetary stewardship can be built around Rockstrom's planetary boundaries to allow Earth to remain in a stable Holocene state
- Without such stewardship, the Anthropocene threatens to become for humanity a one-way trip to an uncertain future in a new, but very different, state of the Earth System

### Resilience-based approaches



- Resilience can be defined as the “**ability of a system to tolerate disturbances while still maintaining its identity, function and feedbacks**” (Folke 2006)
- Resilience approaches shifts policies from trying to maintain an environment in a constant state to managing the **capacity of social-ecological systems to cope with, adapt to, and shape change**
- It challenged the command and control view that there is a dominant equilibrium: resilience-based approaches advocate to manage around non-linear dynamics, uncertainty, surprise and how periods of relative stability interplay with periods of rapid change

- Old views assumed a stable and infinitely resilient environment where resource flows could be controlled, and nature would self-repair into equilibrium when human stressors were removed
- Instead, resilience approaches incorporated change into management and accounted for the fact that nature is intrinsically dynamic and ever-changing

#### Where did the resilience-based approaches originate from?

- The resilience perspective arose in the 1960s and early 1970s through studies of predator-prey relationships
- C. S. Holling (1961) showed the existence of multiple domains of stability in natural ecological systems, and then introduced resilience as the capacity to persist within such a domain in the face of change

#### Alternative Approaches to Natural Resource Management: Traditional Ecological Knowledge (TEK)

- Traditional Ecological Knowledge (TEK) is assumed to be qualitative and 'traditional', whilst modern science is considered to be quantitative and 'modern' (in other words, a *dualism* has been drawn between the two)
- Indigenous peoples have always had names for their lands, theories about how the world works, and histories of their own. However, they have been portrayed as being without intellectualism and philosophy
- It was this dualism that enabled colonisers to impose their environmental management regimes (e.g. conservation by command and control)
- Since the 1970s, governments in many regions (particularly North America and Australia) have sought to incorporate traditional ecological knowledge into resource management plans
- Types of management that incorporate TEK are termed 'co-management'