

BSSb1194

Complex societies and their collapse

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A solid orange horizontal bar at the bottom of the slide.

Early complex societies

- what is their purpose?
- why were early civilizations where they were and not somewhere else?
- what do they need?
 - acceptable climate
 - water, food
 - natural resources



Agriculture

- ability to feed people is dependent on local crops
- it must be efficient to allow for specialization
- crops are not equal
 - wheat and rice are ideal
- it is difficult to spread crops to different latitude

Livestock

- domestication of animals is also crucial
 - for both meat and physical power

- animals are not equal either
 - some are much harder to domesticate than others
 - diet, growth and breeding, temperament, sociability, etc.

- can also have trouble migrating to different latitudes



Natural resources

- societies need fuel
 - wood, coal, oil, ...
- and structural materials
 - wood, metals, etc.



Causes of collapse

- societies grow more complex to solve problems
- complexity “costs energy”
- increasing complexity has diminishing returns
 - can be recovered by innovation and technology
- complexity tends to lead to specialization
- specialization tends to lower adaptability
- adaptability is needed to respond to shocks

Causes of collapse

- collapse = forced loss of complexity
 - when a society cannot “afford” itself anymore
 - can overshoot carrying capacity or diminish it

- dependent on neighboring societies
 - lack there of, trade, takeover – W vs. E Roman Empire

- most collapses from combination of causes, but not always, single shock can be enough

Resilience

- ability of a (social) system to maintain its function during some crisis or restore it afterwards
- specialization and optimizing for efficiency decrease resilience
 - for example on-time supply chains
 - or lacking redundancies

On shocks

- natural shocks are common triggers
 - famines, earthquakes, disease

- but “unnatural”, i.e. man-made, accidents
 - unintentional consequences of intentional actions
 - most commonly industrial disasters
 - like Chernobyl or Bhopal

Note on “self-propagating systems”

- any system that grows or multiplies with success (ie society/nation/empire ...)
- competition among systems (for resources, etc.)
- winner grows and multiplies, loser withers

- basically a Darwinian perspective:
natural selection among social systems
- prioritizes short-term gains over long-term risks

The Great Filter

- Drake equation

- $N = R * f_p * n_e * f_l * f_i * f_c * L$

- Fermi paradox

- “where are all the ETs?”

- Great Filter?

- something stops intelligent life

Questions

- can we collapse?
- what would it take?
- what would it look like?
- are you prepared?