

Note: - Various books of **Environmental Economics and other subjects** also available **free of cost** on **Libgen**. Students can download.

**M.Com (Applied Economics)  
Semester- IV**

**Paper- Environment and Resource Economics**

**Topic: carrying capacity**

**Introduction**

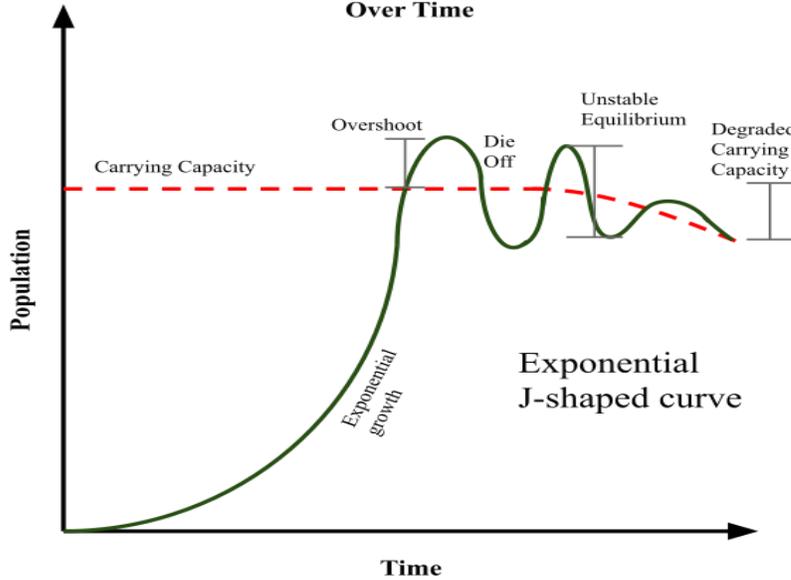
The carrying capacity of a biological species in an environment is the maximum population size of the species that the environment can sustain indefinitely, given the food, habitat, water, and other necessities available in the environment. In population biology, carrying capacity is defined as the environment's maximal load, which is different from the concept of population equilibrium.

Carrying capacity was originally used to determine the number of animals that could graze on a segment of land without destroying it. Later, the idea was expanded to more complex populations, like humans. For the human population, more complex variables such as sanitation and medical care are sometimes considered as part of the necessary establishment. As population density increases, birth rate often increases and death rate typically decreases. The difference between the birth rate and the death rate is the "natural increase". Is the carrying capacity could support a positive natural increase or could require a negative natural increase. Thus, the carrying capacity is the number of individuals an environment can support without significant negative impacts to the given organism and its environment. Below carrying capacity, populations typically increase, while above, they typically decrease.

A factor that keeps population size at equilibrium is known as a regulating factor. Population size decreases above carrying capacity due to a range of factors depending on the species concerned, but can include insufficient space, food supply, or sunlight. The carrying capacity of an environment may vary for different species and may change over time due to a variety of factors including: food availability, water supply, environmental conditions and living space.

The concept of **carrying capacity understands by the following figures:**

**Figure 1: Exponential Growth of Population Size Over Time**

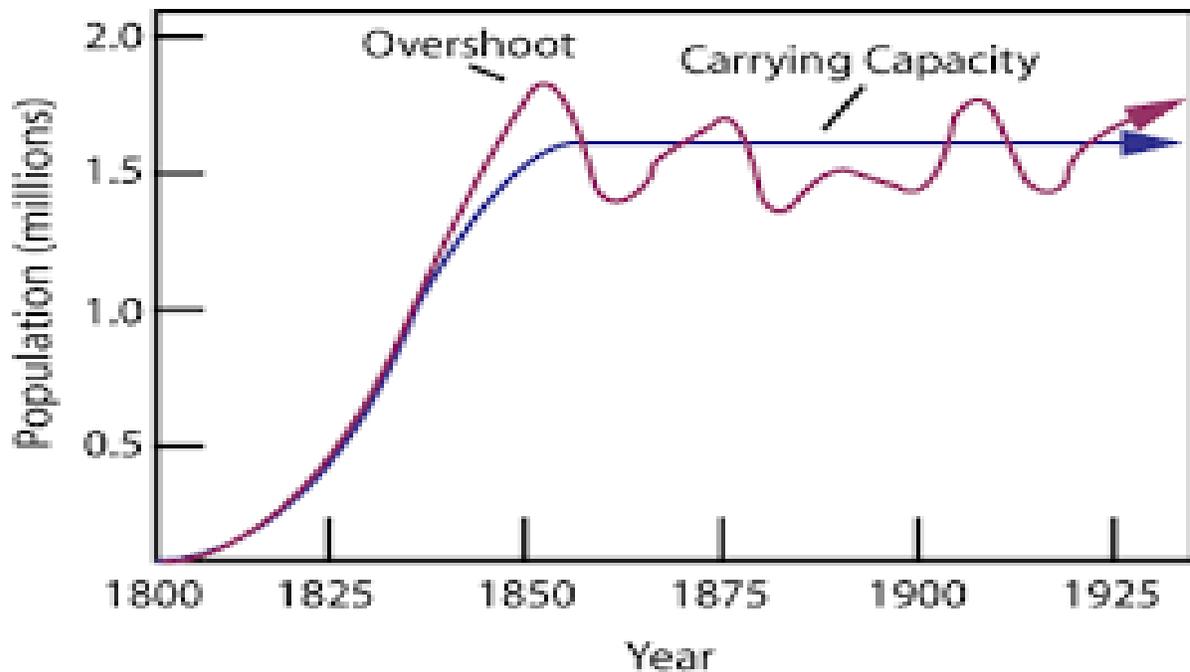


Carrying capacity is the amount of organisms within a region that the environment can support sustainably

Overshoot occurs when the population growth exceeds the carrying capacity, leading to a die off for the individuals in the population

Unstable equilibrium is the fluctuation of the population above and below the carrying capacity, changing based on the relationship between natality and mortality

Degraded carrying capacity may be due to resource destruction during an overshoot, carrying capacity is not static



**Reference:**

[https://en.wikipedia.org/wiki/Carrying\\_capacity#/media/File:Exponential\\_Carrying\\_Capacity.svg](https://en.wikipedia.org/wiki/Carrying_capacity#/media/File:Exponential_Carrying_Capacity.svg)

Hui, C (2006). "Carrying capacity, population equilibrium, and environment's maximal load". *Ecological Modelling*. **192** (1–2): 317–320. doi:10.1016/j.ecolmodel.2005.07.001.

Cliggett, Lisa (2001). "Carrying Capacity's New Guise: Folk Models for Public Debate and Longitudinal Study of Environmental Change". *Africa Today*. **48**: 3–19. doi:10.1353/at.2001.0003

Zimmerer, Karl S. (1994). "Human Geography and the "New Ecology": The Prospect and Promise of Integration" (PDF). *Annals of the Association of American Geographers*. **84**: 108–125. doi:10.1111/j.1467-8306.1994.tb01731