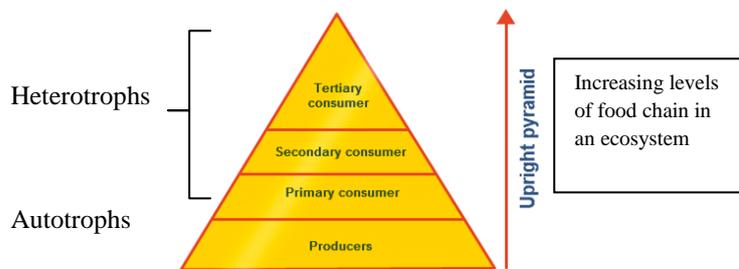


Key points for Topic: Ecological Pyramids

Ecological Pyramids: The concept of ecological pyramid was developed by **Charles Elton (1927)**, so these pyramids are also known as Eltonian pyramids.

An ecological pyramid is the graphical representation of trophic levels of a food chain, starting with producers (autotrophs, the green plants) at the base and successive trophic levels (heterotrophs, the consumers) forming the apex in an ecosystem. It depicts the number of organisms, biomass and productivity at each trophic level in an ecosystem.

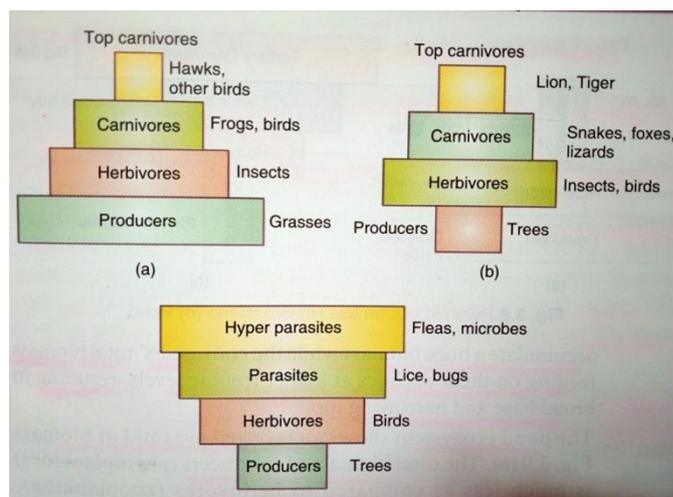


Graphical representation of the ecological pyramid

Ecological pyramids are of three types:

- 1) **Pyramid of numbers**
- 2) **Pyramid of biomass**
- 3) **Pyramid of energy**

1) Pyramid of numbers: The pyramid of numbers depicts the relationship in terms of the number of producers, herbivores and the carnivores at their successive trophic levels. There is a decrease in the number of individuals from the lower to the higher trophic levels. The number pyramid varies from ecosystem to ecosystem.



Pyramid of numbers

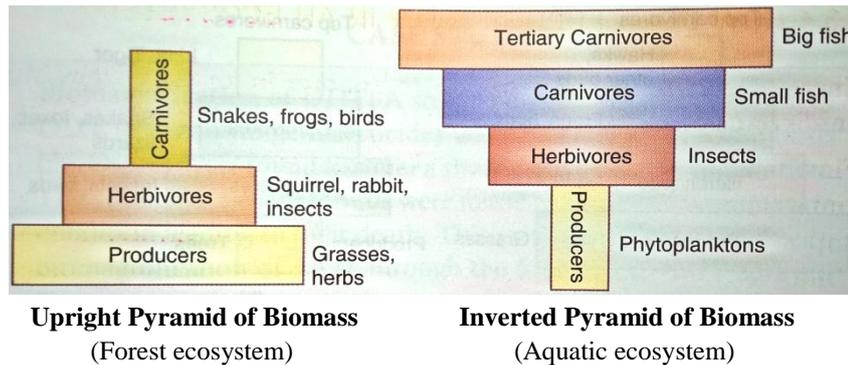
Units: (individuals per unit area or volume)

- (a) **Upright pyramid:** in the grassland & aquatic ecosystems.
- (b) **Partly Upright pyramid (spindle shaped):** in the forest ecosystem
- (c) **Inverted Pyramid:** in parasitic food chain.

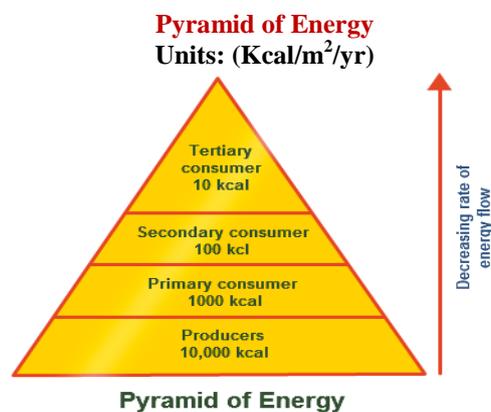
- 2) **Pyramid of Biomass:** Biomass may be defined as the total weight of dry matter present in the ecosystem at any one time. Pyramid of biomass is a graphic representation of biomass present per unit area in different trophic levels in a food chain. In this pyramid there is a gradual decrease in the biomass from the lower (producers) to the higher trophic levels. So, the pyramid is upright as in forest ecosystem. The pyramid of biomass can be also be inverted as in pond ecosystem as the biomass of producer is least.

Pyramid of Biomass

Units: (Dry weight of individuals per unit area or volume)



- 3) **Pyramid of Energy:** It represents the amount of energy transferred from one trophic level to the next in an ecosystem. The energy pyramid always upright and vertical. At each trophic level, there is successive loss of energy in the form of heat and respiration, etc.



Limitations of Ecological Pyramids:

- (i) It does not take into account the same species belonging to two or more trophic levels.
- (ii) It assumes a simple food chain and does not accommodate a food web.
- (iii) Saprophytes and decomposers are not given any place in ecological pyramids.

For detailed reading on this topic refer Ecology Book: P D Sharma, Chapter: Ecosystem: structure and Function