

Lindeman's 10% law

Or Raymond Lindeman's law of energy transfer

Or Law of 10%

B.Sc. Part-I, Paper-I, Group-B

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Ecosystem refers to the interactions of organism with one another and with their environment in which they occur. It constitutes the life supporting system.

The maintenance of ecosystem is dependent on two major processes

1. Energy Flow
2. Nutrient cycle

The 'orderly step wise step' transfer of energy from one trophic level to another or from producers to decomposers is called energy transfer.

Energy flow is always

- Unidirectional
- Non-cyclic

Some amount of energy is lost at each trophic level either as heat or used for various metabolic activities.

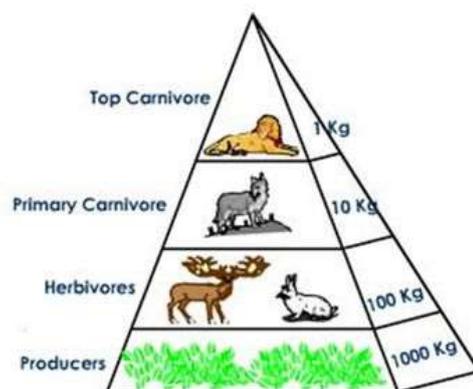
Lindeman was the first one to study the trophic efficiencies.

According to Lindeman's law of 10%, efficiency of energy transfer from one trophic level to another is 10% or we can say that only 10% of the net primary productivity of producers ends up as herbivores and so on to next trophic levels, during the transfer of organic food energy from one trophic level to the next higher level, only about ten percent of the transferred energy is stored as flesh. The remaining is lost during transfer, broken down in respiration, or lost to incomplete digestion by higher trophic level.

For example, the Sun releases 10,000 J of energy, then plants take only 100 J of energy from sunlight (exception- Only 1% of energy is taken up by plants from sun); thereafter, a deer would take 10 J (10% of energy) from the plant. A wolf eating the deer would only take 1 J (10% of energy from deer). A human eating the wolf would take 0.1J (10% of energy from wolf), etc.



Progressive Loss of Energy in Food Chain



Upright Pyramid of biomass in a Terrestrial Ecosystem

The ten percent law provides a basic understanding on the cycling of food chains. Furthermore, the ten percent law shows the inefficiency of energy capture at each successive trophic level.