ECOLOGICAL PYRAMID

There is some short of relationship between numbers, biomass & energy content of the primary producers, consumers of the first & second orders and soon to top carnivore in any ecosystem. These relationship may be represented in diagramative ways & are referred to as ecological pyramids.

or, we can say that at each step in the food chain a considerable portion of potential energy is lost as heat. As a result organism in each trophic level pass on lesser energy to the next trophic level than they actually received. This level the number of steps in any food chain to 4 or 5. Longer the food chain, the lesser energy is available for final numbers. Because of this tapering off of available energy in the food chain a pyramid is formed that is known as ecological pyramid. The higher step in the ecological pyramid, the lower the number of individuals & the larger their size.

The use of ecological pyramid was advanced by C. E. Elton 1927. There are different types of ecological pyramid. In each ecological pyramid producer level forms the base & successive levels make the apex. These types of pyramidal relation may be found among the organisms at different levels in the ecosystem.

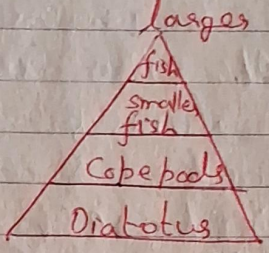
These are (i) Pyramid of number (ii) Pyramid of biomass (iii) Pyramid of energy or productivity. The shape of the first

two may be upright pyramidal, inverted pyramidal or any other shape but the third is alway upright pyramidal or triangle shaped.

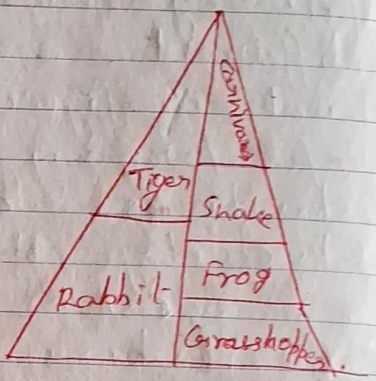
① PYRAMID OF NUMBERS → This deals with the relationships between the numbers of primary producers & consumers of different order. At the ~~such~~ base of such a figure is always the numbers of primary producers & the subsequent structures or this base are represented by the numbers of consumers at successive levels. The top represents the numbers of top carnivours in an ecosystem.

The pyramid of numbers of an ecosystem indicates that the producers are ingested in large ~~nn~~ numbers by smaller numbers of primary consumers. These primary consumers are eaten by relatively smaller number of secondary consumers & these secondary consumers in turn are consumed by only a few tertiary consumers. This type of pyramid is best represented by taking an example of lake ecosystem. In this type of pyramid the base trophic level is occupied by producers elements algae, diatoms & other hydrophytes which are most abundant. In this second trophic level come the herbivorees or zoo planktons which are lesser in number than producers. The third trophic level is occupied by carnivorees which are still smaller in

numbers than the herbivores & the top occupied by a few top carnivores. Thus the ecological pyramid of numbers there a relative reduction in number of organism & increase in the size of bod from base to apex of the pyramid.



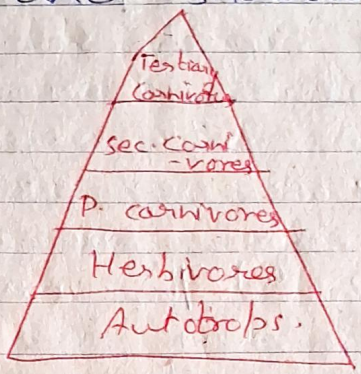
P. O.N. of a lake ecosystem.



Upright P. O.N. in a herbaceous ecosystem.

PYRAMID OF BIOMASS → The living weight or biomass of the members of the food chain present at any one time forms the pyramid of biomass of organisms. This is indicated by weight or other means of measuring materials. ~~The total bulk of organisms fixed energy present at any one time.~~ Pyramid Pyramid of biomass indicates the decrease of biomass in each trophic level from base to apex eg. total biomass of the ~~herbivores of~~ producers consumed by herbivores is more than the total biomass of the herbivores. Like wise the total biomass of secondary consumers will be lesser than that of herbivores & ~~so~~ so on. Since some energy & material is lost in each succession line. The total

mass supported at each level is limited by the rate at which the energy is being stored below. This usually gives stable upright pyramid for most of communities in terrestrial and shallow nature ecosystems.



PYRAMID OF ENERGY → This depict ~~not only~~ the amount of total energy utilized by the organism at each trophic level of food chain. ~~but more important. The actual role in various organism assume in transfer of energy.~~ In the ~~below~~ producers level the total energy will be much greater than the energy at the successive higher trophic level. some producers organisms may have small biomass but the total energy they assimilates & pass on to consumers may be greater than that of organisms with much longer biomass. Higher trophic levels are more efficient in energy utilization but much heat is lost in energy transfer. Energy lost by respiration also progressively increase from lower to higher trophic state.

Green plants fix solar energy & accumulate it in the organic material in chemical form. The energy accumulated by producers is called production or more