

### **Introduction**

Ecological engineering has emerged as an integration of ecology and engineering concerned with the design, monitoring and construction of human relationship with ecosystem for exchange of energy, food and waste.

Ecotechnology is an applied knowledge and skill that searches for accomplishing human needs with minimal ecological disruption, by binding and subtly maneuvering natural forces to leverage their beneficial effects.

Ecotechnology is essentially the discipline of sustainable development and cities of the world. Ecological engineering can facilitate restoration and preservation of the environment health for the survival, development and economy of society through the integration of engineering and ecological principles with modernizing trends of market and development. An ecologically resounding approach to engineering considers that nature responds comprehensively, persistently and cumulatively. Ecotechnology operates within the borders of ecosystem rather than flouting or disregarding or overcoming or overpowering it.

Ecotechnology has the essence of the evolution of combined and shared ecological wisdom from the beginning of life on the earth billions of years ago to the present with demonstrated expression of multi-species intelligence.

Ecological engineering and eco-technologies are dependent on the self -designing, resilient abilities of ecosystems and their natural biotic and abiotic forces.

### **Application of Ecotechnology**

Applications of ecological engineering principles, environmental chemistry, microbiology, interactions of organisms and succession of biological communities are very useful to consume organic and inorganic pollutants from the wastewaters and bioconvert them into non-toxic form, finally transferring the elements in the ecological cycles.

These eco-transformations, eco-conversions and degradation or bio-utilization of pollutants - nutrients are the part of ecological cycles - biogeochemical cycles. In the ecotechnology, attempt has been made to apply natural flora and fauna in well-designed manner to develop technologies like Green Bridge, Green Lake Eco-Systems, Green channel, biox (biological oxidation) and Stream Eco-Systems.

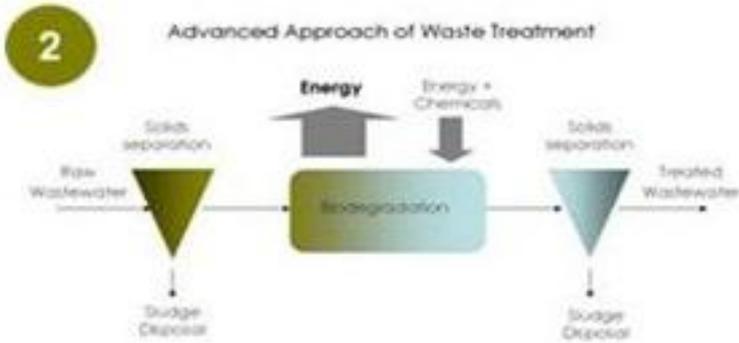
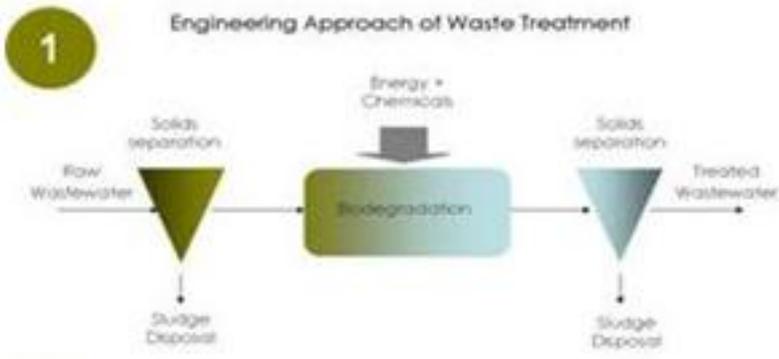
The successful implementation of the scheme with natural technologies like Green Bridge, Green Lake and Stream Eco-System implied that the ecotechnology can be employed to treat the waste streams coming from the non-point sources. This can be very economical, say capital expenditure can be 5 - 10% of the total for conventional mechanized aerobic and anaerobic treatment systems.

### **Cost Effectiveness of Ecotechnology**

1. Ecotechnological system's capital expenditure is comparable with the annual operational cost of conventional bioremediation systems.
2. Ecotechnological systems can be developed and operated in combination with conventional systems to improve the performance of the latter.
3. Ecotechnological systems reduce the ecotoxicity of the man-made substances released into the water bodies and facilitate the eco-assimilation those pollutants into the ecological cycles thus reducing the quantum of hazardous residues to zero which otherwise require costly secured landfill and incineration techniques.

### **Why Ecotechnology?**

- No chemicals
- No machinery
- No electricity
- No hazardous waste generated
- 99% odour free treatment
- 99% control of mosquitoes and flies
- Helps reduce climate change (Green house effect)
- Enormously space saving
- Low investment
- Minimal maintenance
- Minimal operating cost
- Short lead time
- Fast return on investment
- Single stage process, tailor made solutions



**Pollution Control Results** Reduction 80% reduction | COD/BOD reduction - 40-90%  
 Increment 200% Reduction in sludge volume | Reduction in sludge volume - 200%  
 Microbial biomass - 200% Reduction in sludge volume | Reduction in sludge volume - 200%  
 ecotoxicological substances and a significant reduction in operation and maintenance costs