

RESOURCES AND THEIR ECOLOGICAL MANAGEMENT

Natural resources

Natural resources are the resources available in a nature like air, water, sunlight, soil, minerals, forests, wild life etc.

Natural resources are of two main types. They are renewable and non-renewable natural resources.

i) Renewable natural resources :-

Those resources which can be replenished in a short period of time like air, water, sunlight, forests etc.

ii) Non-renewable natural resources :-

Those resources which cannot be replenished in a short period of time like minerals (coal, petroleum, natural gas, metals etc.) because they take millions of years to be formed.

NATURAL RESOURCES



2) The Three R's to save the environment :-

The three R's to save the environment are Reduce, Recycle and Reuse.

i) Reduce :- means using less of natural resources and avoiding wastage of natural resources.

ii) Recycle :- means the materials like paper, plastic, glass, metals etc used for making things can again be used for making new things instead of synthesising or extracting new paper, plastic, glass or metals.

iii) Reuse :- means using things again and again like the plastic bottles



Deforestation

- Cutting down of the forest at large scale

Total forest of the world in

- 1900 -----7,000 million hectare.
- 1975----- 2890 million hectare.
- 2000-----2,300 million hectare.

Causes of deforestation

- Shifting cultivation
- Fuel requirements
- Raw materials for industrial use
- Development projects
- Growing food needs
- Overgrazing
- Forest fires

Consequences of deforestation

- It threatens the existence of many wildlife species due to destruction of their natural habitat.
- Biodiversity is lost and along with that genetic diversity is eroded.
- Hydrological cycle gets affected, thereby influencing rainfall.
- Problems of soil erosion and loss of soil fertility increase.

- In hilly areas it often leads to landslides
- More carbon is added to the atmosphere and global warming is enhanced.

Forest management

- Afforestation : planting trees on barren land
For one tree cut 10 trees should be planted

Afforestation done by three ways :

Commercial forestry

Social forestry

Agroforestry

c) Conservation of forests :-

Forests can be conserved by :-

- i) Afforestation - planting of more trees.
- ii) Preventing or reducing deforestation.
- iii) Preventing over grazing by cattle.
- iv) By setting up wildlife sanctuaries, national parks, biosphere reserves etc.



Coal and petroleum are important sources of energy



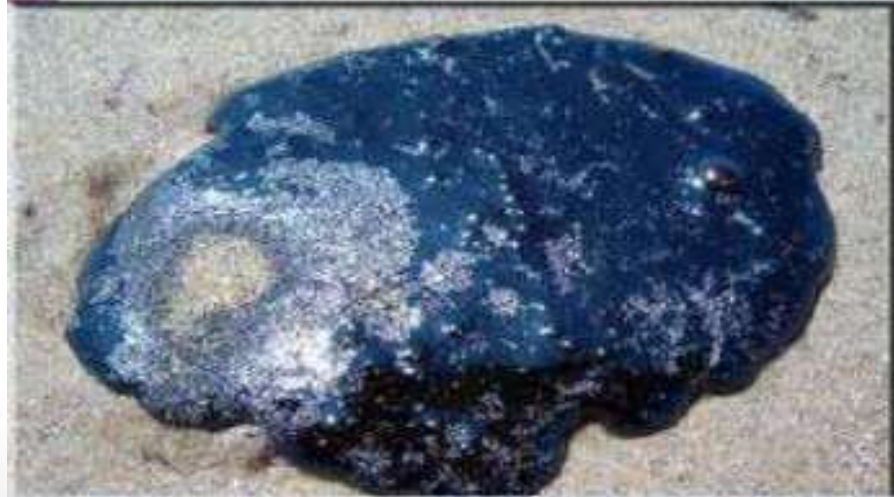
7) Coal and petroleum :-

Coal and petroleum are fossil fuels formed by the decomposition of dead plants and animals inside the earth after several millions of years. They are non-renewable sources of energy.

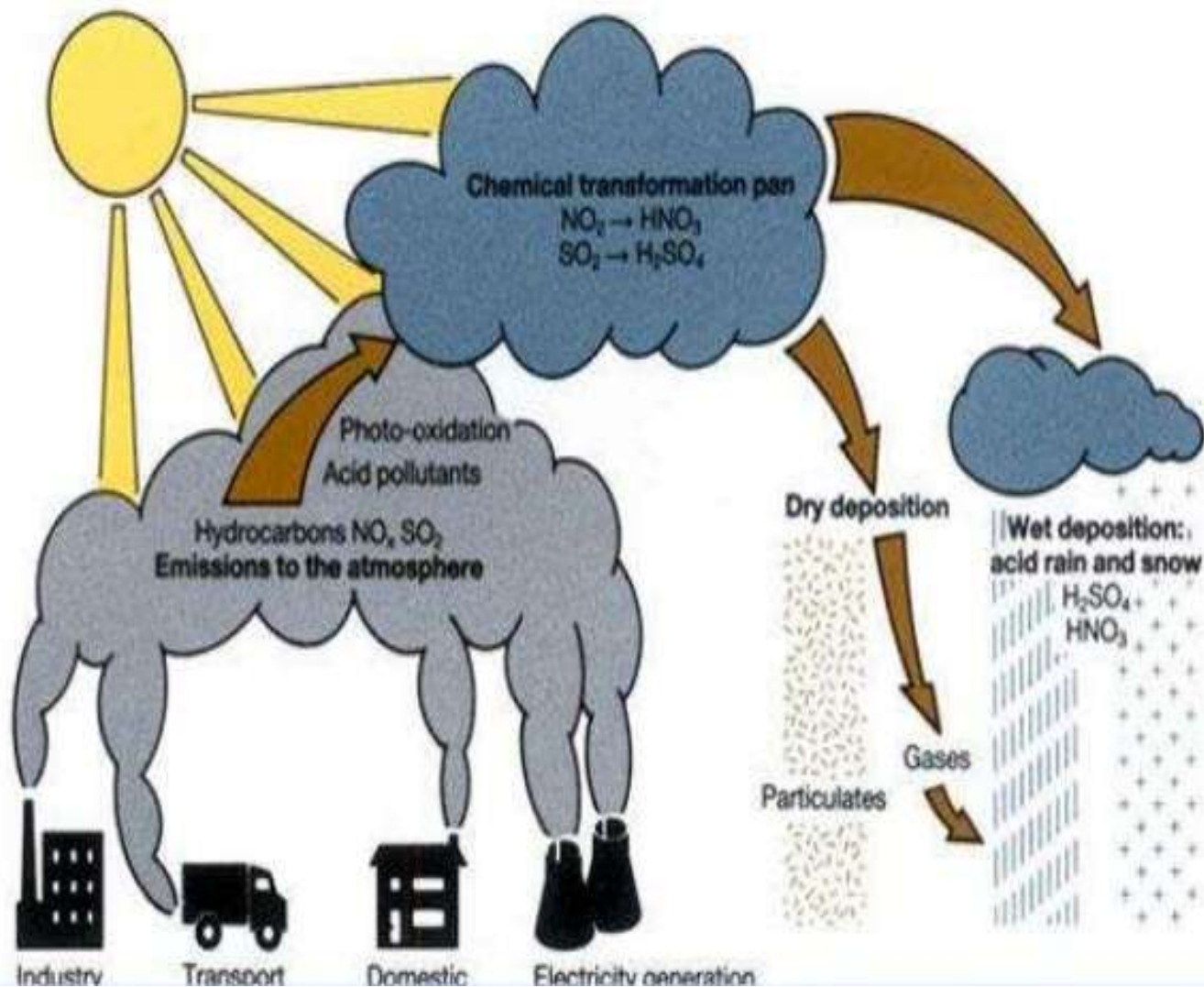
Petroleum reserves may last for about 40 years and coal reserves may last for about 200 years.

Coal and petroleum contain carbon, hydrogen, nitrogen and sulphur. When they are burnt, they release carbon dioxide and oxides of nitrogen and sulphur.

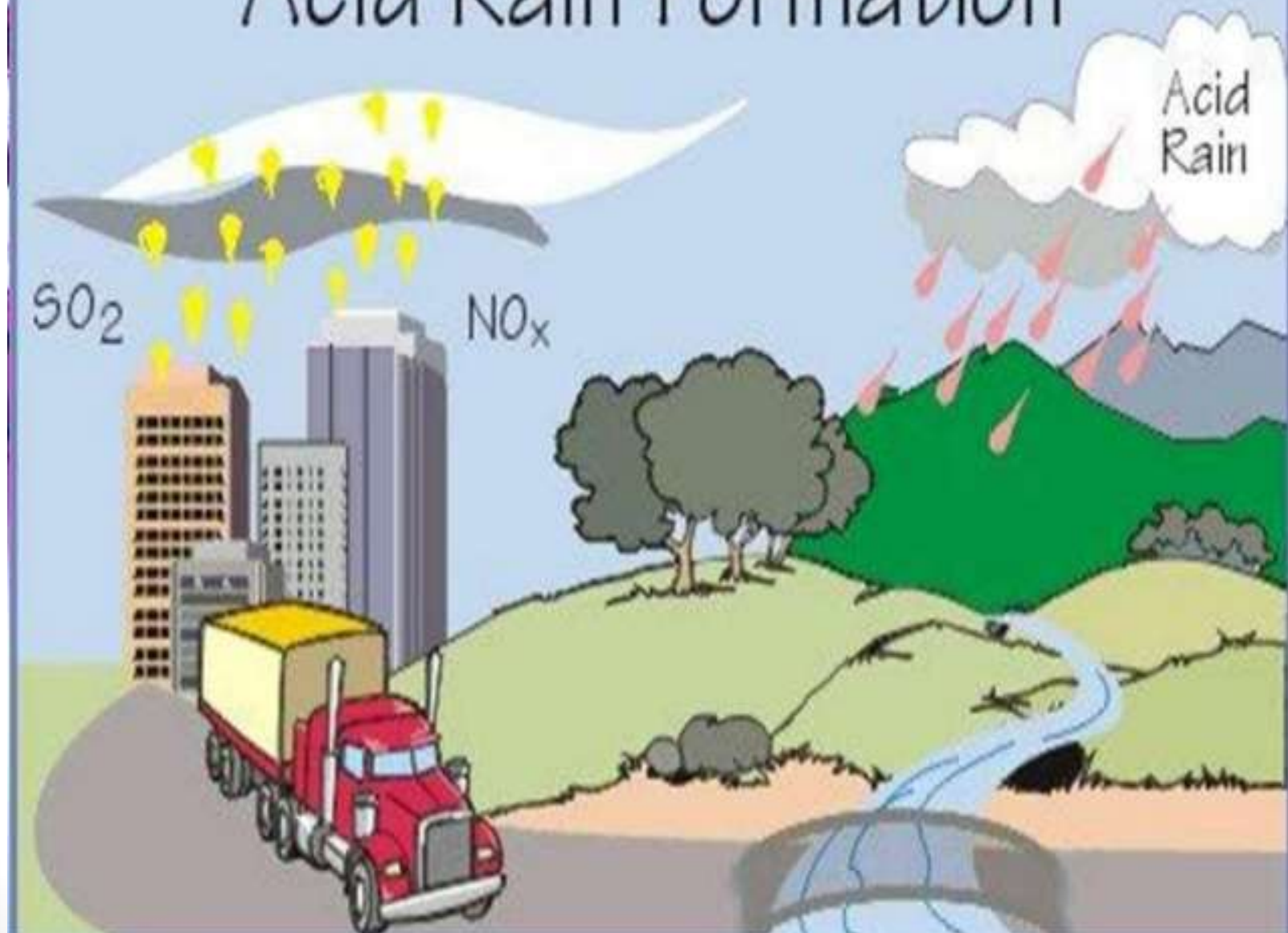




How acid rain is formed



Acid Rain Formation



MELTING OF POLAR ICE

RISE IN SEA LEVELS



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Wyoming coal mine. Coal, along with many other resources is harvested at a vastly unsustainable rate.



A temporary oil drilling rig in Western Australia

2. Mineral resources

One of the major kinds of non-renewable resources. Mineral resources are not uniform throughout the earth.

Minerals

- Are naturally occurring ,inorganic ,crystalline solids having a definite chemical composition and characteristics physical and chemical properties.

Types of minerals

- Critical minerals are essential for the economy of a nation like aluminium, copper, gold
- Strategic minerals are those required for the defence of a country eg Manganese ,cobalt, platinum,chromium.

Based on properties minerals are
2 types

Metallic minerals

- **Under this category are mainly iron, non-ferrous metals, silver and gold are important.**

Non Metallic minerals

- Eg graphite, diamond, silver & platinum.

Mining

- Is the extraction of minerals and coal from earth surface

Mining are of 2 types

Surface mining

Sub surface mining

Devegetation and defacing of landscape

- Topsoil and vegetation is removed from mining area to get assess of minerals
- Large scale deforestation or Devegetation leads to ecological loss
- Landscape get badly affected
- Huge quantities of debris and alongwith big scar and disruption of spoil aesthetic value
- Make more prone to soil erosion.

Definition of Range Management

- Range management is the use of **grazing land** to ensure consistent livestock production and, at the same time, conserve **range resources**. (Glossary of Environment Statistics)
- A distinct discipline founded on ecological principles and dealing with the use of rangelands and range resources for a variety of purposes. These purposes include use as watersheds, wildlife habitat, grazing by livestock, recreation, and aesthetics, as well as other associated uses. (*Society for Range Management.*)
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Why are rangelands important?



IMPORTANCE OF RANGE

- ▶ Rangeland is largely used for grazing livestock
- ▶ Rangelands also provide habitats for wildlife
- ▶ provide watersheds for use by surrounding communities
- ▶ Aesthetic point of view
- ▶ Provide food



RANGE MANAGEMENT

Arthur William Sampson



Father of Range Management

- ▶ Oakland, Nebraska
(1884-67)
- ▶ Plant Ecologist in U.S.
Forest Service
- ▶ first Director of the
Great Basin Forest
Research Station in the
Wasatch Mountains

Management of range

- ▶ Herbicides spraying to reduce invasive
- ▶ Replacing barren areas that have been overgrazed
- ▶ Mechanical removal of non-native species
- ▶ Rotational grazing of cattle
- ▶ Fencing off reserved areas where grazing is never allowed



Desalination

- Desalination is the process of removing dissolved minerals from brackish or seawater to produce freshwater



Why Desalination?

Salt Water is Abundant, but Fresh Water is Not
Distribution of the World's Water Resources



Source: World Business Council for Sustainable Development, United Nations World Water Development

Ocean	Average Salinity (gms./lit)
Atlantic	35.4
Indian	34.8
Pacific	34.5
Brackish Waters	0.5 to 3

Desalination Basic Considerations

- Demand for fresh water (domestic use, industry, agriculture.....)
- Lack of conventional water sources
- Availability of salt water
- Availability of Infrastructure (energy, water distribution network)
- Interest for financing (invest, maintenance, energy,...)

WEATHER MODIFICATION

❖ Weather modification is the intentional effort of man to manipulate or alter the naturally occurring weather with certain aspects of the environment to produce desirable changes in weather for the benefit of someone.

❖ The best-known kind of weather modification is cloud seeding, with the goal of producing rain or snow, suppressing hails (which can ruin crops), or weakening cyclones and hurricanes.

❖ Weather control can have the goal of preventing damaging weather, such as hurricanes or tornadoes, from occurring; of causing beneficial weather, such as rainfall in an area experiencing drought; or of provoking damaging weather against an enemy or rival, as a tactic of military or economic warfare.

❖ Weather modification in warfare has been banned by the United Nations.



**An airplane spraying the nucleating agents
into the clouds**



We would need to look for alternative sources of energy



A landscape is what you see in your surroundings or in an area of land. e.g.,

- Natural Elements
- Things built by people



Landscap es



..water.. animals.



..plantlife.. rocks.



.houses.



..roads..



tunnels.



coast



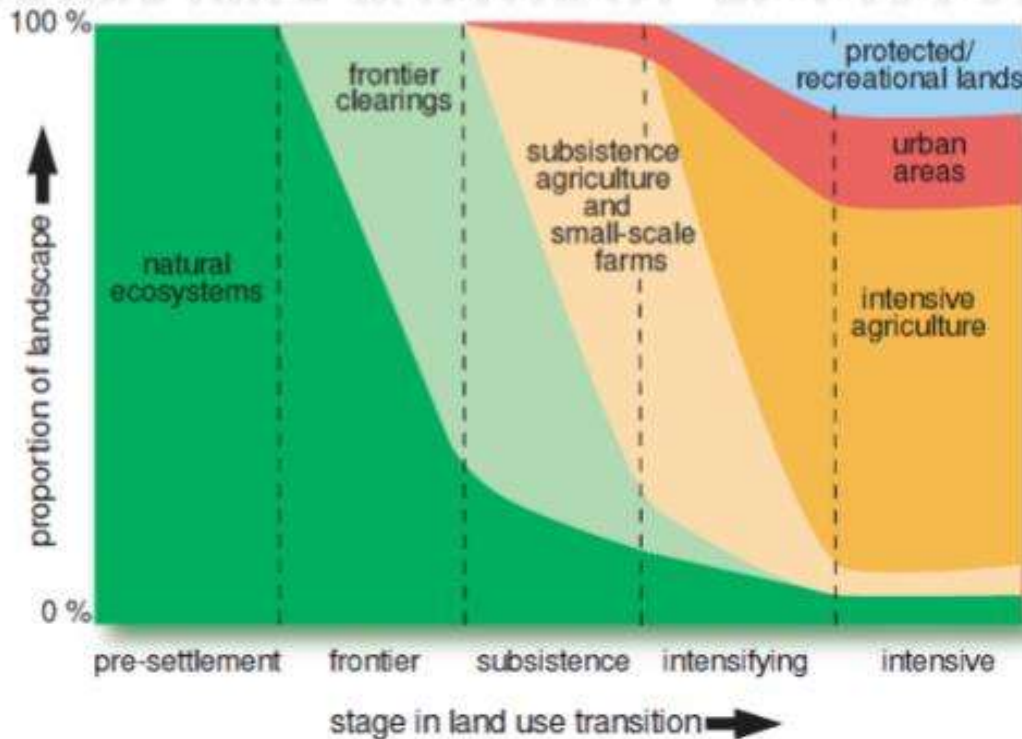
beach



cliff



SHRINKING NATURAL ECOSYSTEMS



- Are land-use activities degrading the global environment in ways that may ultimately undermine ecosystem services, human welfare, and the long-term sustainability of human societies?



OVERALL CONCLUSIONS

- Modern land-use practices, while increasing the short-term supplies of material goods, may **undermine many ecosystem services** in the long run
- Must develop land-use strategies that recognize short and long-term needs and balance ecosystem services
- Important to **include land-cover change** in forcing scenarios for future climate studies
 - Reveals the effects humans have on Earth's climate



THE FUTURE

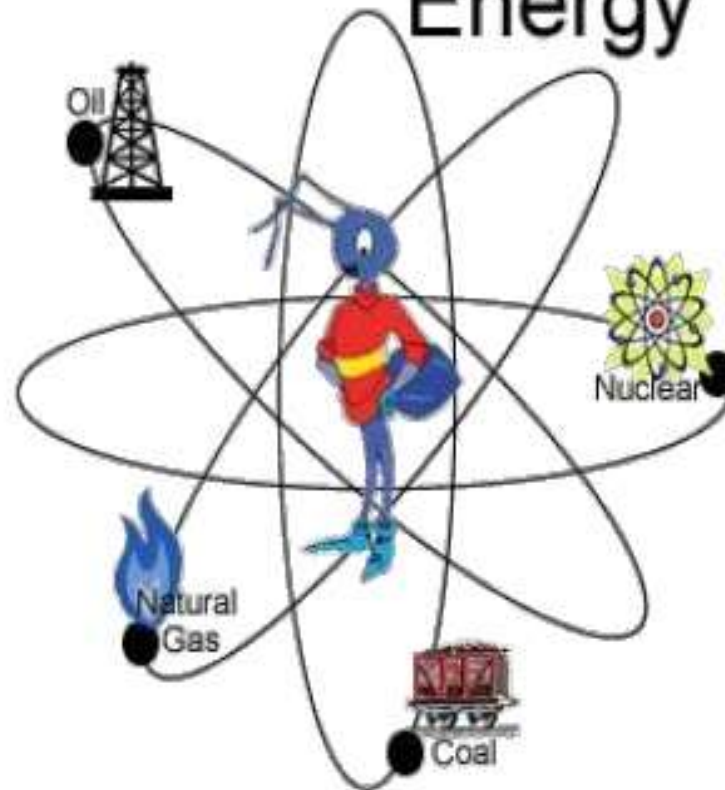


- Continue developing **land-use strategies**
 - Ex: Coffee farms within ~1km of forests benefit from wild pollinators, increasing yields by 20%
- **Closer collaboration** between scientists and practitioners
 - Ecologists and land-use planners
 - Climatologists and architects
- Find a balance
 - Between meeting human needs and maintaining ecosystems
- Inclusion of land-cover change in future climate models show us that we must take care of our Earth **today!**

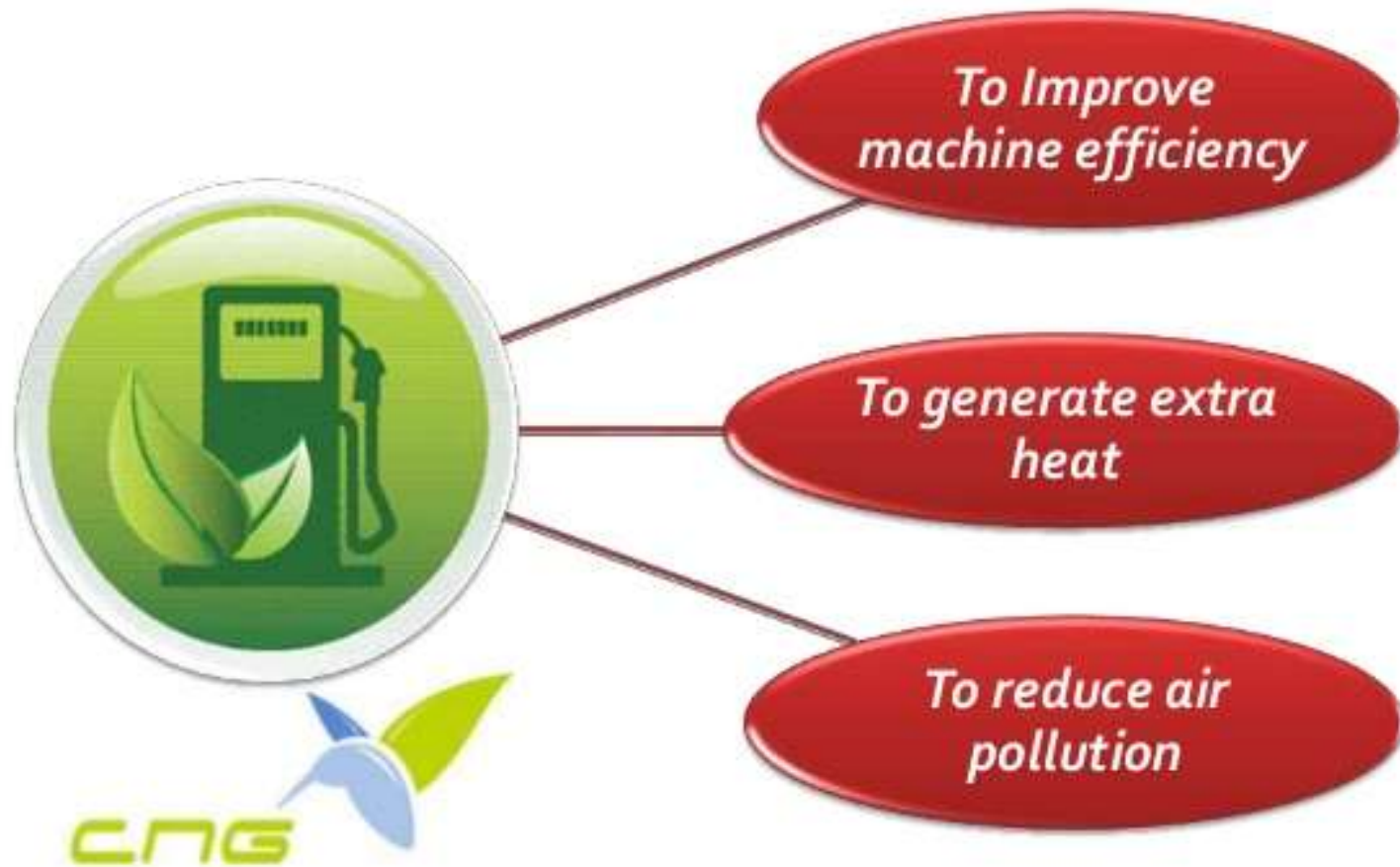


These are resources that will be exhausted in the future

Non-Renewable Energy



We need to use these resources judiciously



Difficult but achievable



Collective efforts required



References

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<https://www.slideserve.com/geneva/deforestation-land-use>