

MADAGASCAR--AN EXAMPLE OF A TROPICAL FOREST IN DANGER

Madagascar-unfortunately only one example

Island off the east coast of Africa

4th largest island in the world

The Island is 1000 miles long and 350 miles wide at its widest point

Roughly the area of California and Arizona combined

1998 population estimates 15,057,000

50% of the population is under 15 years of age

At present growth rate by 2050 projected population estimates are 40,438,000

Rice is the carbohydrate staple. All 15,000,000 people eat rice 3x daily with a little plate of meat (fish, beef, chicken, or pork) in a light tomato sauce and a cup of boiled water

Population dependant on charcoal for energy

Only 20% of native rainforest is left

No program to reforest with native trees

Replant non-native *Eucalyptus* near roads close to settlements to provide charcoal

Erosion is widespread and severe.

Space shuttle astronauts have seen the erosion plume spreading far into the Indian Ocean from the main rivers

Tropical rainforests are important

Along with coral reefs and algal beds, they are the most productive biome in the world

i.e. they produce more biomass per square meter than any other

No other ecosystem comes close to tropical rainforests in terms of species diversity

Ex. in the taiga (northern boreal forest) trees might be limited to one or two species

In the Amazon, more than three hundred species of trees have been identified in a single hectare of land (2.5 acres).

Ex. one researcher found 1,700 species of beetles in on tree in the Peruvian rainforest.

Ex. half of all identified plant and animal specie on Earth reside in tropical rainforests (which occupy only about 7% of the Earth's surface).

Tropical rainforests are disappearing

Tropical rainforests are being burned down or cut down.

One estimate is that more than 35 hectares (86 acres) are lost each minute.

Why are rainforests disappearing?

Traditional slash/burn agriculture (not much anymore)

Harvest valuable timber trees

Clear the land for grazing cattle and other more profitable pursuits

Why worry about the rainforests?

Poor soil, bountiful covering

In the grasslands of the "bread belt" 90% of ecosystem nutrients are held in the soil.

In tropical forests almost all of the richness is contained in the extensive forest

canopy.

Organic material dropping to the forest floor is rapidly decomposed and the root systems immediately absorb the nutrients

The nutrients bypass the soil, going from plant to decomposer and back to

plant

Therefore the soil never gets built up and it stays nutrient poor and often

acidic.

Results?

When rainforest is cleared for agriculture, the nutrient-poor land will support a year or two of crops and that's it--no more rainforest, no more crops.

The new crops don't build up the soil

Nutrients are leached out by the heavy rains

Habitat for animals is lost

Massive rate of extinction

Global Warming & Carbon dioxide

increase of a few to many degrees in the average global temperature of Earth

significance:

- CO₂ in the atmosphere is a major factor regulating the loss of heat into space

problem:

- Since 1900 the CO₂ content of the atmosphere has risen from 280 ppm to 350 ppm
- burning of fossil fuels and clearing of forests are returning CO₂ to the atmosphere faster than plants can remove it
 - less CO₂ -- Earth is cooler
 - more CO₂ -- Earth is warmer

The enormous biomass of the rainforests locks up carbon

- Cutting the forest results in increase of the greenhouse gas, carbon dioxide.
- Losses from the Brazilian Amazon alone amounts to hundreds of millions of tons of CO₂ into the atmosphere each year.

The concern is that loss of rainforest will affect greenhouse warming

The concern is that loss of rainforest will affect global climate in ways we can't even anticipate yet.

- resultant changes in rainfall pattern
- changes in location and arability of agricultural lands
- rises in sea levels

Loss of species diversity

There is a value in preserving plant, animal and fungal species purely from self-interest

The potential for new medications is tremendous

Food webs are likely to be destroyed in ways we can't even anticipate yet.

How can poor nations progress when population growth:

- hastens degradation of the environment
- threatens development

Sustainability--the ability to be maintained

Ideal sustainable system characterized by:

1. **Stability**--must operate to neither upset ecological systems nor overexploit living organisms
2. **Resilience**
3. **Use of appropriate technology**
4. **Efficiency and satisfactory productivity**
i.e. improve the economy

Doctrine of Sustainability

1. Economic growth and development must take place and be maintained over time
2. The spread of a reasonable level of prosperity and security to less developed nations is essential to protecting ecological balance and thus essential to the continued prosperity of wealthy nations
3. Environmental protection and economic development are complementary rather than antagonistic

Creating a **RENEWABLE SYSTEM!!**

Attaining Global Sustainability is going to be contingent on 3 realizations:

1. **The human species is part of nature.**

Its existence depends on its ability to draw sustenance from a finite natural world
Its continuance depends on its ability to abstain from destroying the natural systems that regenerate this world

2. Economic activity must account for the environmental cost of production

i.e. it must reflect environmental cost

3. The maintenance of a livable global environment depends on the sustainable development of the entire human race