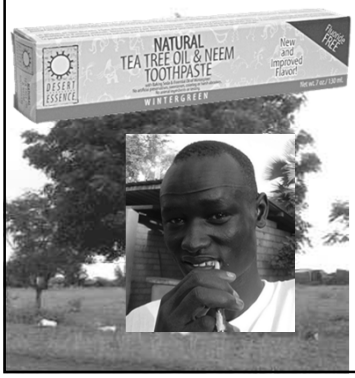
Ch. 13
DEFORESTATION / BIODIVERSITY LOSS



What's a Neem Tree Worth?

Quick growing; fuel-wood; lumber; natural pesticide of over 200 insects; bark, seed, flower, and leaf extracts fight bacterial, viral and fungal infections, diabetes, leprosy, high blood pressure, ulcers, tooth decay, gum disease; seed oil makes soap, toothpaste, spermicide, nail polish.

The "Value" of Forests?

Ecological services value – oxygen, air purification, soil fertility, erosion control , water recycling, humidity control, habitat ≈ $200,000

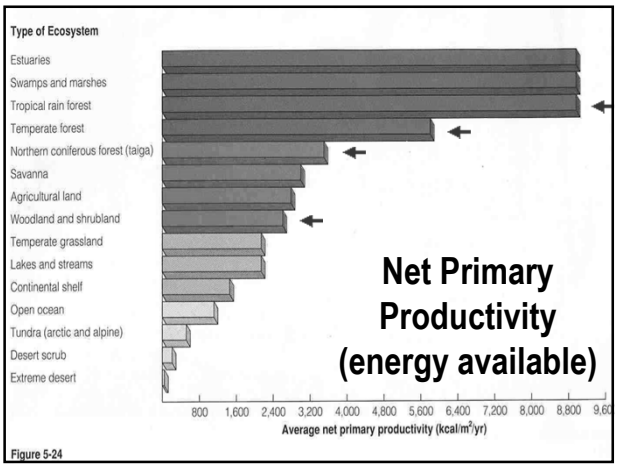


Figure 5-24

- According to the National Cancer Institute, at least ***70 percent of new drugs*** introduced in the United States in the last 25 years are derived from natural sources (Steenhuysen, 2007).
- Compounds, such as one recently discovered in a plant in Madagascar, are likely to provide novel antibiotics and help curb the epidemic of antibiotic-resistant diseases (Wang et al., 2006).

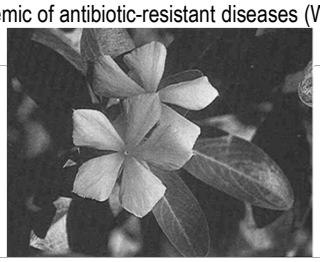
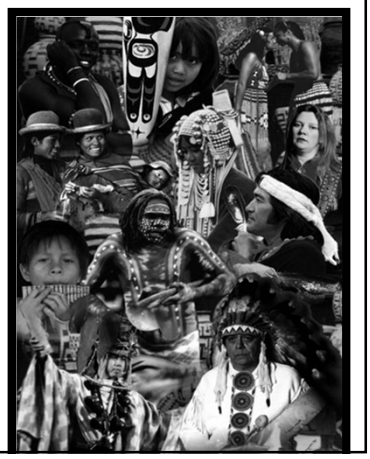


Figure 13-9: Rosy periwinkle – cures leukemia and Hodgkin's disease

- Once we find a medically beneficial compound in a plant we can grow it in a monoculture to have a large available supply.

Pacific Yew – source of Taxol to fight uterine cancer

Indigenous cultures displaced for resources = cultural extinction



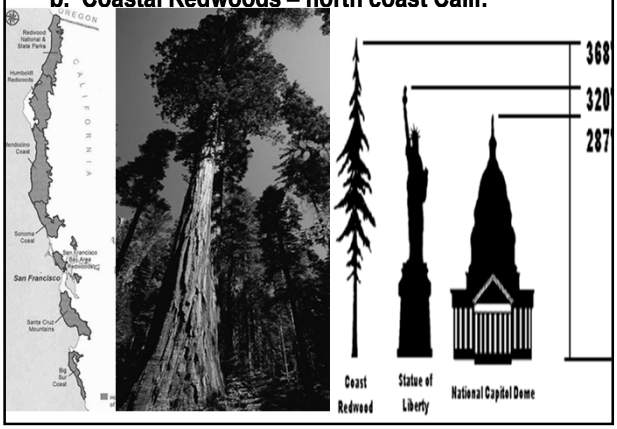
Forests Types

Old Growth - Virgin (uncut) and regenerated (not cut for 300-1000 years)

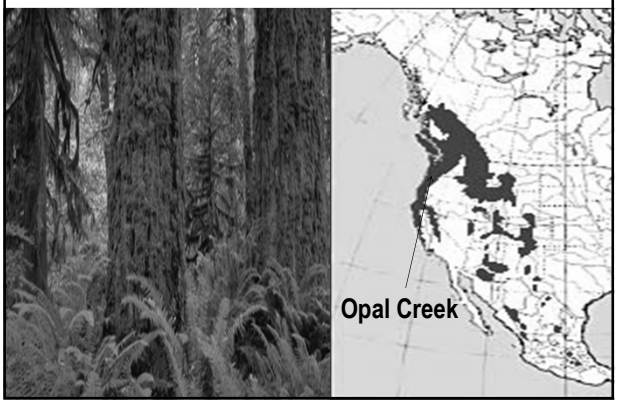
a. Giant Sequoia – southern Sierra Nevada

	Feet
Height above Base	274.9
Circumference at Ground	102.6
Maximum Diameter at Base	36.5
Diameter 60' (18.3 m) above base	17.5
Diameter 180' (54.9 m) above base	14.0
Diameter of Largest Branch	6.8
Height of First Large Branch above the Base	130.0
Average Crown Spread	106.5

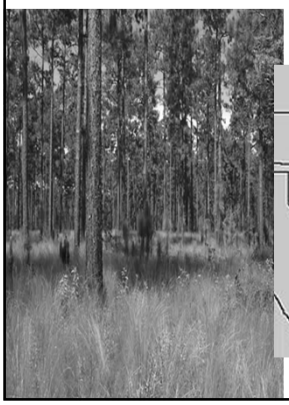
b. Coastal Redwoods – north coast Calif.



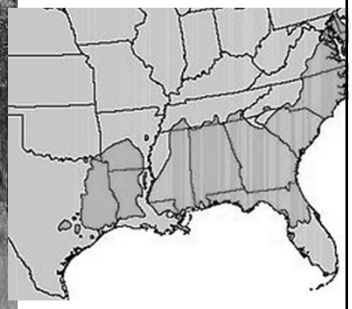
c. Douglas Fir – Washington state



d. Loblolly Pine – southeast U.S.

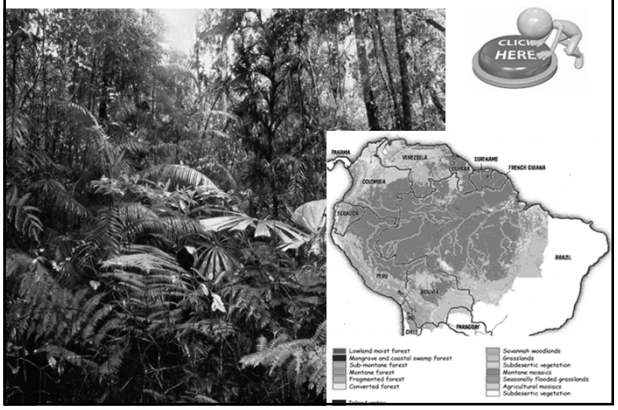


Not a lot of inertia!



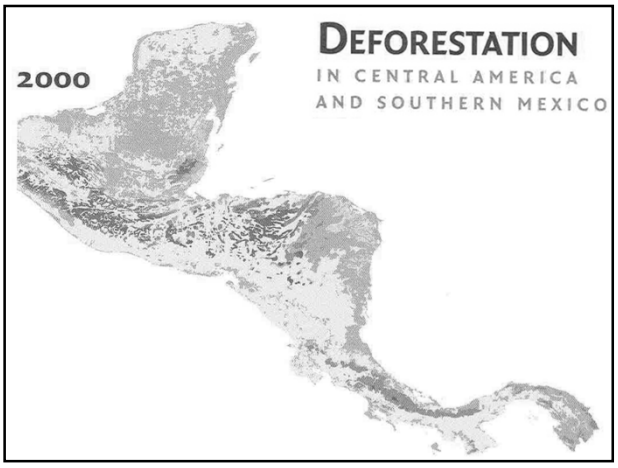
Taiga or Boreal Forest (Evergreen coniferous), Canada , Russia, Alaska

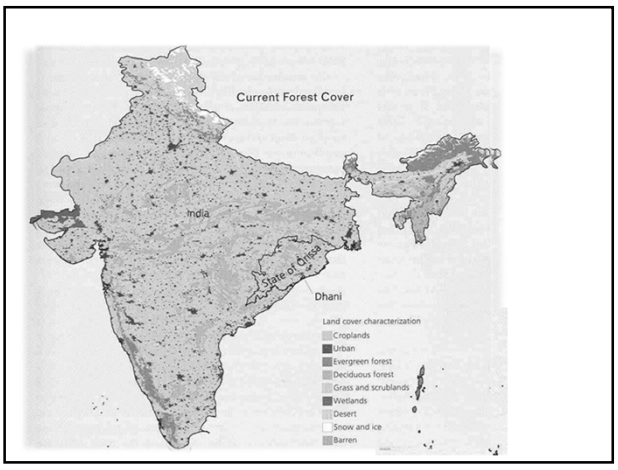
f. Tropical rainforests – Brazil

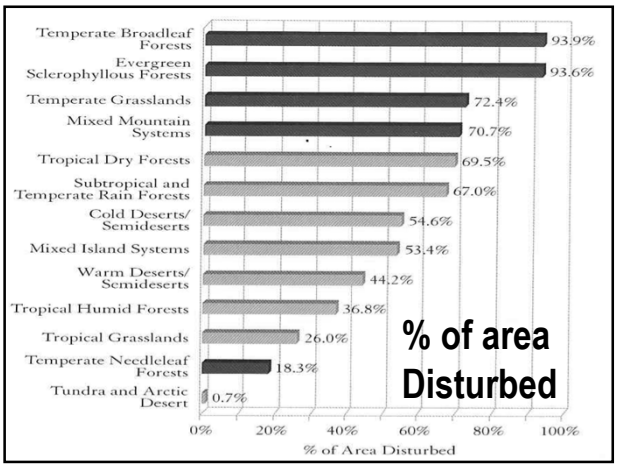


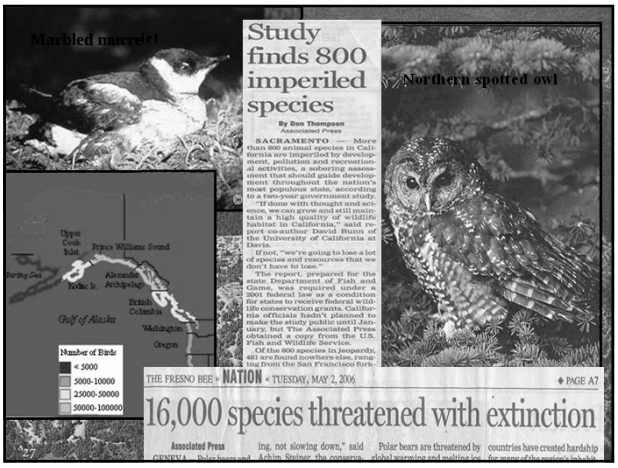
Biodiversity

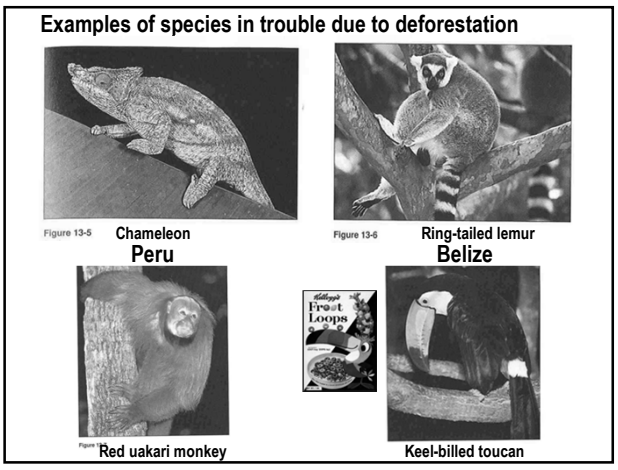
The Issue

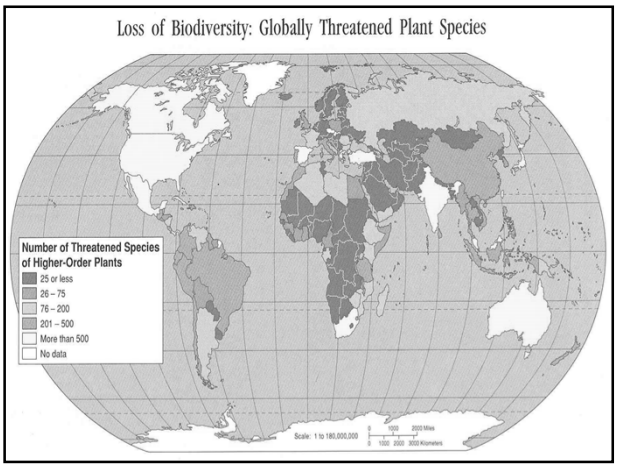

2000
DEFORESTATION
IN CENTRAL AMERICA
AND SOUTHERN MEXICO

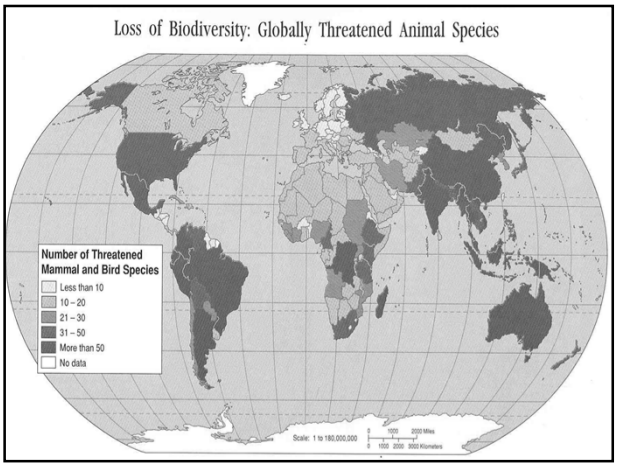

Current Forest Cover
India
State of Orissa
Dhani
Land cover characterization
Croplands
Urban
Evergreen forest
Deciduous forest
Grass and scrublands
Wetlands
Desert
Snow and ice
Barren


Temperate Broadleaf Forests
93.9%
Evergreen Sclerophyllous Forests
93.6%
Temperate Grasslands
72.4%
Mixed Mountain Systems
70.7%
Tropical Dry Forests
69.5%
Subtropical and Temperate Rain Forests
67.0%
Cold Deserts/ Semideserts
54.6%
Mixed Island Systems
53.4%
Warm Deserts/ Semideserts
44.2%
Tropical Humid Forests
36.8%
Tropical Grasslands
26.0%
Temperate Needleleaf Forests
18.3%
Tundra and Arctic Desert
0.7%
0%
20%
40%
60%
80%
100%
% of Area Disturbed
% of area Disturbed

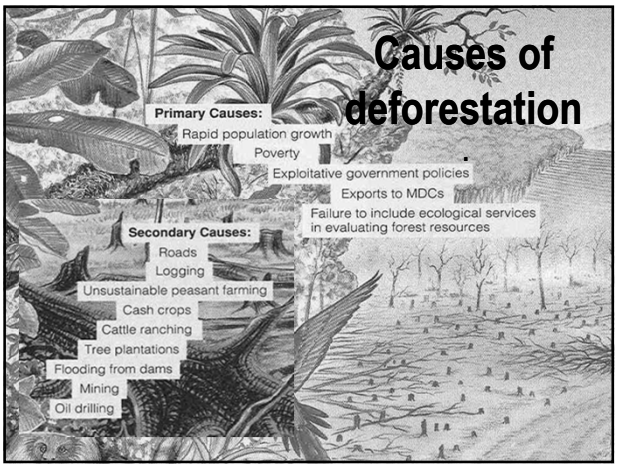

Marbled murrelet
Study finds 800 imperiled species
By Don Thompson
Associated Press
SACRAMENTO — More than 800 animal species in California are imperiled by development, pollution and recreational activities, a sobering assessment that should guide development throughout the nation's most populous state, according to a two-year government study.
"If done with thought and science, we can grow and still maintain a high quality of wildlife habitat in California," said report co-author David Bunn of the University of California at Davis.
If not, "we're going to lose a lot of species and resources that we don't have to lose."
The report, prepared for the state Department of Fish and Game, was required under a 2001 federal law as a condition for states to receive federal wildlife conservation grants. California officials hadn't planned to make the study public until January, but The Associated Press obtained a copy from the U.S. Fish and Wildlife Service.
Of the 800 species in jeopardy, 481 are found nowhere else, ranging from the San Francisco fork-
Northern spotted owl
Upper Cook Inlet
Prince William Sound
Bering Sea
Aleutian Archipelago
Kodiak Is.
British Columbia
Gulf of Alaska
Washington
Oregon
Number of Birds
< 5000
5000-10000
25000-50000
30000-100000
THE FRESNO BEE • NATION • TUESDAY, MAY 2, 2006
♦ PAGE A7
16,000 species threatened with extinction
Associated Press
ing, not slowing down," said
Polar bears are threatened by
countries have created hardship

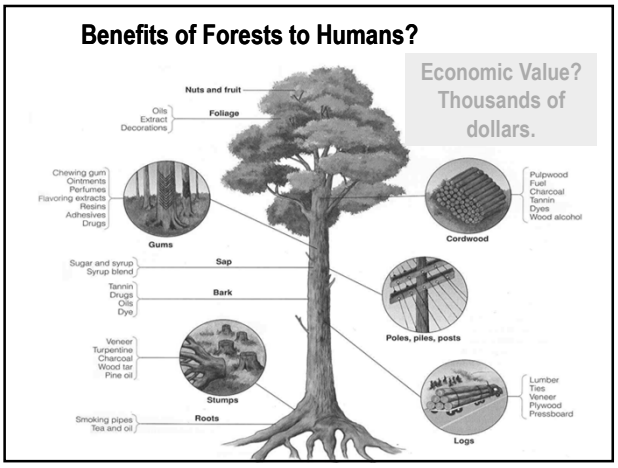

Examples of species in trouble due to deforestation
Figure 13-5
Chameleon
Figure 13-6
Ring-tailed lemur
Peru
Belize
Red uakari monkey
Keel-billed toucan

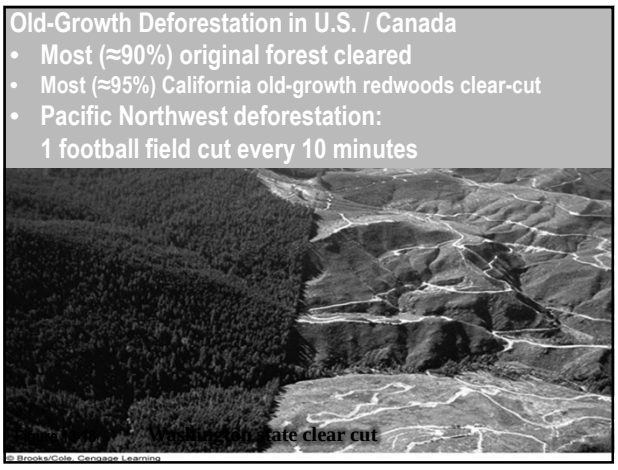


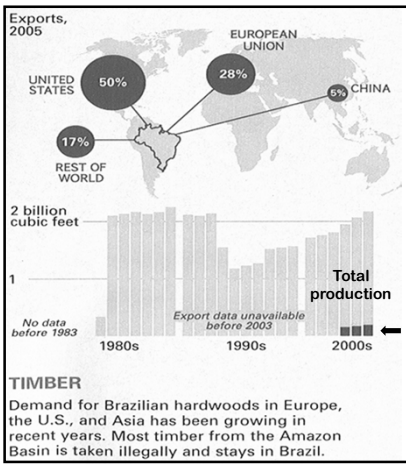


The OTHER "Value" of Forests?


Causes of deforestation
Primary Causes:
Rapid population growth
Poverty
Exploitative government policies
Exports to MDCs
Failure to include ecological services in evaluating forest resources
Secondary Causes:
Roads
Logging
Unsustainable peasant farming
Cash crops
Cattle ranching
Tree plantations
Flooding from dams
Mining
Oil drilling


Benefits of Forests to Humans?
Economic Value? Thousands of dollars.
Nuts and fruit
Oils Extract Decorations
Foliage
Chewing gum Ointments Perfumes Flavoring extracts Resins Adhesives Drugs
Gums
Pulpwood Fuel Charcoal Tannin Dyes Wood alcohol
Cordwood
Sugar and syrup Syrup blend
Sap
Tannin Drugs Oils Dye
Bark
Poles, piles, posts
Veneer Turpentine Charcoal Wood tar Pine oil
Stumps
Lumber Ties Veneer Plywood Pressboard
Logs
Smoking pipes Tea and oil
Roots

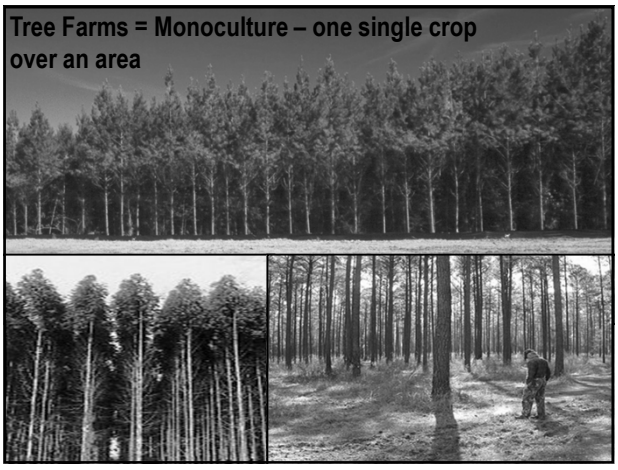

Old-Growth Deforestation in U.S. / Canada
• Most (≈90%) original forest cleared
• Most (≈95%) California old-growth redwoods clear-cut
• Pacific Northwest deforestation:
1 football field cut every 10 minutes
Washington state clear cut
© Brooks/Cole, Cengage Learning

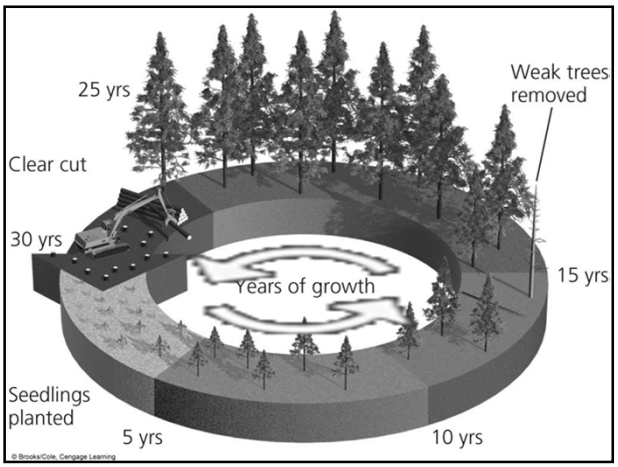


Brazilian Exports of Hardwoods

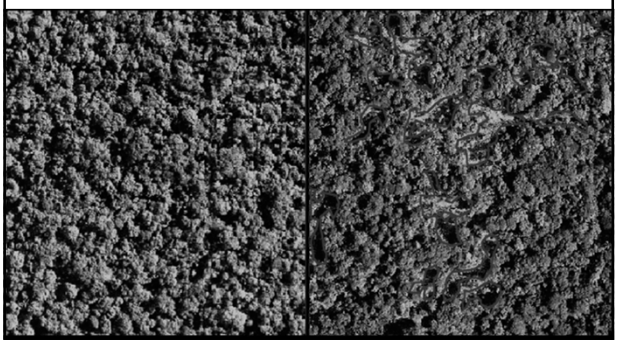
Second growth - Secondary succession forests after cutting
Ex: most US Forests, tree farms,

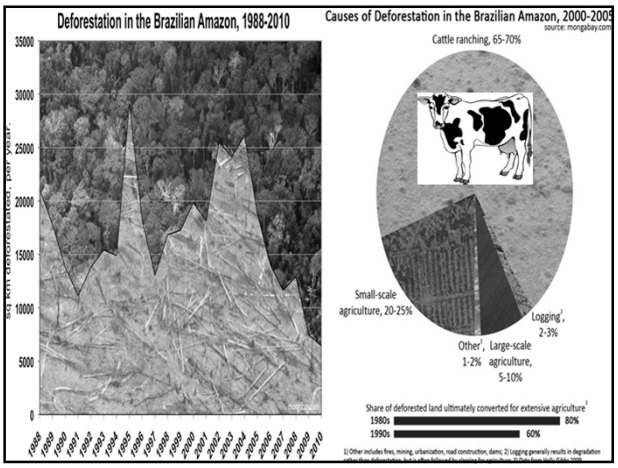
Tree Farms = Monoculture – one single crop over an area

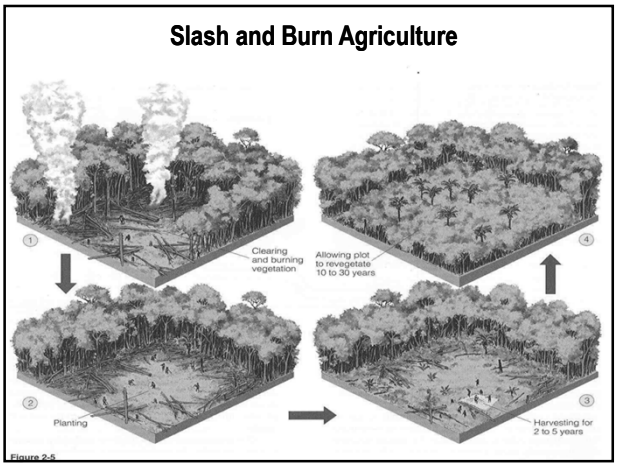


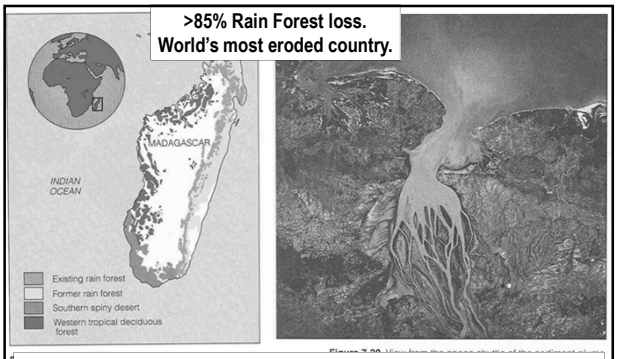


Selective Logging



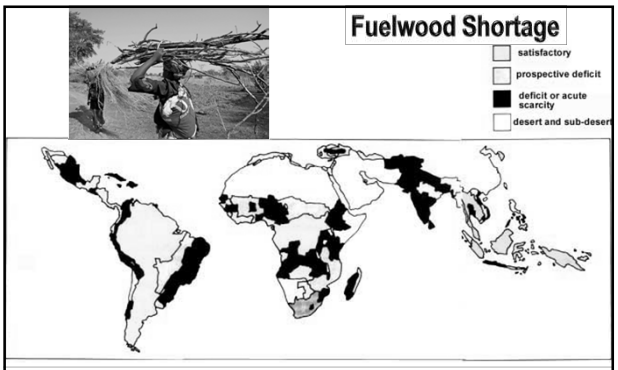

Deforestation in the Brazilian Amazon, 1988-2010
sq km deforestad, per year
35000
30000
25000
20000
15000
10000
5000
0
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Causes of Deforestation in the Brazilian Amazon, 2000-2005
source: mongabay.com
Cattle ranching, 65-70%
Small-scale agriculture, 20-25%
Logging[2], 2-3%
Other[1], Large-scale agriculture, 5-10%
Share of deforested land ultimately converted for extensive agriculture[3]
1980s
80%
1990s
60%


Slash and Burn Agriculture
1
Clearing and burning vegetation
2
Planting
3
Harvesting for 2 to 5 years
4
Allowing plot to revegetate 10 to 30 years
Figure 2-5



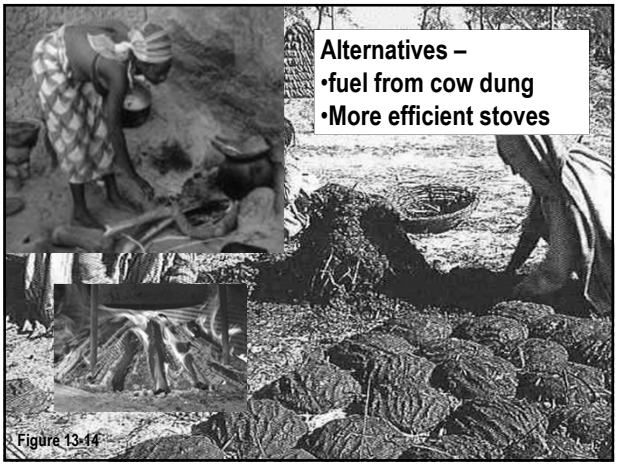
>85% Rain Forest loss.
World's most eroded country.

Causes of Deforestation – shifting cultivation (slash and burn), logging, rapid population growth (people need wood to burn, build, etc..)

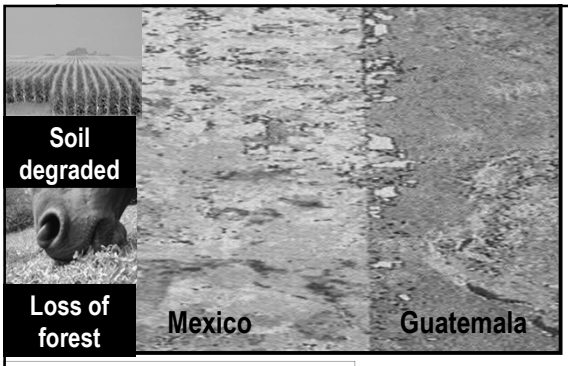


Fuel Wood Crisis – People need wood to burn for cooking. Tree consumption is greater than regrowth. People cannot afford natural gas. So they have to walk further for fuelwood.

- City dwellers burn charcoal because it is lighter and cheaper to transport.
- Charcoal is made by burning wood in pits. Making charcoal consumes more than ½ the woods energy.
- A city dweller burning charcoal uses twice the amount of fuelwood than a rural dweller.

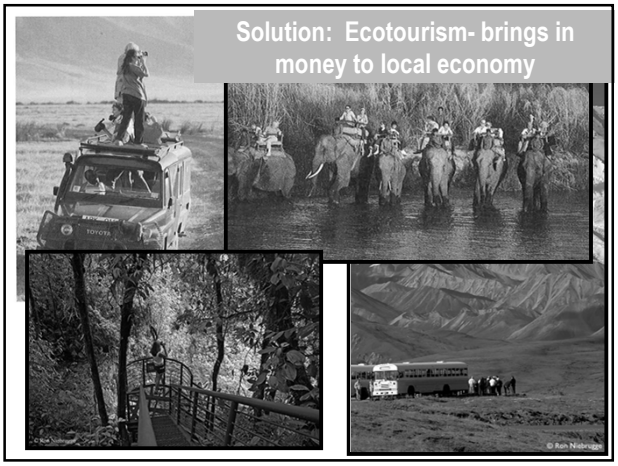


Solutions

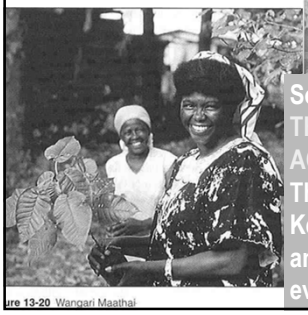


Solution: Discourage use of tropical forest by landless poor.

Cleared areas:
Water:



WANGARI MAATHAI



ure 13-20 Wangari Maathai

Solutions: Individual Action – THINKING GLOBALLY, ACTING LOCALLY

The Greenbelt movement

Kenyan women raise trees and receive a small fee for every tree that survives.

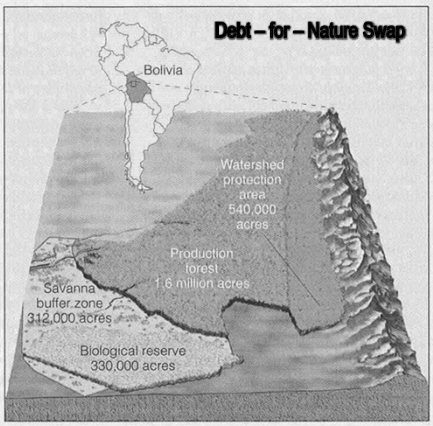
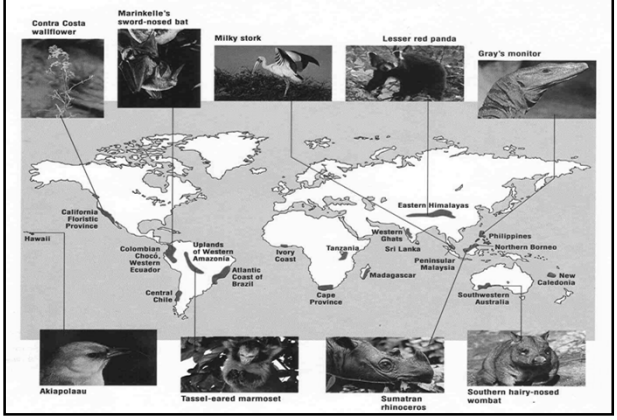


Figure 13-16 Conservation International

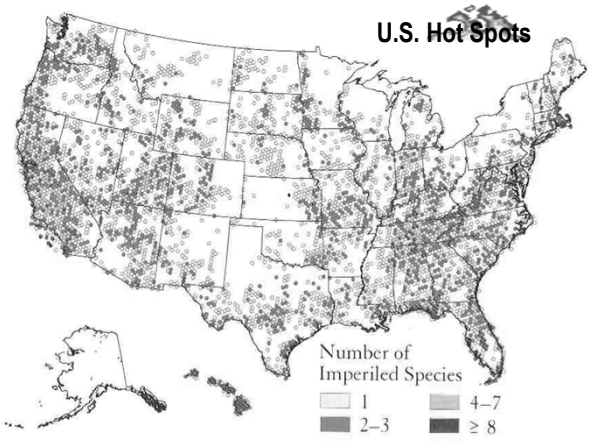
Debt-for-nature Swap:

Foreign debt can be cancelled in exchange for spending money on natural resource management

Solution: Protect "hot spots" of high biodiversity



U.S. Hot Spots



Solution: Extractive Reserves allow Sustainable harvest of renewable non-wood resources
Example: Brazilian rubber tappers – Chico Mendes

Figure 13-8
Chico Mendes murdered in 1988 for trying to protect rubber tree forests.

Chipko movement – nonviolent way to stop logging and deforestation.


today

CHIPKO DELHI

EXCLUSIVE

Nehru Place vows to save its trees from DDA's axe!

DDA wants to take out their lung and replace it with a bazaar. >p.3

Tree Sitting: Julia Butterfly Hill, an activist in Humboldt County, California became known for her 738 day sit (from December 10, 1997 until December 18, 1999) in a 180-foot (55 m), 600-year-old Coast Redwood tree she named *Luna*. Eventually, Hill and other activists raised $50,000 to spare her tree and a 200-foot (61 m) buffer around it.

THINKING GLOBALLY, ACTING LOCALLY

Planting trees, shrubs on street islands –Tree Fresno

Recreation / restoration projects – Eagle Scouts

San Joaquin River Parkway and Conservation Trust – riparian habitat restoration