



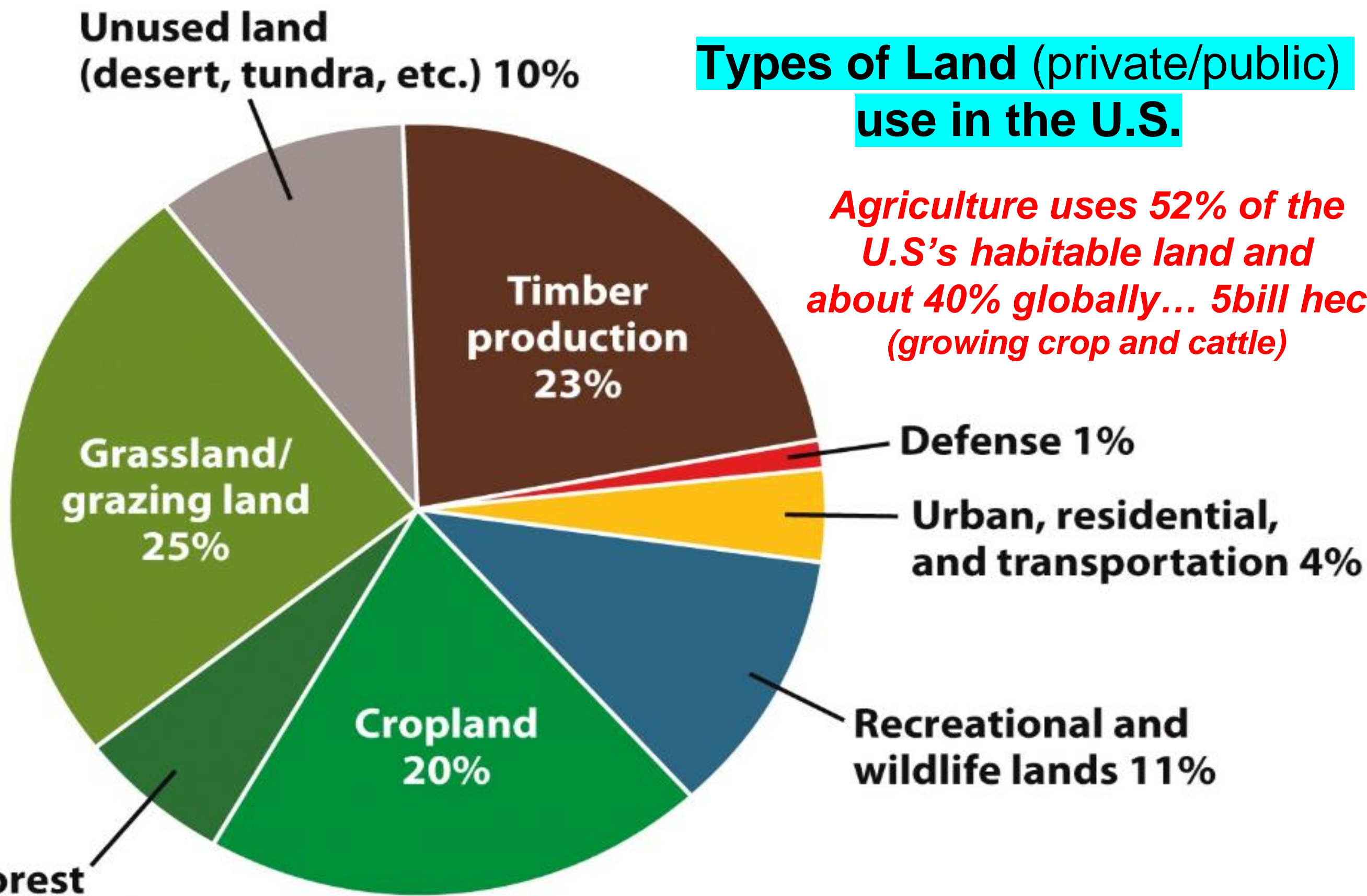
# Chapter 10

## Land, Public and Private



# Types of Land (private/public) use in the U.S.

*Agriculture uses 52% of the U.S.'s habitable land and about 40% globally... 5bill hec (growing crop and cattle)*



**Only ~2% of land is used as urban land (world), the other 98% is used for timber production, land for grazing, crops and recreational**

**Forest grazing land 6%**

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# The Components of U.S. Land Use

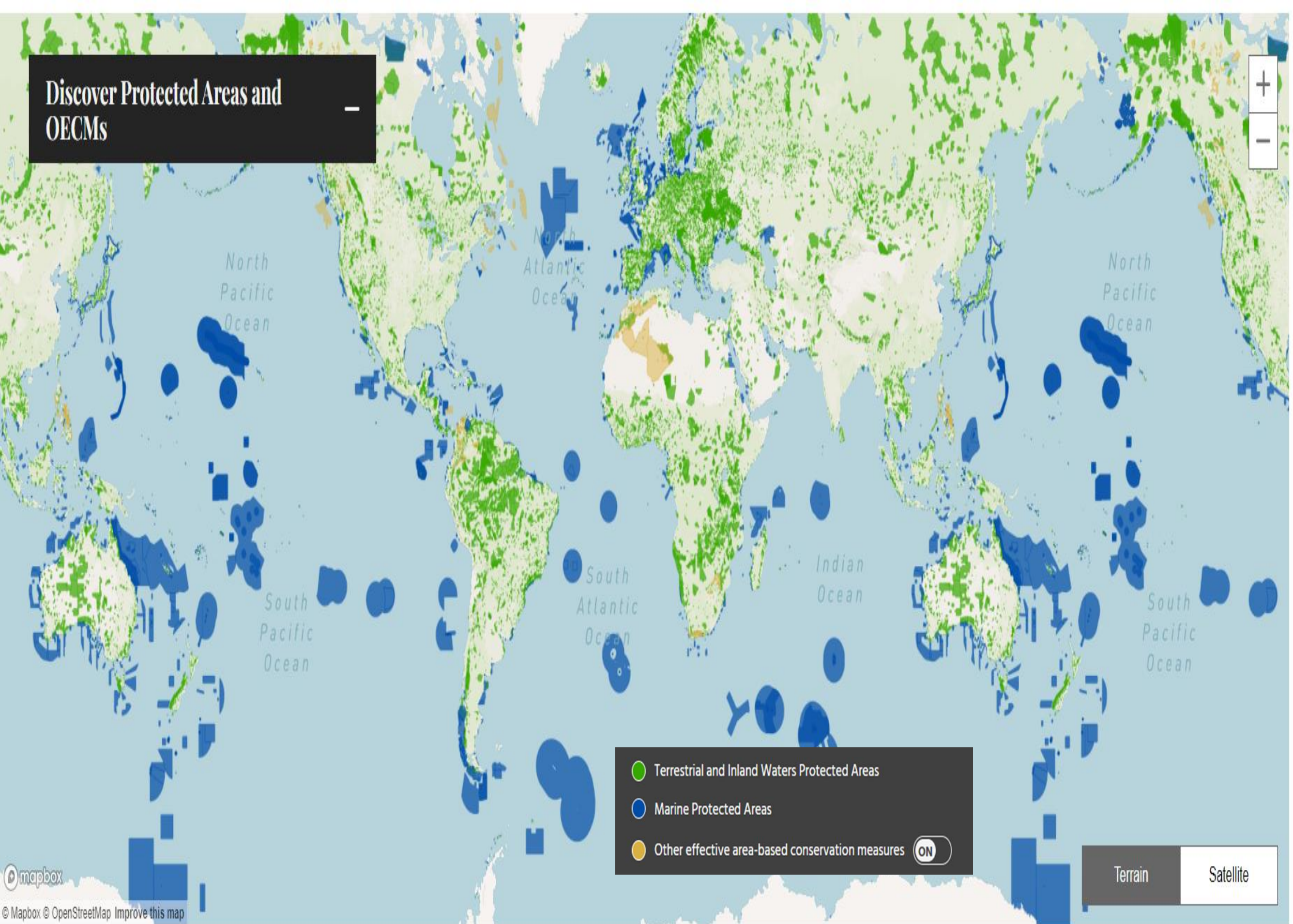
As the U.S. prepares to add **100 million** more people this century, the “2100 Project: An Atlas for the Green New Deal” provides a snapshot of U.S. land use (as of 2017), aimed at managing resources to support this future.

According to this data, here is a snapshot of land use in the Lower 48 States:

Land type	Land use (%)	Land area
Forests	27%	842,400 mi <sup>2</sup>
Shrubland	24%	748,800 mi <sup>2</sup>
Agriculture	17%	530,400 mi <sup>2</sup>
Grasslands and Pasture	17%	530,400 mi <sup>2</sup>
Wetlands	5%	156,000 mi <sup>2</sup>
Other	5%	156,000 mi <sup>2</sup>
Open Space	3%	93,600 mi <sup>2</sup>
Urban Areas	2%	63,400 mi <sup>2</sup>
<b>Total</b>	<b>100%</b>	<b>3,120,000 mi<sup>2</sup></b>

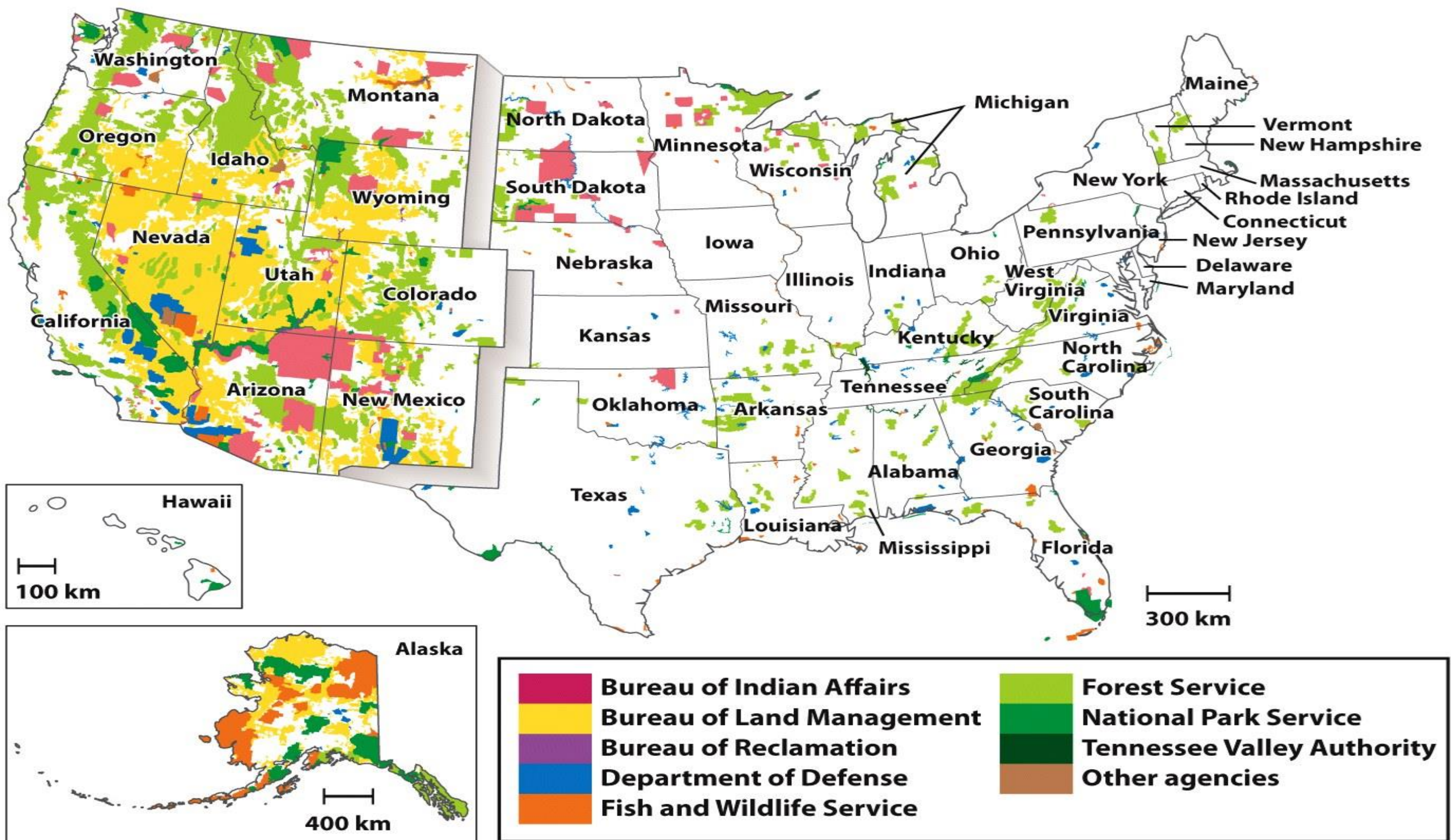


## Discover Protected Areas and OECMs



**Protected land (15.8%) and marine (8.6%) areas of the world**





**In the U.S, 63% of land is privately owned & 29% is Federally (U.S. Forest Service, National Park Service (public land, *developed recreation areas & conservation land*), Fish & Wildlife Services (*wilderness areas*) owned**

- Agriculture, housing, recreation, industry, mining, & waste disposal are all uses of LAND (*food, shelter, & natural resources*) that have benefits to humans....

Human activity...Negative consequences:

1. **Extensive logging**....mudslides
2. **Deforestation (solution??)**....climate change & other environmental problems
3. **Changes to land**...largest cause of species extinctions
4. **Paving over surface land**...reroutes water runoff & absorbs heat from sun, *heat islands*
5. **Overuse of farmland**...soil degradation & water pollution

# The Tragedy of the Commons (*selfishness*)

*In 1968, ecologist Garrett Hardin described the “tragedy of the commons”.*

- **Tragedy of the commons-** the tendency of a **shared, limited resource** to become **depleted** because **people act from self-interest** for short-term gain.



# Managing diff types of public lands

(grassland, forest, dessert, tundra)...**Local, State, & Federal**

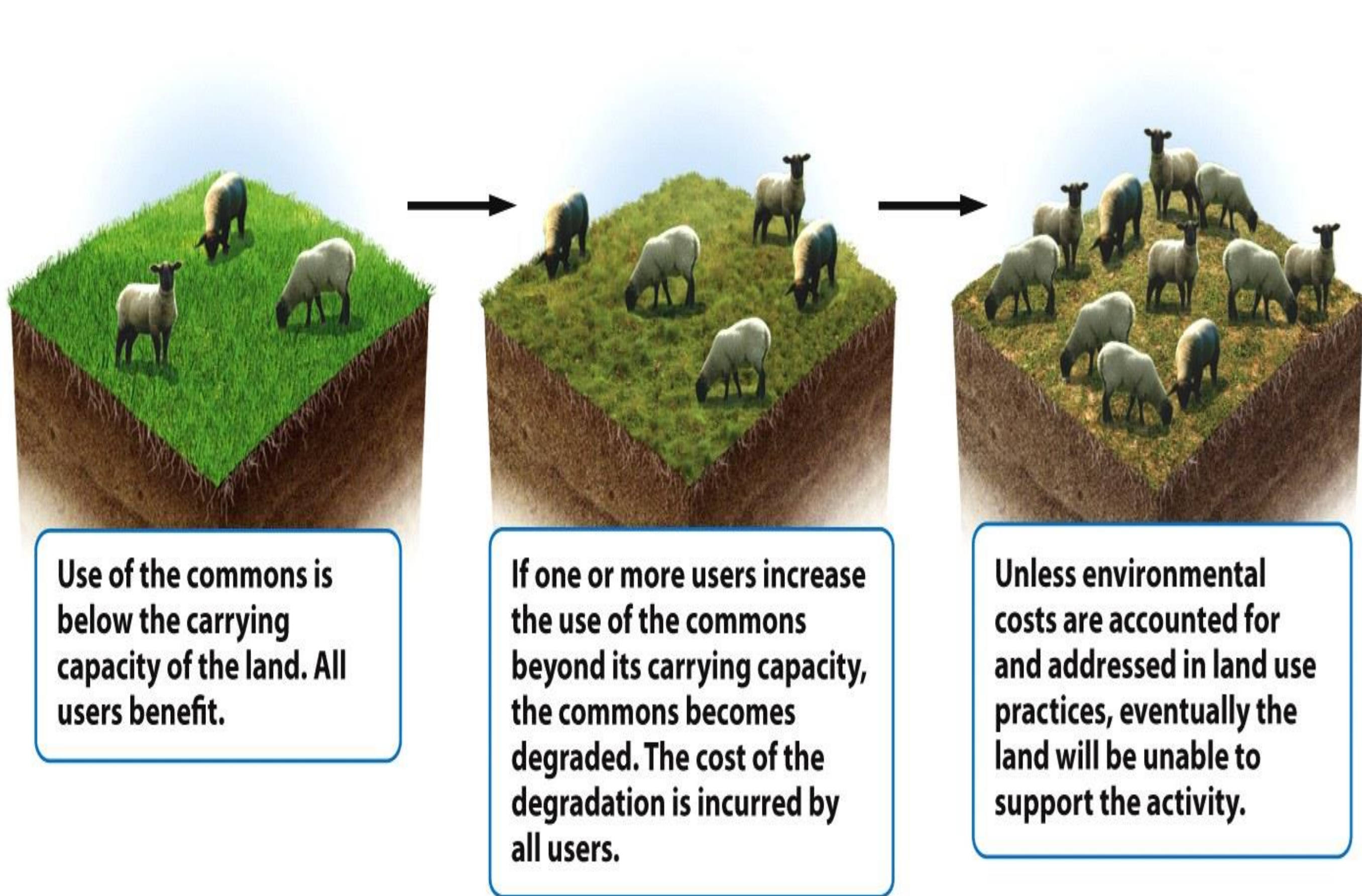
1. Rangelands: Dry, **open grasslands** that are primarily **used for cattle grazing** (most common use in U.S).

**Pro:** use less fossil fuels than raising cattle in feedlots

**Con:** overgrazing due to improper management of cattle can damage stream banks & pollute surface water caused by runoff & wind erosion (loss of vegetation)







**Figure 10.2**  
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## 2. Forests

- Areas **dominated by trees** and other woody vegetation.
- 73% of forests used for commercial timber operations in U.S. are privately owned.

**Two most common ways to harvest trees:**

**1. Clear-cutting**

**2. Selective-cutting**

**3. Ecologically sustainable forestry (not very common)**



# Timber Harvest Practices

**A. Clear-cutting**- removing all, or almost all the trees in an area.

- Easiest, most economical method (make \$\$).
- Foresters often replant or reseed the area, resulting trees will be the same age (works well for fast-growing trees only).
- increase wind & water erosion (especially on slopes)



↓ Regrowth



**(a) Clear-cutting**



Timber Companies will use fire or herbicides to remove vegetation before **clear-cutting resulting in.....**

- **Reduction in soil quality (leading to nutrient loss & reduction in water infiltration)**

- **Contamination of water due to run off into streams/rivers**

- **Habitat alteration**

- **Destruction and forest fragmentation**

- **Decrease biodiversity**

- **Lower aesthetic (visual) value**



## B. Selective cutting-

removing single trees or relatively small numbers of trees from a forest.

-reseed, replant young trees in openings (produces optimum growth only among shade-tolerant tree species)

-negative environmental impacts associated with logging remain the SAME.



↓ Regrowth



**(b) Selective cutting**

**Figure 10.8**

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## C. Ecologically sustainable forestry

Goal of maintaining all species, both plant and animals, in as close to a natural state as possible.

Logging without the use of fossil fuels (use of horses to pull trees out), further enhances the sustainability (reduce soil compaction)

Difficult to compete economically with mechanized logging practices.



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# Fire Management

- Prescribed burns- a fire is deliberately set under **controlled** conditions (reducing the accumulation of dead biomass, prevention of uncontrollable fires).
- *Purpose:* **nutrient cycling, regeneration & early-successional species.**



Figure 10.11a  
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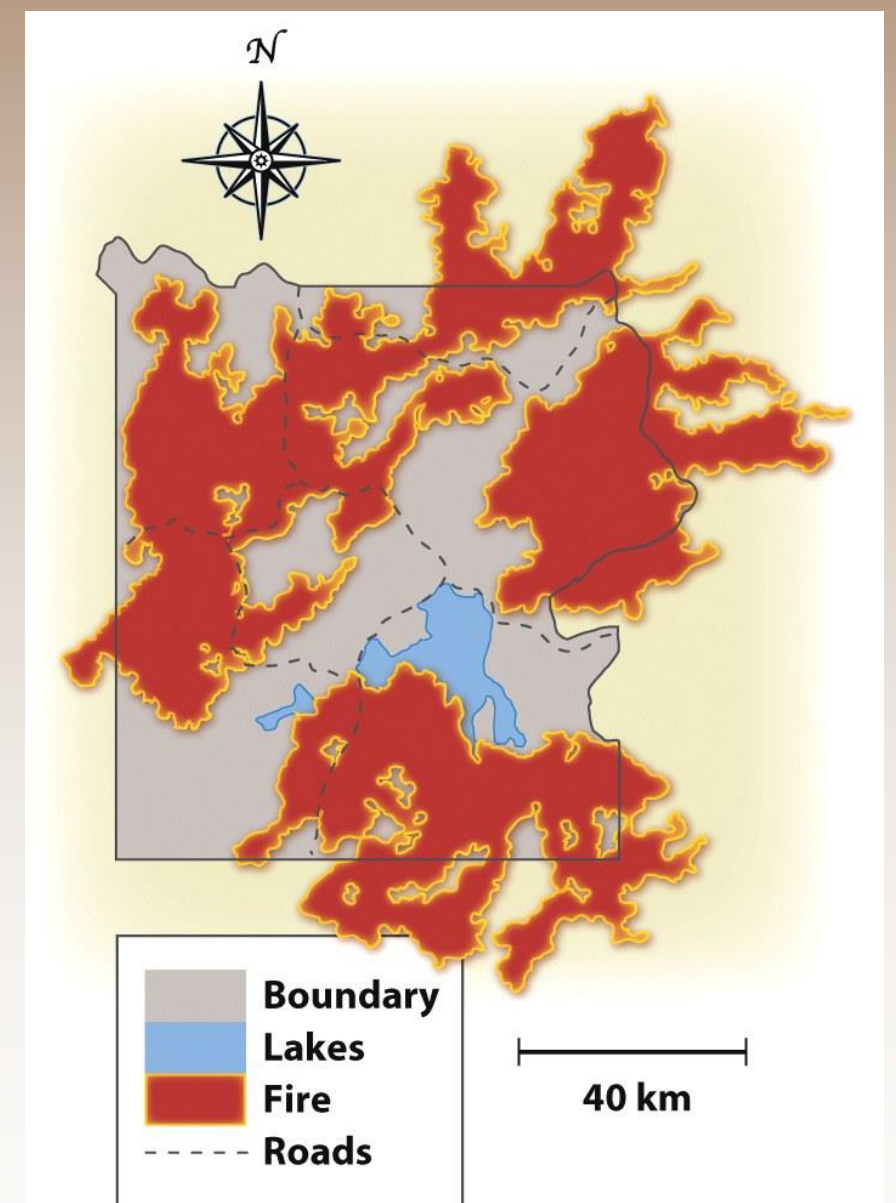


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# Forests

**3. National Parks-** established to *preserve scenic views and unusual landforms* (ex. Yellowstone).

- **Human activities** (*ex. driving ATVs, camping causes air & noise pollution and habitat destruction*)

**4. National wildlife refuges-** (federal public land) for the purpose of *protecting wildlife*

**5. National wilderness areas-** set aside to *preserve large tracts of intact ecosystems or landscapes.*

- **Limited human use, roadless, but mining is permitted.**

# Industrial, Commercial & Residential Land

(types of land for sale)

- **Suburban**- areas **surrounding** metropolitan (city) centers with low population densities compared to urban areas (*outskirts of city*).
- **Exurban**- similar to suburban areas but are **not connected** to any central city or densely populated area.



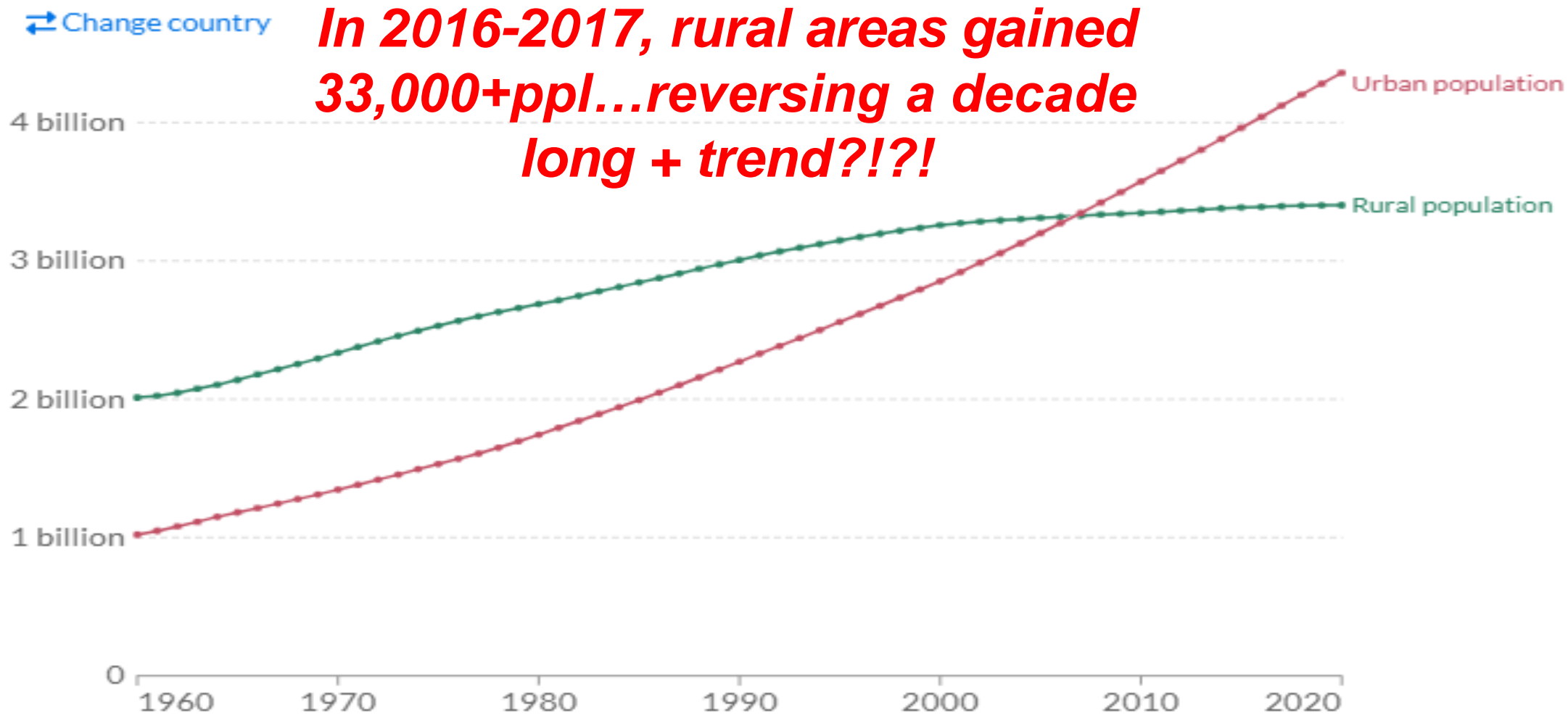
*Rural vs. Suburban vs. Urban*

**Rural** areas **cover 97% of the national's land**, but only contain **19.3% of the population**. **Urban** makes up **3%** of the land and is **home for more than 80%**



# Number of people living in urban and rural areas, World

Our World  
in Data



Source: World Bank based on data from the UN Population Division

OurWorldInData.org/urbanization • CC BY

Note: Urban populations are defined based on the definition of urban areas by national statistical offices.

▶ 1960  
CH

Today, **56%** of the world's population – 4.4 billion inhabitants – live in cities. This trend is expected to continue, with the urban population more than doubling its current size by 2050, at which point nearly 7 of 10 people will live in cities.

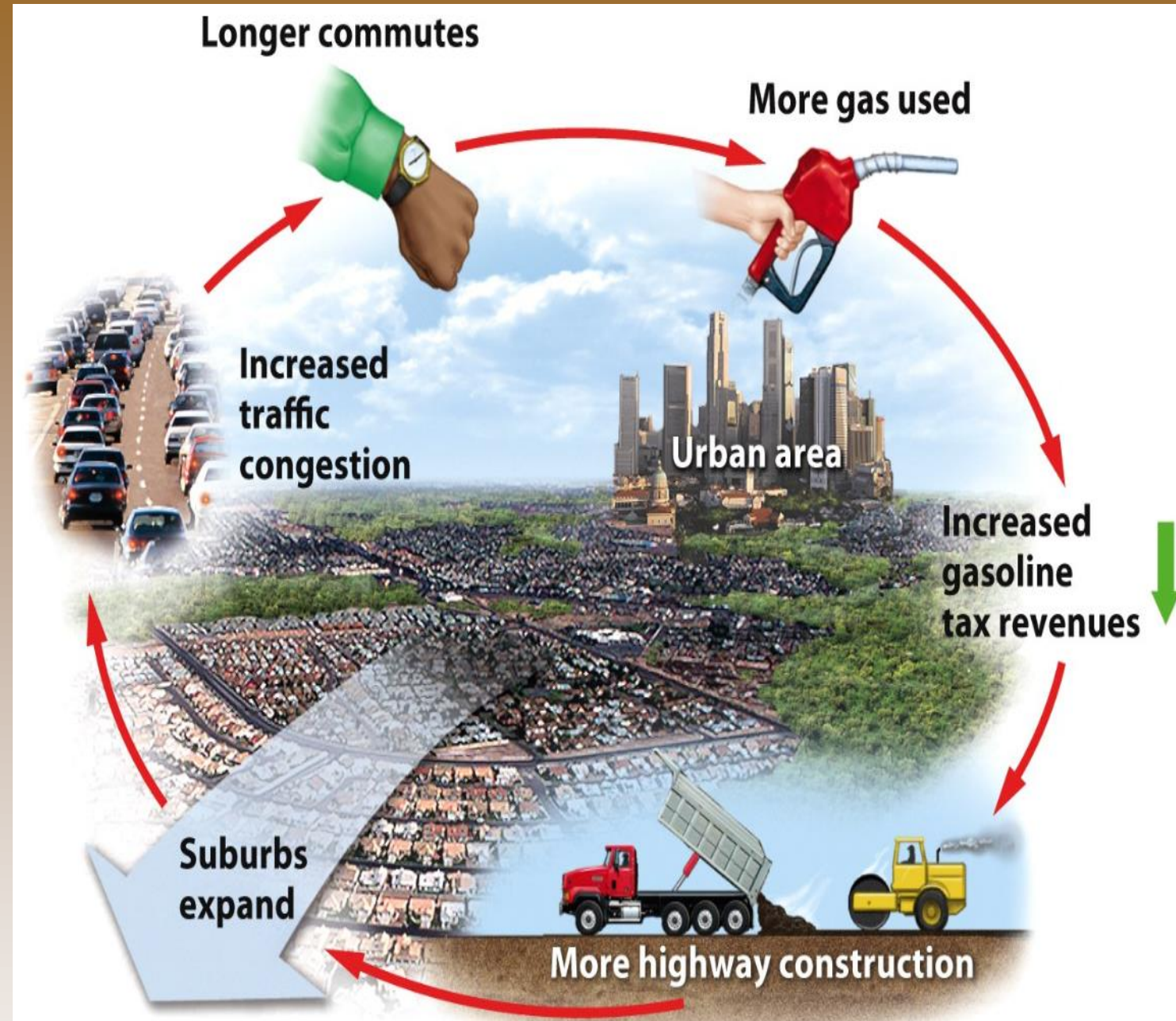
Since 1950s, more than **90%** of the population growth has occurred in the suburban. Shift from *rural to suburban*, lead to *urban sprawl*

# Urban Sprawl

- **Urban sprawl**- the creation of urbanized areas that **spread into rural areas**.

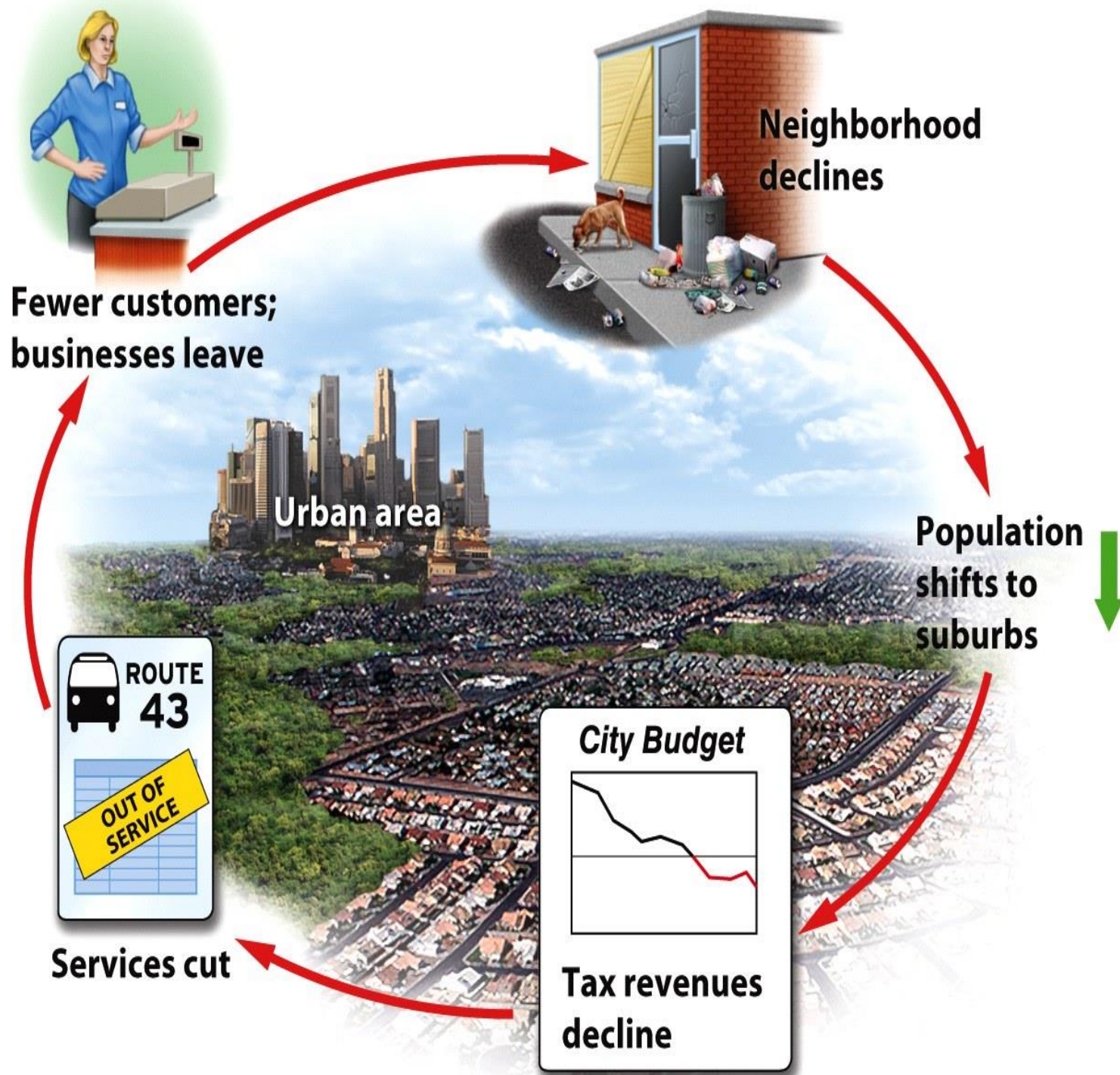
## Main concerns of urban sprawl in the U.S:

1. automobiles and highway **construction**
2. **living costs** (*people can get more land and a larger house in the suburbs for the same amount of money*)



The use of gasoline tax money to build highways leads to development of suburbs and traffic congestions... leading to spending MORE money on highways to alleviate the congestion.





**urban blight** (*city revenue shrinks as people move to the suburbs*)

-contributed to racial segregation. “white flight” resulted highly concentrated minority populations in city and Caucasians to the suburbs, higher property tax often allowed for better schools. (see cycle, wealth...)

As people move away from a city to suburbs and exurbs, the city often deteriorates, causing more people to leave, that can afford it.

\*(positive feedback loop).

**Smart Growth** – focuses on **strategies** that encourage the **development of sustainable, healthy communities**  
(ex. Residential on top of businesses)

## EPA's 10 basic principles of smart growth....

- 1. Mixed land uses** (residential, retail, education, businesses, recreation all in same area, strip)
- 2. Create a range of housing opportunities and choices** (all income levels)
- 3. Create walkable neighborhoods** (reduce traffic, fossil fuels, health benefits)
- 4. Encourage community and stakeholder collaboration in development decisions** (how neighborhoods will appear and be structure)
- 5. Take advantage of compact building design** (incorporate multistory building (building up vs. out) & parking garages...an apartment above a store).



- 6. Foster distinctive, attractive communities with a strong sense of place** (an area has a distinct & meaningful character, adds to the quality of life)
- 7. Preserve open space, farmland, natural beauty and critical environmental areas** (habitats for other species)
- 8. Provide a variety of transportation choices** (rail systems, biking racks, bus services, reduce need for private cars)
- 9. Strengthen & direct development toward existing communities** (development in vacant lots - *infills*, helps prevent urban blight and protects rural land from sprawling)

10. Make development decisions predictable, fair, & cost effective (all suburban developments w/in a region often look the same to allow developers to move through the permitting process quickly)



**Figure 10.18**

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# **Smart growth can have important environmental benefits, compact development can potentially..**

- ~reduce impermeable surfaces
- ~reduce runoff and flooding downstream
- ~reduce water pollution
- ~reduce fossil fuels, reduce miles driven