

Unit 5: Land and Water Use

Review

5.1 Tragedy of the Commons

- One way to regulate a commons is to divide the resources into parcels and assign them to individuals.
- “Resources” includes both living and nonliving things. For example, fish are considered a resource. So is oil.
- Extractive industries remove as much of the resource as possible, as cheaply as possible, to make as much profit as possible.

5.2 Clearcutting

- All of the trees in a forest are cut down and removed.
- Least sustainably, this is sometimes done in one operation.
- Clearcutting increases the evaporation of water from the soil.
- Clearcutting causes more carbon dioxide to be added to the atmosphere, further increasing anthropogenic climate change.

5.3 The Green Revolution

- It is a common assumption that current agricultural practices and strategies need to be evaluated in order to meet demand for increased food production.
- This will, in many cases, lead to more funding for agricultural research programs which have never been completely supported financially.
- This perspective leads us to believe that the only way to meet global demand for more food is to utilize new science technologies to advance agriculture.

5.4 Impacts of Agricultural Practices

- One advantage of synthetic fertilizer over manure is that it can provide more targeted macronutrients to the crops.
- When mature, forested land is cleared and converted to cattle grazing land, this leads to a reduction in the uptake of atmospheric carbon dioxide.
- Tilling soil and fertilizing it leads to cultural eutrophication.

5.5 Irrigation Methods

- Drip irrigation works best in arid lands with shallow, sandy soil.

5.6 Pest Control Methods

No questions from this topic appear on this unit exam.

5.7 Meat Production Methods

- Data suggests that raising beef cattle contributes more to greenhouse gases than raising chickens. This is primarily because fermentation in cows' digestive tracts, which releases methane gas.
- On grass-fed pasture, composted manure is used onsite as fertilizer, animals are rarely housed in a stable, and only sick animals receive antibiotics.
- On a concentrated animal feeding operation, manure is stored in lagoons until liquefied, then sprayed onto crops. Animals here are stabled approximately 45 days each year, and animals are routinely given antibiotics to prevent the spread of disease.
- As countries move through the demographic transition and become more developed, global meat consumption should increase.

5.8 Impacts of Overfishing

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) uses trade rules to protect commercially valuable species.
- One way to help prevent a decrease in the number of fish species experiencing population decline is to only eat fish that are harvested sustainably, which will keep populations stable and reduce bycatch.
- The federal government can accomplish the same thing by imposing catch limits and taxes on any extra fish harvested.

5.9 Impacts of Mining

No questions from this topic appear on this unit exam.

5.10 Impacts of Urbanization

- One advantage of urbanization is that individuals living in cities usually have a lower transportation carbon footprint than those living in rural areas.
- Using new, more permeable materials for roads and sidewalks would help decrease flood frequencies and sizes.
- Increased amounts of waste per unit area in urban areas leads to higher rates of decay and decomposition, which in turn increases the amount of carbon dioxide released into the atmosphere.

5.11 Ecological Footprints

- Reducing the amount of meat in your diet, including becoming vegetarian or vegan, or participating in “Meatless Monday,” can reduce your ecological footprint.
- Consuming fewer products and services can reduce your ecological footprint.

5.12 Introduction to Sustainability

- Green roofs reduce levels of pollutants because the vegetation absorbs the pollutant.
- Understand calculations of rate (volume/time; volume/volume) and how to use it to calculate total.
- Nitrates are nutrients that get into bodies of water through runoff. Green roofs would likely improve this parameter of water quality.

5.13 Methods to Reduce Urban Runoff

- Infiltration can be measured as distance water travels into soil.
- Know “independent” and “dependent” variables.

5.14 Integrated Pest Management

- Reduces or eliminates the amount of chemicals used on crops.
- Disrupts pest habitat (food, water, and shelter) leading to a reduced number of pests in an area.
- Using genetically modified crops may reduce the pest population more per unit cost.

5.15 Sustainable Agriculture

No questions from this topic appear on this unit exam.

5.16 Aquaculture

- One direct economic advantage of aquaculture is that it produces large amounts of seafood for human consumption year-round.
- Aquaculture contaminates surrounding water with organic waste.
- Farmed fish can escape and outcompete wild fish for food and territory.

5.17 Sustainable Forestry

No questions from this topic appear on this unit exam.