

CHAPTER 12: FOOD, SOIL, AND PEST MANAGEMENT

12-1 What is Food Security and Why is it Difficult to Obtain?

- Health Problems From Not Getting Enough to Eat

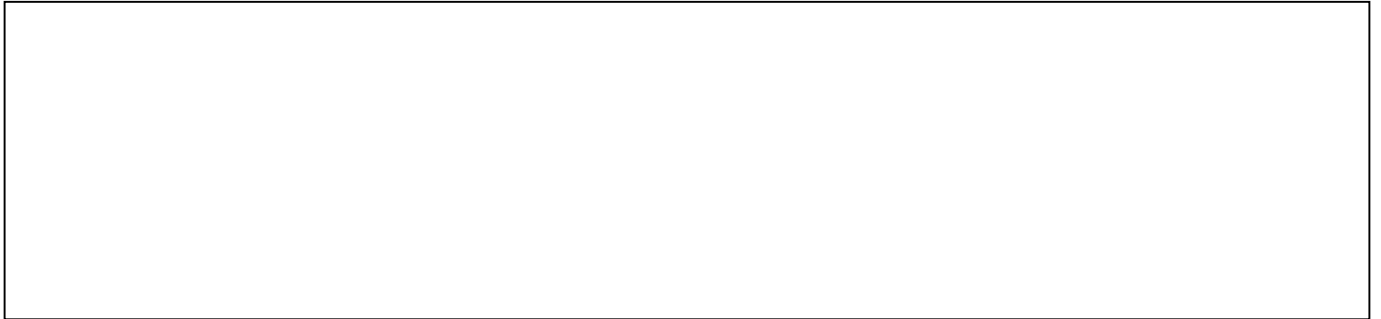
- Chronic Hunger and Malnutrition

- Not Enough Vitamins and Minerals


- Health Problems From Eating Too Much

12-2 How Food is Produced

- Production Has Increased Dramatically




- Industrialized Crop Production Relies on High-Input Monocultures



- Hydroponics: Growing Crops Without Soil



- Traditional Agriculture Relies on Low-Input Polycultures



● Industrialized Crop Production

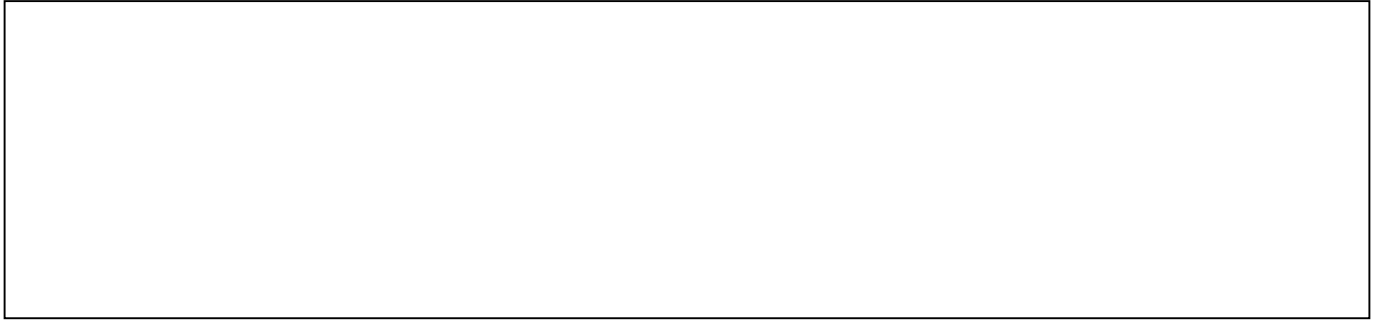


Diagram: (Soil Horizons)

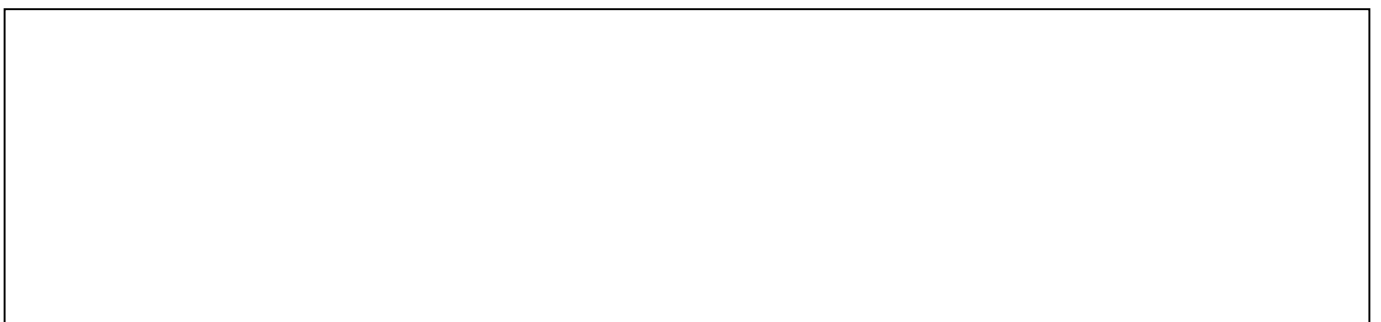
● First Green Revolution (Industrialized Food Production in the US)



● Crossbreeding and Genetic Engineering



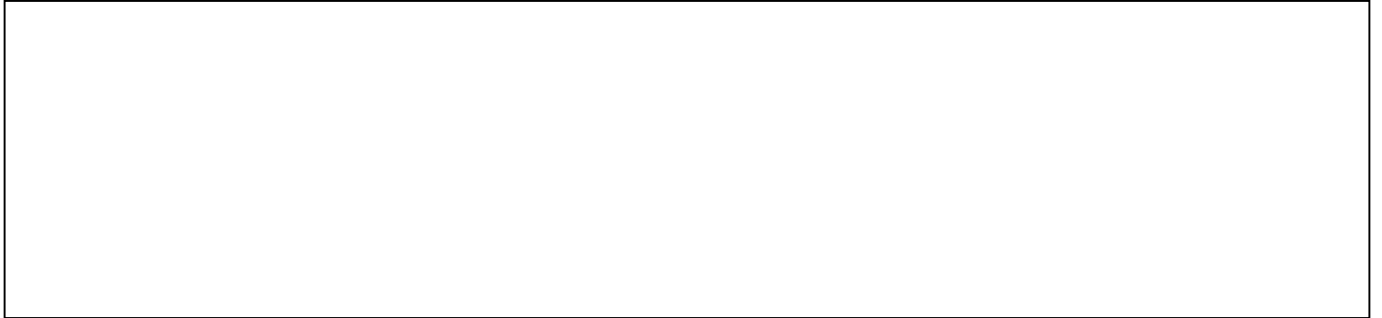
● Meat Production



● Fish and Shellfish Production



● Industrialized Food Production = High Energy Input



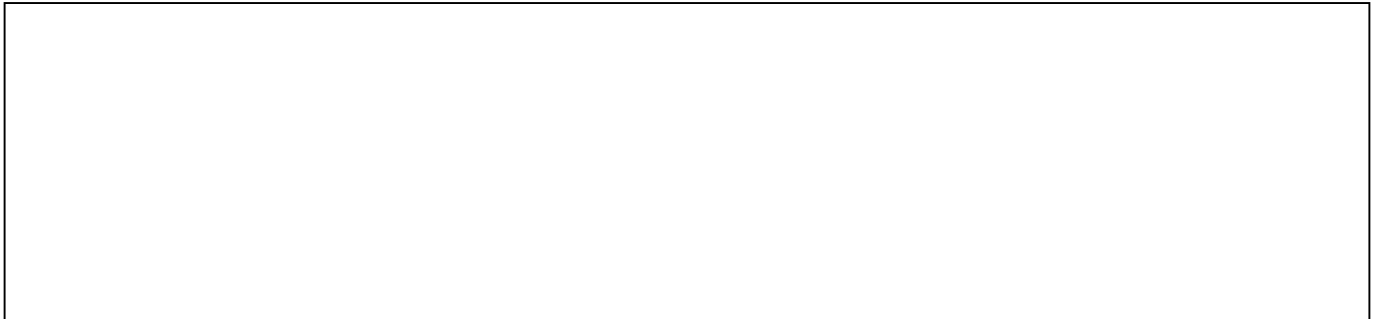
12-3 Environmental Problems Due to Industrialized Food Production

● Major Environmental Impacts



Diagram:

● Topsoil Erosion



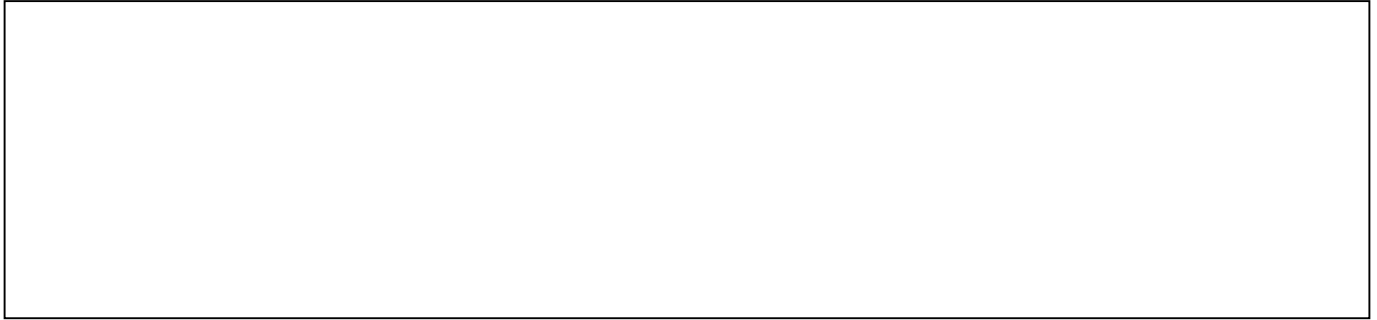
● Drought and Human Activities Degrading Drylands



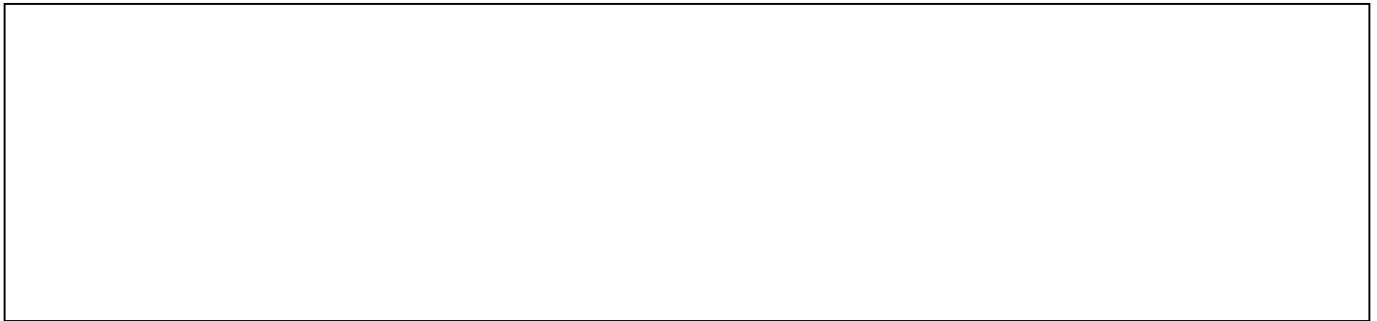
● Excessive Use of Irrigation



● Agriculture Contributes to Air Pollution & Projected Climate Change



● Food & Biofuel Production = Major Losses of Biodiversity



● Genetic Engineering



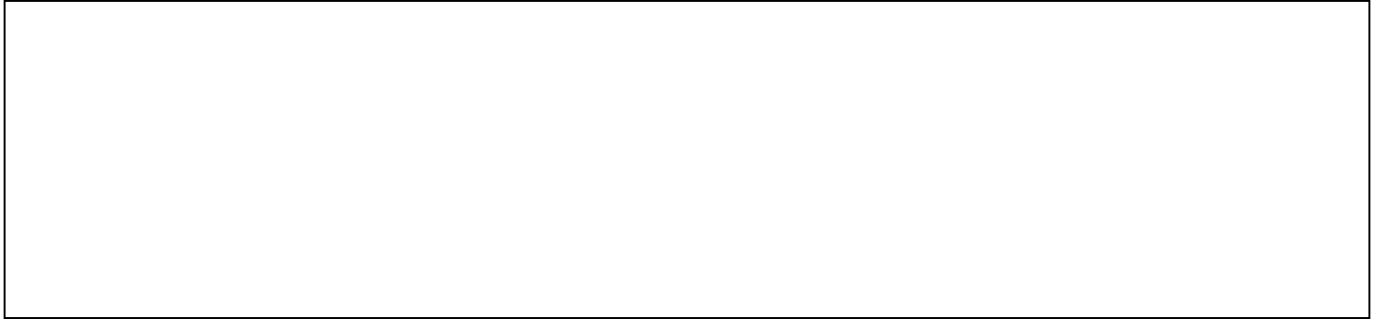
● Limits to Expansion



● Industrialized Meat Production – Environmental Consequences



● Aquaculture can Harm Aquatic Ecosystems



12-4 How to Protect Crops From Pests More Sustainably

- Nature Controls Most Pest Populations

- Pesticides Help Control Pest Populations

- Modern Synthetic Pesticides - Advantages

- Modern Synthetic Pesticides - Disadvantages

- Pesticide Use Has Not Reduced Crop Losses

● Ecological Surprises: The Law of Unintended Consequences

● Laws and Treaties

● Alternatives to Conventional Pesticides

● Integrated Pest Management

12-5 How to Improve Food Security

- Government Subsidies Can Help or Hinder

- Other Government and Private Programs

12-6 How To Produce Food More Sustainably

- Reduce Soil erosion

- Soil Erosion in the US

- Restore Soil Fertility

- Reduce Soil Salinization and Desertification

- Practice More Sustainable Aquaculture

- Raising Salmon in an Artificial Ecosystem

- Produce Meat More Efficiently, Eat Less Meat

- Shift to More Sustainable Food Production

Diagrams:

- Buy Locally, Grow Locally, Cut Waste