Lecture summary Jan 25, 2012.

Environmental science FFY471, Env physics FYP350

Chap 5 and chap 12.

Chap 5 on primarily Population size and Population growth. The sections 5-1, 5-2 and 5-4 can be read rapidly. 5-3 on "What limits the growth of population" is the important one.

(Concerning all the "Case studies" in the book. They are interesting to read, but there will no questions on the exam from the case studies.)

Concepts in chap 5 of particular importance

Population characteristics - distribution (in area and volume)

- numbers
- age structure
- density

Population size governed by

- births (+) - deaths (-)
- immigration (+)
- emigration (-)

Population growth

Biotic potential; the capacity for population growth under ideal conditions. Intrinsic rate of increase(r); the rate the population would grow if unlimited resources

Limiting factors to growth: light, water, space, nutrients, competitors, predators, diseases.

Environmental resistance; all factors that limit the growth of a population.

The carrying capacity is determined by the biotic potential and the environmental resistance and defined as the maximum population of a habitat that can be sustained indefinitely.

Growth types

-Logistic growth with an exponential rise and the fluctuations toward the carrying capacity. Gives an S-curve.

-Overshoot population. Doesn't brake fast enough at the carrying capacity.

Check on the reproduction pattern with r- and K-selected species.

Chap 12. Food

Sections 12-5 on "How can we improve food security" and sec 12-6 on "How can we produce food more sustainable" could be read rapidly.

Section 1. The hunger situation in the world.

Food security: daily access to enough nutritious food to have a healthy life.

What do human needs:

macronutrients (carbohydrates, proteins, fats) micronutrients(vitamins, minerals) Deficiencies cause problems.

Section 2. Food production

Three major "systems" for food supply: croplands 77% of the world food. using 18% of the land area. rangelands, pastures, 16% of world food. Using 29% of the land area. feedlots oceanic fisheries, aquaculture 7% of the world food

14 plants (of 50 000 to eat) supply 90% of the world food calories.3 of those plants give 47 % of the calories consumed and 42 % of the proteins.

The big three plants are rice, wheat and corn.

Production methods Industrialized agriculture Traditional agriculture

Industrialized crop production

88% of the increase in the global food production from 1950 is due to the green revolution.

Three steps in the green revolution

1) Develop and plant monocultures of high yield varieties of key crops

2) Use large inputs of fertilizers, pesticides and water

3) Multiple cropping

There was a second generation green revolution at about 1967 connected to dwarf varieties of rice and wheat.

Of great importance for the increased yield is crossbreeding and genetic engineering.

Fish and shellfish production an aquacultures has increased dramatically during later years.

Study the section on pesticides thouroughly.