

# ENV 200

Reminder again: do read chapter 1

(you are responsible for it all  
and for the extra material that we discuss in class)

# Course evaluation

- exam 1: chapters 1 and 2: 20%
- exam 2: chapters 3, 4, and 5: 20%
- final exam: inclusive, & chapters 6 and 7: 33%
- remaining 27%:
  - 4 short assignments: 10%
  - Your topic (research or project) 17%
- extra credit options available

# Green Resistance (teaching, organizing, and eco-thinking)

discussion on struggles for change and connections between the environment, economy, and politics by Rania Masri



[About](#) [ENV 200](#) [MEST 317X: Exploring Environmental \(In\)Justice](#) [my library](#) [my writings and talks](#)


[Political Ecology and Social Change](#)

☰ [Collective memory of residents](#)

Posted by: [r.m.](#) | March 2, 2017 (edit)

CATEGORIES

Select Category

 [ELECTRONIC INTIFADA](#)

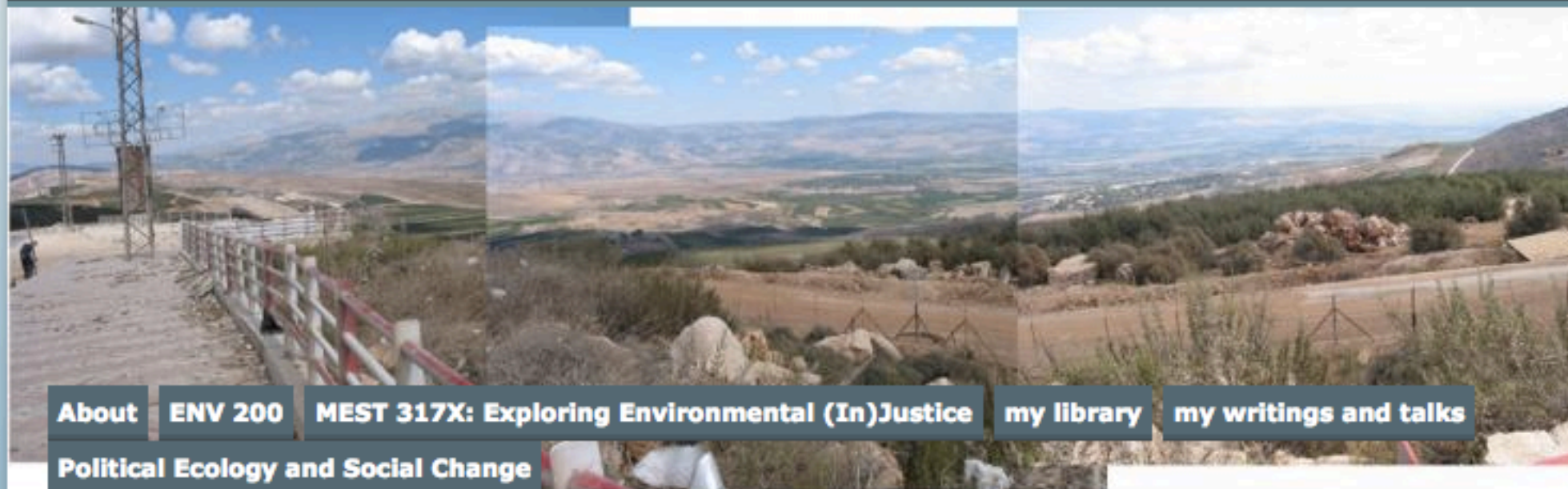
- Why did UN participate in Israeli conference with Nazi sympathizer?
- Israel's expulsion of Jerusalem lawmakers overturned for now
- EU refuses to condemn Israeli genocide plan

Beirut: "In the absence of an agreed network of streets, there are no addresses; and without addresses, says Ghubril, "the Lebanese GPS relies on the collective memory of the residents." One long road in the cosmopolitan Hamra district is formally designated Baalbek Street, but colloquially known as Commodore Street after a cinema that was demolished decades ago. A chaotic transport hub in the south of the city, where rickety old minibuses fill up with passengers before careening wildly across the country, is known simply as Cola, after a long-vanished Coca-Cola factory. Ghubril calls these sites "phantom landmarks."

What this writer describes as "phantom landmarks" in Beirut, I see as the collective resistance and identity of the residents of Beirut. No, we won't say that we will meet at

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☰ ENV 200

Hello students of ENV 200 – Living in the Environment.

You can find slides of the class here, as well as additional class info.

- [Chapter 1A chapter 1A slides](#)

CATEGORIES

Select Category

📡 ELECTRONIC INTIFADA

- [Why did UN participate in Israeli conference with Nazi sympathizer?](#)

# Environmental Topic(s) of interest

Email me (or I shall decide for you)  
[rania.z.masri@gmail.com](mailto:rania.z.masri@gmail.com)



زياد الرحباني



مانيفستو



انسي  
الحاج

خواتم 3

(٢٠١٤-١٩٣٧)

ملحق القروض  
المصرفية



ملحق المصرفية  
الإلكترونية

صفحات PDF

صفحة رئيسية

سياسة

سوريا

اليمن

مجتمع واقتصاد

أعمال

مناطق

تعليم

صحة

علوم

تكنولوجيا

بيئة

ثقافة وناس

ادب وفتون

نجوم

ميديا

كلمات

بيئة

## على الحافة | موسم العيوب

حبيب معلوف

"فتح موسم الصيد" (اليوم) اعتداء وتناول على حقوق الغير. كيف نسمح لأنفسنا أن نتحدث عن "موسم" الصيد البري لأجمل مخلوقات الأرض كالطيور، كما نتحدث عن موسم العنب والتفاح؟! فهل نحن زرعنا وتعبننا في تربية الطيور البرية حتى يأتي يوم نجني ثمار ما زرعنا؟! من الذي ابتدع هذه المفاهيم المتعالية والمضللة، مثل الصيد ومواسمه، المفردة في استغلالها للكائنات الحية؟

العدد ٢٢٧٥

## العجز عن منع «قتل» الطيور لا يبرر تنظيمه!

رياض صادق





green area  
greenarea.me

Manchette Main Report News Expert Opinion Green Press Climate Change Multimedia



### International team witness massacre of protected #birds in #Lebanon

September 7, 2017 |

Over the last two days the international team of 'Bird Guards' (1) from the Committee Against Bird Slaughter (CABS) and Society for the Protection of Nature in Lebanon (SPNL) witnessed...



### Fire at Dutch refinery reveals Europe's dependence on imported diesel

September 3, 2017 |

Europe is known to be dependent on imported crude oil. But an incident at the EU's biggest refinery this summer has shown that the European continent has also become dependent on import of



### Monaco-backed circumnavigating study will report on the health of our oceans

September 3, 2017 |

A ground-breaking new scientific study, will examine the impact of climate change and other environmental factors on the world's marine ecosystem. The 2017-20

# Reminder of discussion

- First and second laws of thermodynamics
- Environmental science: interdisciplinary
- Sustainability ...



# Sustainability

- Earth: 3.5 billion years old; Humans: 200,000 years
- Main issues: solar energy; biodiversity; chemical cycling
  - sun: photosynthesis; and its consequences: indirectly influences wind and flowing water
  - biodiversity: from ecosystems [deserts, grasslands, forests, oceans] to plants and insects and animals
  - chemical cycling: nutrient cycling: circulation of chemicals - from soil and water - through organisms; no waste in nature

## لبنان مهدد بالإجهاد المائي الخطير

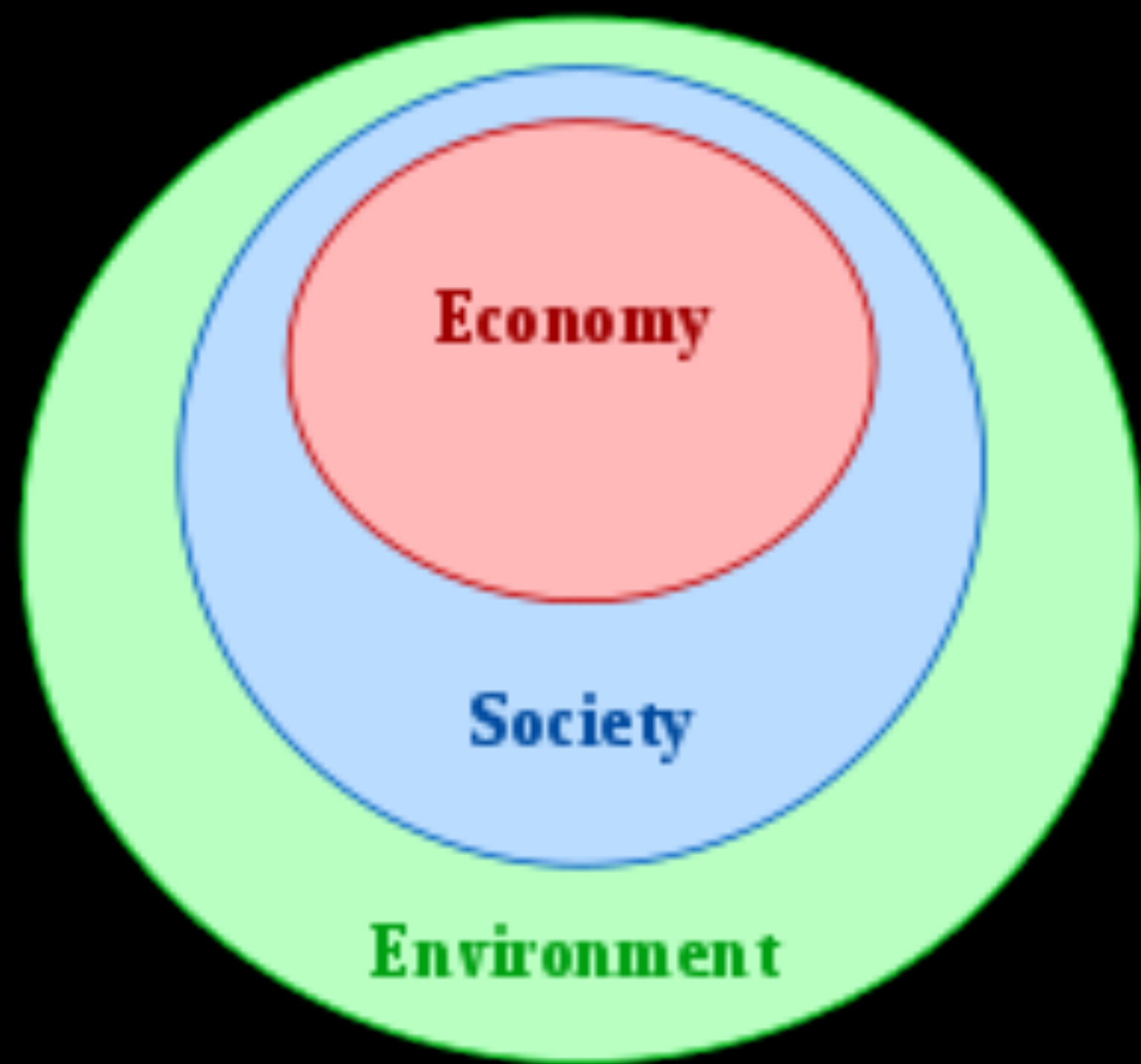
ارتفاع الحرارة درجتين يخفّض الغطاء الثلجي بنسبة 40%



بغدر عدد الآبار غير القانونية بنحو 59 ألف بئر، ما يعادل 6 آبار غير قانونية لكل كيلومتر مربع (هينم الموسوي)

لبنان مهدد بخسارة ثروته الأهم: المياه! هذا التوقع الخطر قد يتحوّل واقعاً محتوماً، في حال استمرار التفريط بهذا المورد الحيوي والأساسي للحياة. بحسب مركز البحوث في «بلوم بنك» إن سوء إدارة قطاع المياه في لبنان، وتآثر هذا القطاع بعوامل كثيرة أبرزها تغيّر المناخ والتلوّث وعشوائية الاستثمار، قد تدفع باتجاه معاناة لبنان من إجهاد مائي خطير، ينعكس حكماً على نوعية الحياة فيه!



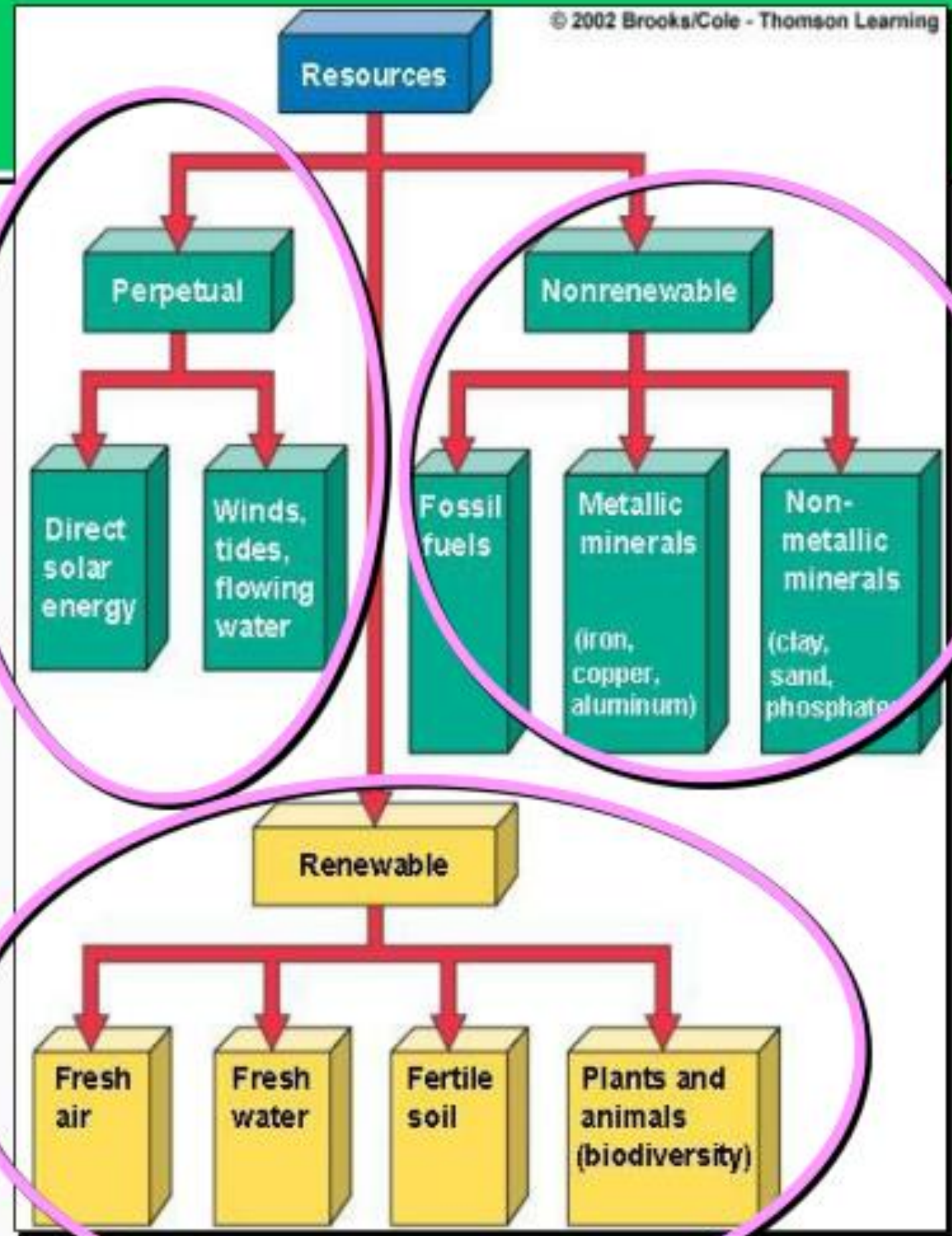




# Sustainability

- **natural capital = natural resources** (renewable and nonrenewable) **+ natural services** (processes in nature such as purification of air and water, renewal of topsoil)
  - *what is the difference between your capital and your income?*
- solar energy: perpetual resource
- *know the difference between renewable and nonrenewable resource, and how a renewable resource can become non-renewable*

# Resources



➤ **Perpetual**

➤ **Renewable**

➤ **Non-renewable**

# Sustainability

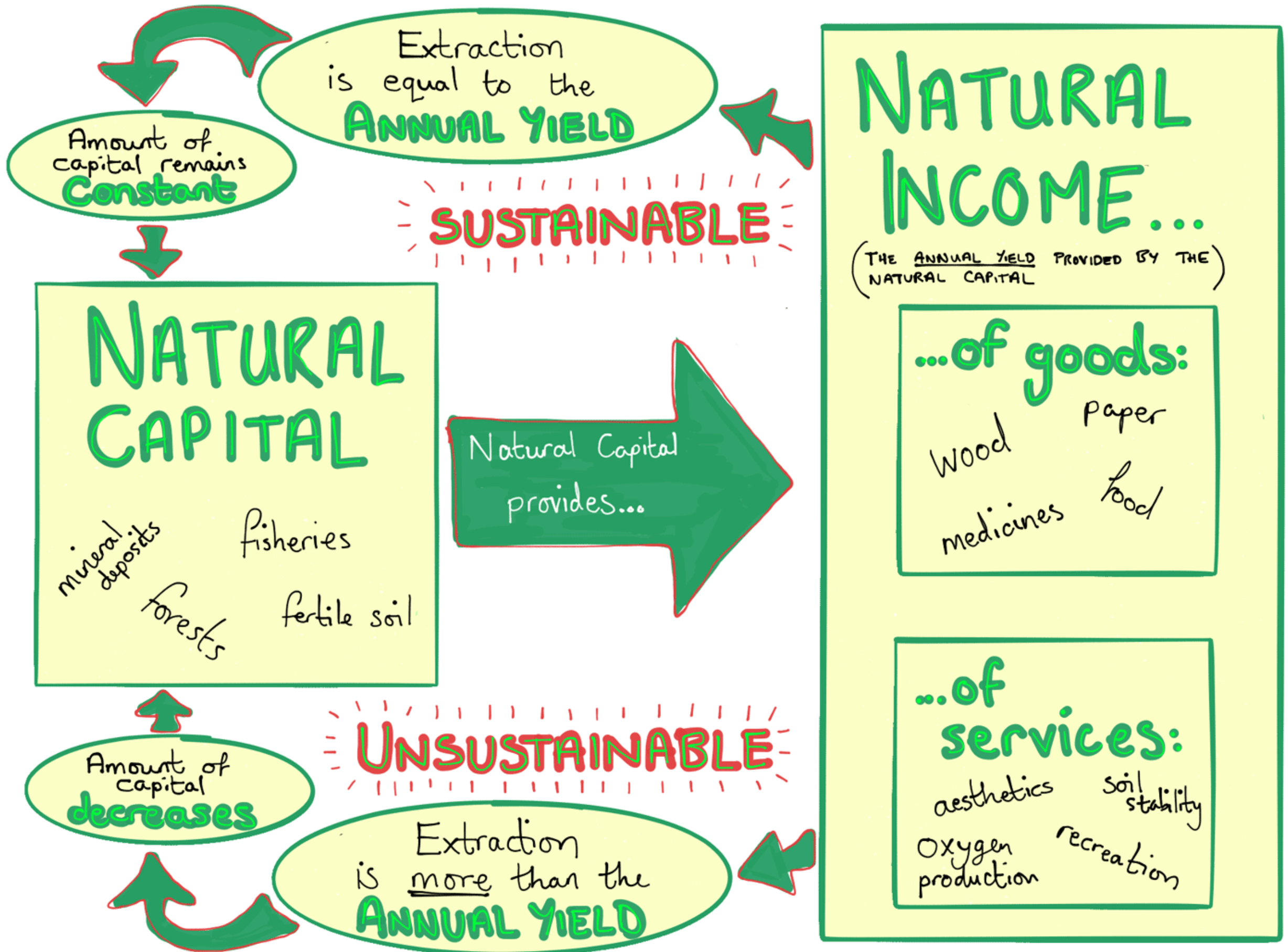
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# What is Natural Capital?







# Sustainable Development

- Development that meets the NEEDS of the present without compromising the ability of FUTURE generations to meet their own NEEDS
- Time and Space
- research (2015) show that “inequality exerts adverse impacts on environmental outcomes ... Gender inequality also impacts environmental quality negatively.”

# “Waste” generation

- Lebanon (2013 data) - 2.04 million tons of MSW / year
  - to increase 1.65% / year
  - each person: 0.8 - 1.2 kg of MSW/year
- Sweden (2016) - imports garbage

63 بلدية لا تزال غارقة في نفاياتها

شهيب: نبحث عن مكان لطمرها بهدوء



جذدت بلدية برج حمود رفضها استقبال النفايات القديمة (مروان طحطح)

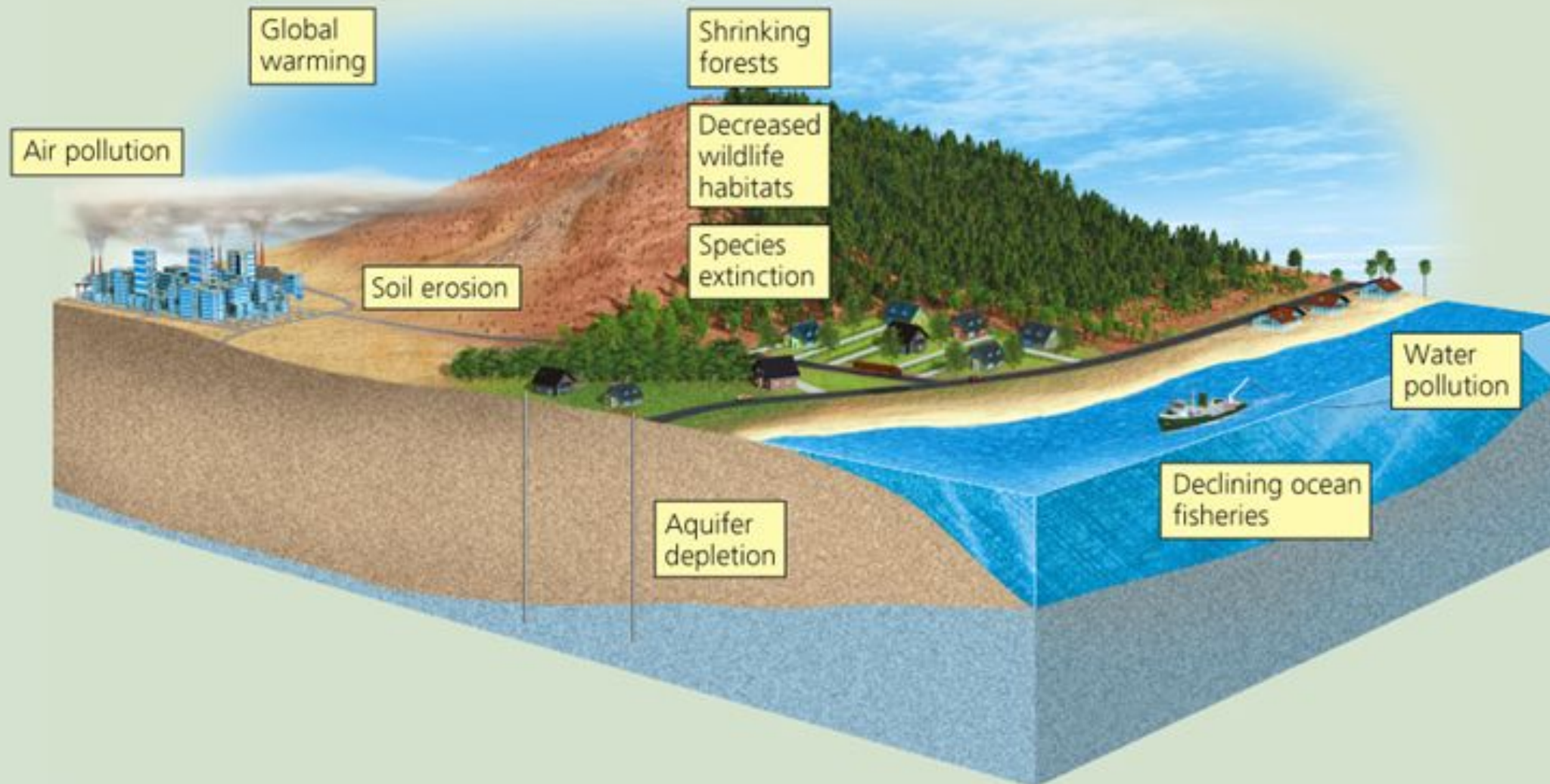
لا تزال النفايات متراكمة في معظم شوارع بلدات المتن وكسروان. السبب أن نحو 63 بلدية من أصل 108 لا توجد فيها عقارات كافية لإيداع أطنان النفايات بانتظار حل ما؛ فقد رفضت بلدية برج حمود استخدام المكب القائم في نطاقها إلا للنفايات «الطارئة»، في حين أعلن الوزير أكرم شهيب أن الحل ممكن بعد إنجاز الخلية الأولى لمطمر برج حمود في 7 تشرين الأول المقبل



# Degradation of Normally Renewable Natural Resources and Services

## NATURAL CAPITAL DEGRADATION

### Degradation of Normally Renewable Natural Resources





# Where are we now?

- Half of the forests that originally covered 46% of the Earth's land surface are gone. Only one-fifth of the Earth's original forests remain pristine and undisturbed.
- Primarily because we are degrading the habitats of this earth, global populations of fish, birds, mammals, amphibians and reptiles have declined by 58% between 1970 and 2012, with an annual decrease of 2%. Wildlife populations have declined, on average, 67%.
- Between 10 and 20 percent of all species will be driven to extinction in the next 20 to 50 years. Based on current trends, an estimated 34,000 plant and 5,200 animal species - including one in eight of the world's bird species - face extinction. Almost a quarter of the world's mammal species will face extinction within 30 years. Up to 47% of the world's plant species are at risk of extinction. 60% of the world's coral reefs, which contain up to one-fourth of all marine species, could be lost in the next 20-40 years. Hundreds of thousands of sea turtles and marine mammals are entangled and drowned by irresponsible fishing practices every year. More than 20 percent of the world's known 10,000 freshwater fish species have become extinct, been threatened, or endangered in recent decades. Sixty percent of the world's important fish stocks are threatened from overfishing.
- Desertification and land degradation threaten nearly one-quarter of the land surface of the globe. Over 250 million people are directly affected by desertification, and one billion people are at risk.

# Ecosystem services

We - people - have impacted 9 critical earth systems: 1) biosphere integrity (or destruction of ecosystems and biodiversity), 2) climate change, and 3) its twin problem ocean acidification, 4) land-system change, 5) unsustainable freshwater use, 6) perturbation of biogeochemical flows (nitrogen and phosphorus inputs to the biosphere), 7) alteration of atmospheric aerosols, 8) pollution by novel entities, 9) stratospheric ozone depletion.

# Pollution

- Point-source / non-point source
  - know the difference between the two

# Welcome back

- Finish Chapter 1 today
- Reminder: for slides, syllabus, etc, pls go to:  
<http://greenresistance.wordpress.com/env-200/>
- Reminder: 1st assignment due Wednesday - extension: midnight
- Exam 1 (tentatively): September 30 (Saturday)



# IPAT

- Impact = Population \* Affluence \* technology

## The IPAT Equation

The IPAT equation is a widely used simplification of the factors causing environmental degradation. The equation is  $I = P \times A \times T$ . This is short for environmental **I**mpact = **P**opulation x **A**ffluence (consumption per person) x **T**echnology (impact per unit of consumption). It's crucial to remember that the three factors are intermediate causes, not root causes.

$$\begin{array}{ccccccc} \text{Impact} & = & \text{Population} & \times & \frac{\text{consumption}}{\text{per person}} & \times & \frac{\text{impact}}{\text{per unit of consumption}} \\ \mathbf{I} & & \mathbf{P} & & \mathbf{A} & & \mathbf{T} \end{array}$$

Let's talk about Population & Consumption

# Ecological Footprint

- Per capita ecological footprint: biologically productive land and water needed to supply (renewable) resources and absorb waste for each individual
- Carbon footprint: Area needed to absorb the CO<sub>2</sub> emissions generated by your home, energy use, and transportation
- Food footprint: Area needed to grow crops, fish, and graze animals, and absorb carbon emissions from food processing and transport

# The Ecological Footprint

MEASURES

how fast we consume resources and generate waste



Energy



Settlement



Timber & Paper



Food & Fiber



Seafood

COMPARED TO  
how fast nature can absorb our waste and generate new resources.



Carbon Footprint

Built-up land



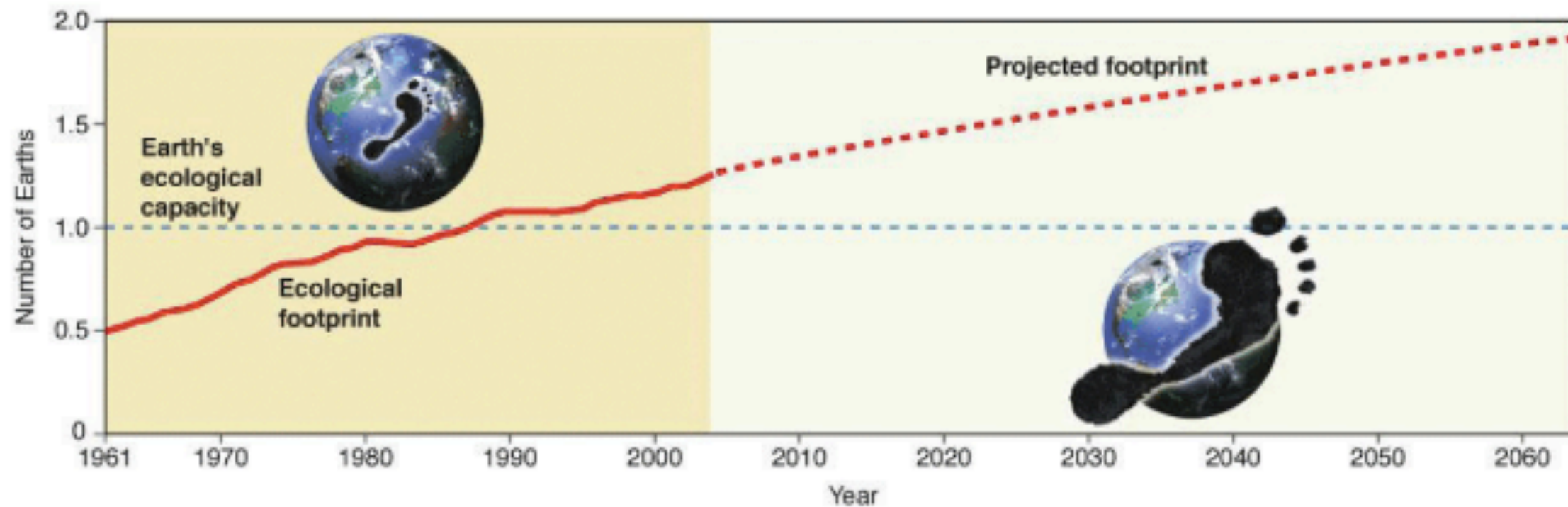
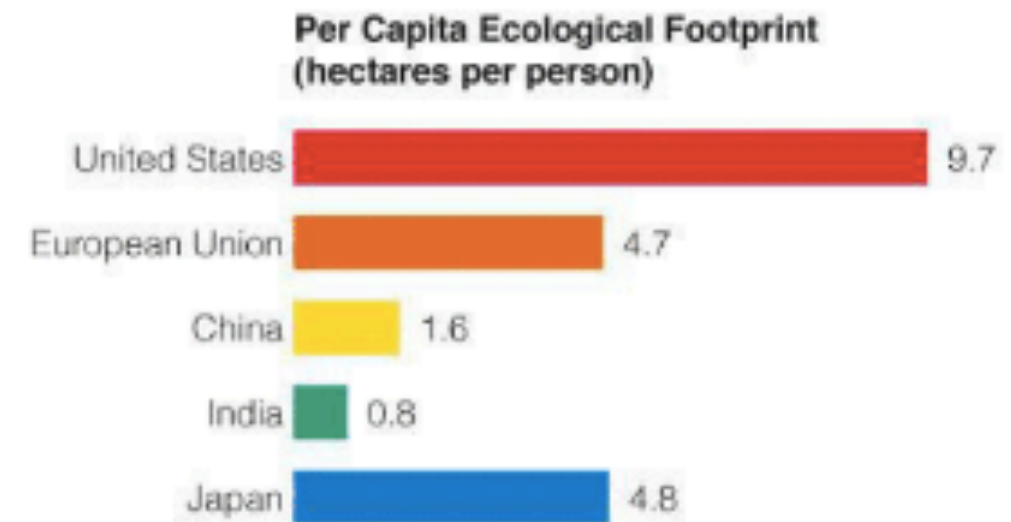
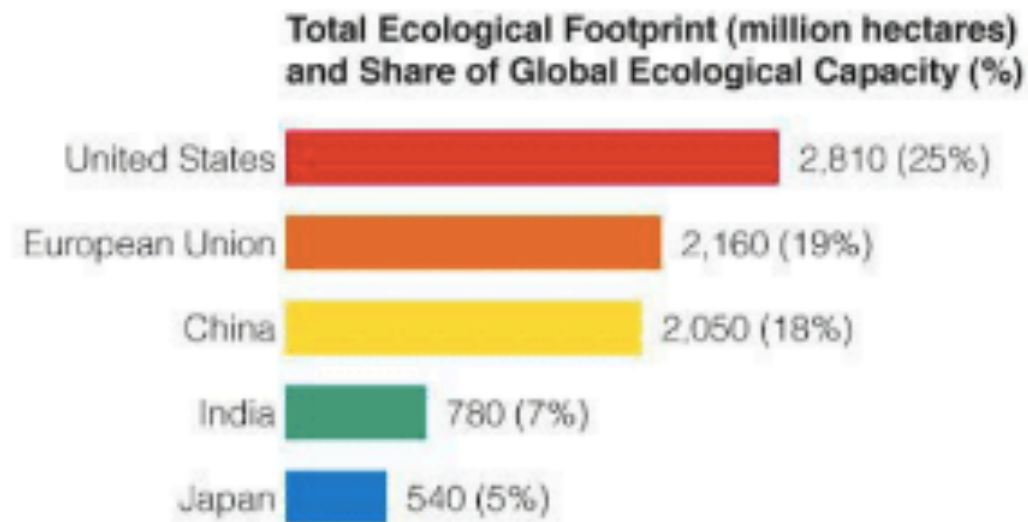
Forest

Cropland & Pasture



Fisheries

# Ecological Footprint





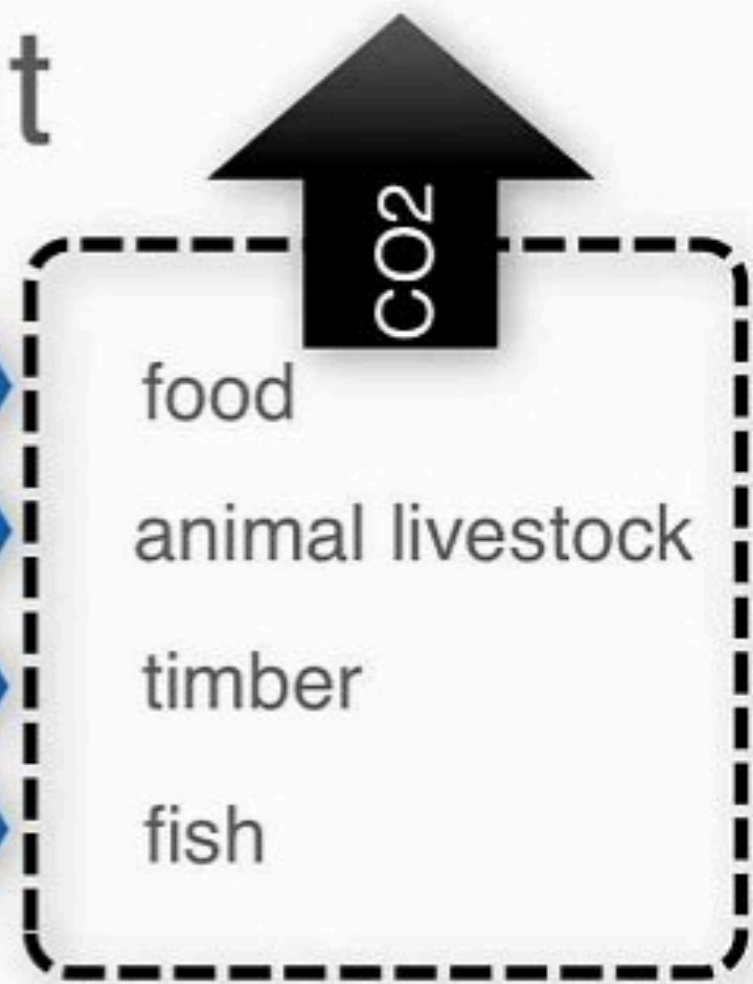
# Countries With The Largest Ecological Footprints

The Middle Eastern countries of United Arab Emirates, Qatar, and Bahrain have the highest ecological footprints.

## Ecological Footprint



bioproductivity





# 1st assignment

CALCULATE YOUR FOOTPRINT

DONATE



Global Footprint Network  
Advancing the Science of Sustainability

OUR WORK

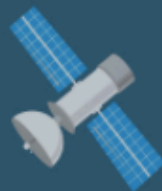
TOOLS & RESOURCES

ABOUT US

NEWS



How many Earths  
are needed to support  
your lifestyle?



CALCULATE YOUR FOOTPRINT

# 1st assignment (2.5%)

- Calculate your footprint: <http://greencred.me/> and save and share it with me.
- Email me ([rania.z.masri@gmail.com](mailto:rania.z.masri@gmail.com)), an essay, detailing:
  - your footprint, and why it is what it is
  - your thoughts on your footprint
  - no more than one page
  - (proper English please) - essay should be a MS Word Document
  - deadline: Wednesday midnight.

# Tipping points...

- Natural systems have ‘tipping points’
  - “time delay between the unsustainable use of renewable resources and the resulting harmful environmental effects”
  - human body has “tipping points” - examples?
  - ecological tipping point, or threshold level, or carrying capacity: often irreversible shift in the behavior of a natural system
    - examples?

# **How Antarctic ice melt can be a tipping point for the planet's climate**

13 September 2017, by Chris Turney, Jonathan Palmer, Peter Kershaw, Steven Phipps And Zoë Thomas, The Conversation

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# negative... and positive tipping points

**Apo Island in the Philippines provides an example of environmental tipping points in action.**

- **The introduction of destructive fishing methods was a “negative tip” that set the regional fishery on a forty-year downward spiral to virtual collapse.**
- **The creation of a small marine sanctuary was a “positive tip” which set in motion a cascade of ecological and social changes that restored declining fish stocks and returned the island’s marine ecosystem to health.**



# the 'negative'

Fishery was healthy and sustainable, providing ample harvest to support fishermen and their families. During the years following World War II the growing human population and increasing fishing pressure made the fishery increasingly vulnerable to unsustainable fishing.

The “negative tip” came with the introduction of four destructive fishing methods to the Philippines:

- Dynamite fishing, which started with explosives left over from World War II and gained momentum by the 1960s;
  - *Muro-ami* (from Japan). Fish are chased into nets by pounding on coral with rocks.
  - Cyanide, introduced during the 1970s for the aquarium fish trade. Aquarium fish are no longer collected in this region, but cyanide remained.
  - Small-mesh nets. Worldwide marketing of newly developed nylon nets brought small-mesh beach seines and other small-mesh nets to the region in the 1970s.
- PLUS - illegal encroachment of larger commercial fishing boats with gear such as purse seines and ring nets wherever enforcement is lax

# the 'positive'

- 1974: Marine sanctuary —> 14 families convinced
- 1982: Marine sanctuary for less than 10% of the fishing grounds —> guard duty rotating
- 1985: All families joined; legally binding
- Fishing increased; time spent decreased; eco-tourism increased

# Apo Island

- Less-intensive fishing produced more fish, which meant even less need for aggressive methods. Fishermen worked fewer hours and could earn extra money at other jobs.
- Habitat protection led to healthier reefs, which reeled in tourists. Extra income for infrastructure and education strengthened islanders' resolve to safeguard the habitat.
- Islanders controlled tourism to protect fragile reefs and adopted family planning, so the next generation won't overrun the fishery.

# positive feedback loop!



- Positive-Feedback Loops (vs negative feedback loop)
- Article (extra credit) - on blog: [Environmental Tipping Points: A New Paradigm for Restoring Ecological Security](#)



# The Commons

- Property or resource rights: private property, common property, open-access renewable resources
- 1968, Garret Hardin, ‘tragedy of the commons’ [later revised to ‘tragedy of the unmanaged commons’]
  - If all herders make the individually rational economic decision of increasing the number of cows they graze on the land, the collective effect will deplete or destroy the common.
- Elinor Ostrom, Nobel Prize winner of Economics
  - “When local users of a forest have a long-term perspective, they are more likely to monitor each other’s use of the land, developing rules for behavior,” she cites as an example. “It is an area that standard market theory does not touch.”

# Managing the commons

The first condition for the institutional basis of the success of these mechanisms is the clarity of the law (Who can do what? What can one not do? Who punishes whom? And how?).

In addition to being clear, the rules must be shared by the community. This is why another essential element of self-government is the establishment of methods of collective and democratic decision-making, able to involve all users of the resource.

Furthermore, the mechanisms of conflict resolution must be local and public, so as to be accessible to all individuals of a community. Besides mechanisms of graduated sanctions, a mutual control of the resource among the users themselves must be established.

Finally, the rules, in addition to being clear, shared and made effective by all users, must not conflict with higher levels of government.

# Cultural changes ...

- Culture: the whole of a society's knowledge, beliefs, technology and practices
- (160,000-)200,000 years ago... we arrived
- agricultural revolution: 10,000 - 12,000 years ago ...
  - before: most of our existence: hunters and gatherers
- industrial-medical revolution:  $\pm$  275 years ago
- information-globalization revolution:  $\pm$  50 years ago

# “4 basic env problems”

- (according to the book)

1. Population

2. Affluence / consumption

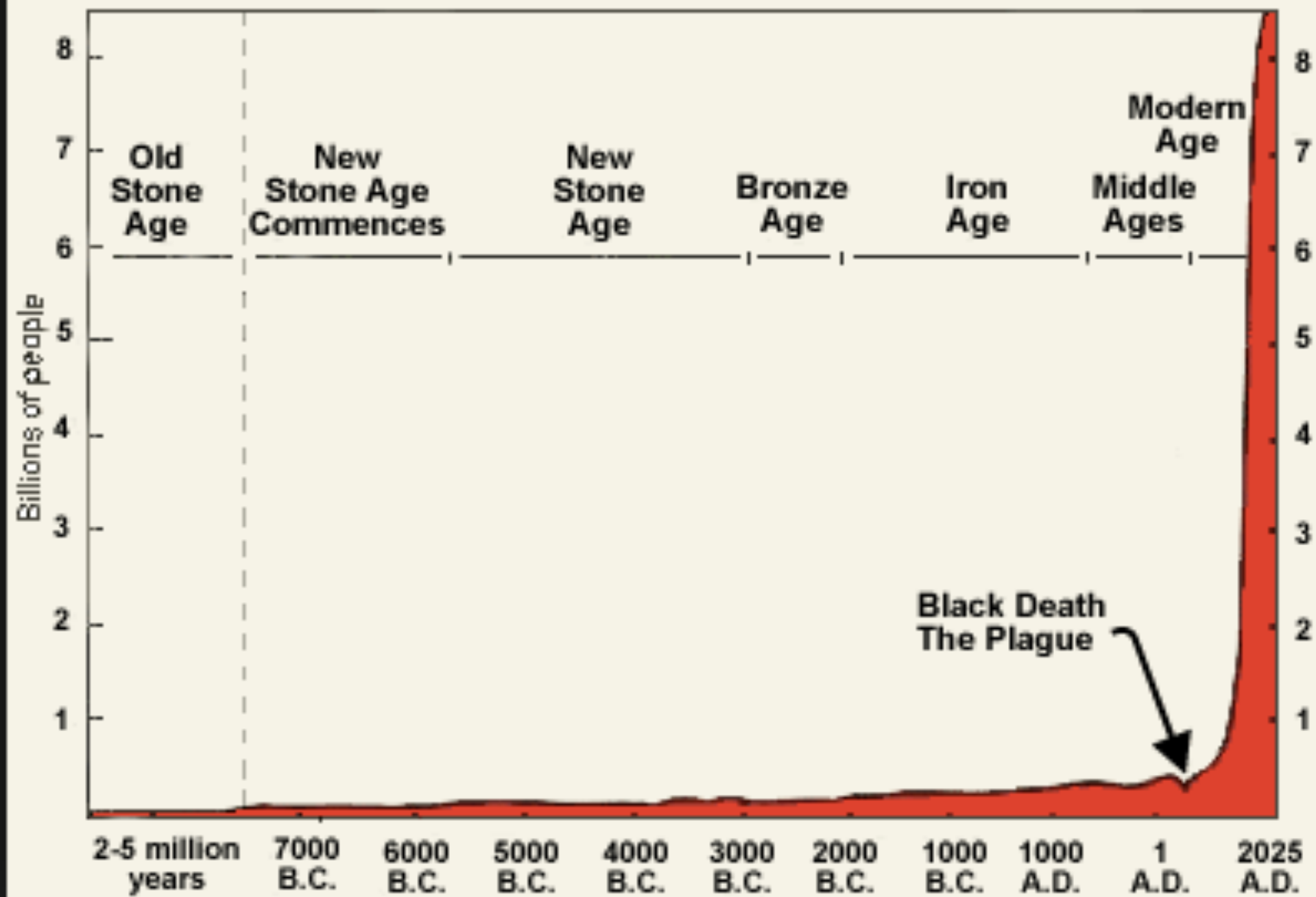
3. Poverty

4. “Prices do not include the value of natural capital”

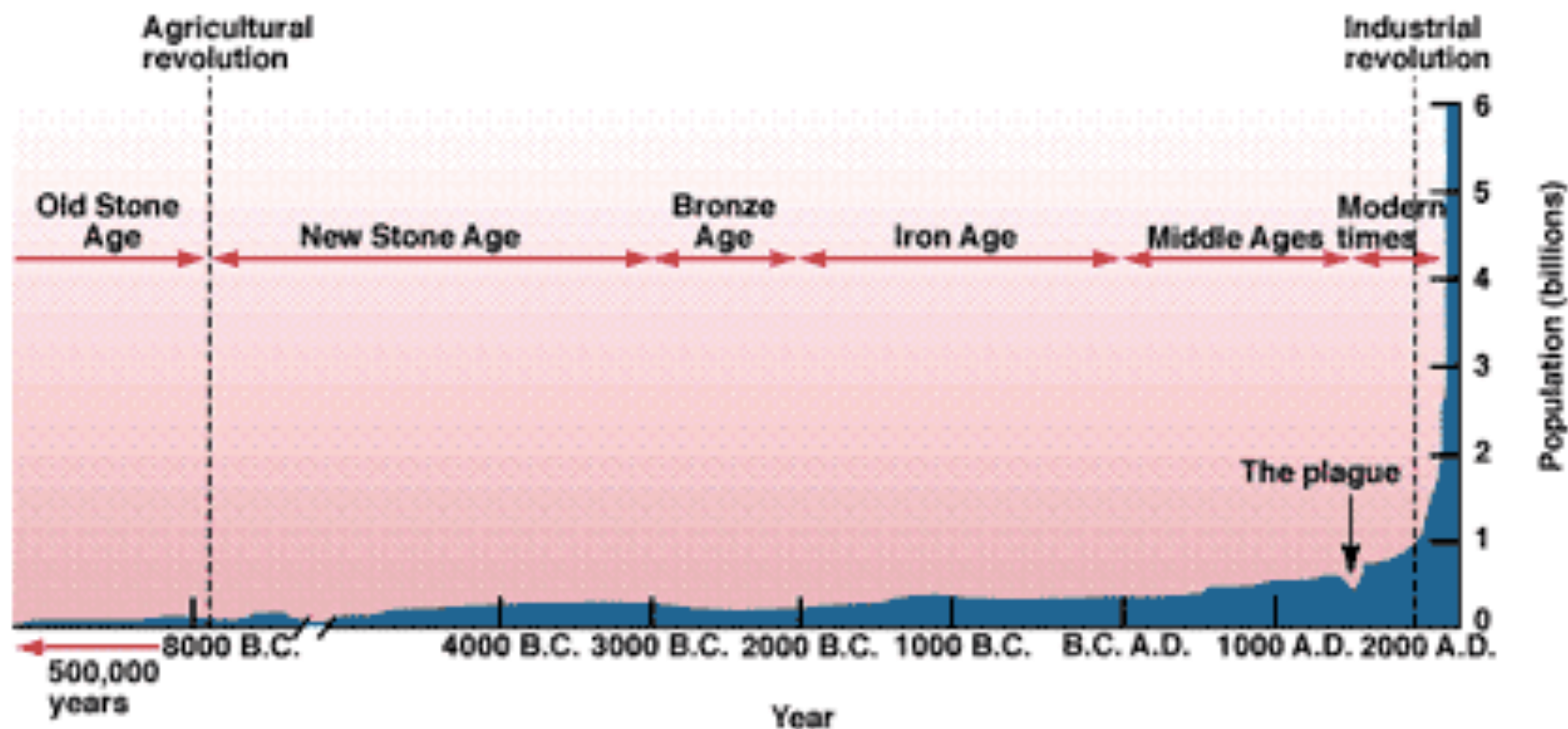
Do you agree?



## World Population Growth Through History

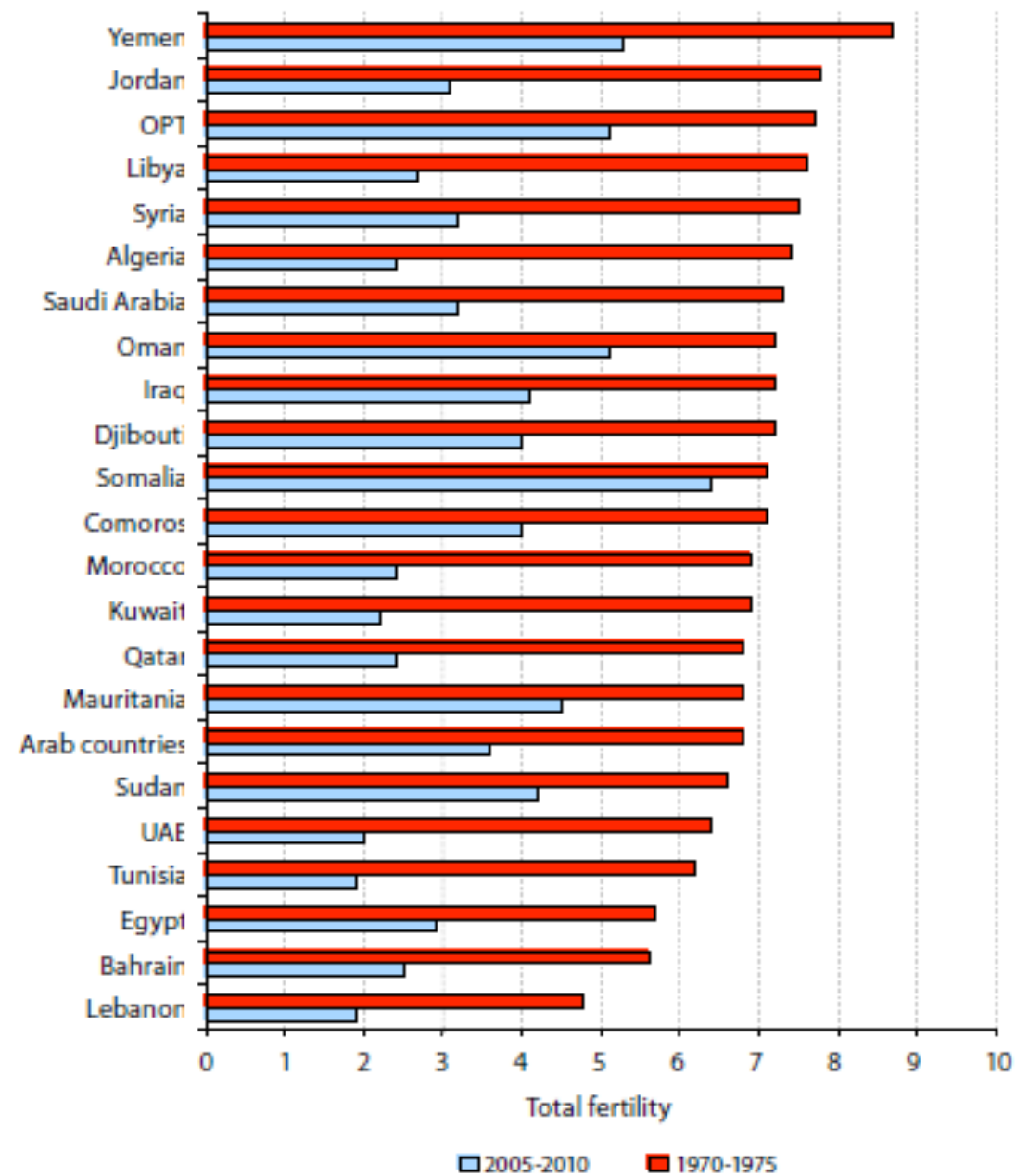


# Human population levels through history.

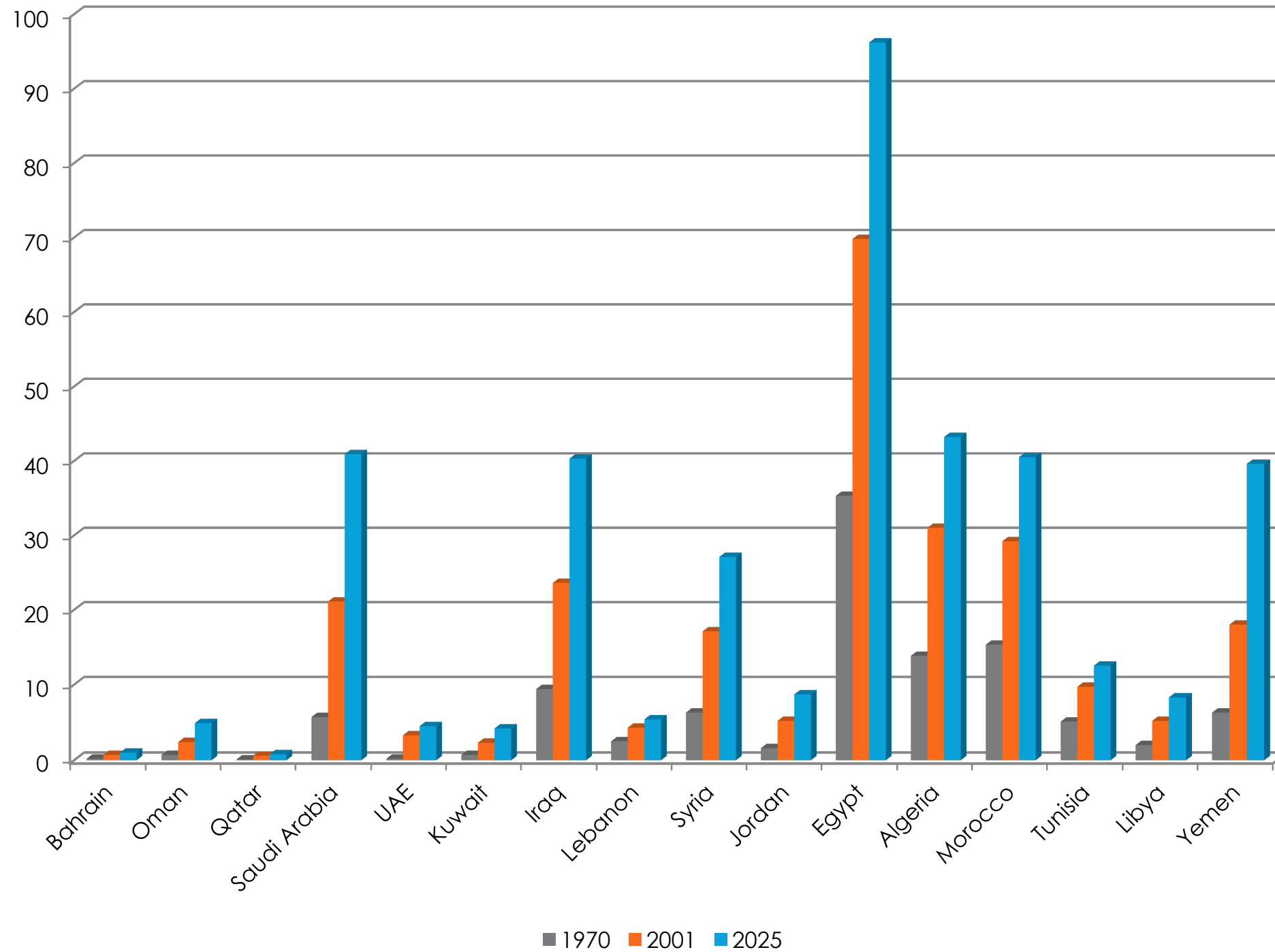


Although fertility rates in the Arab world are declining...

## Total fertility in the Arab world: 1970 - 2010



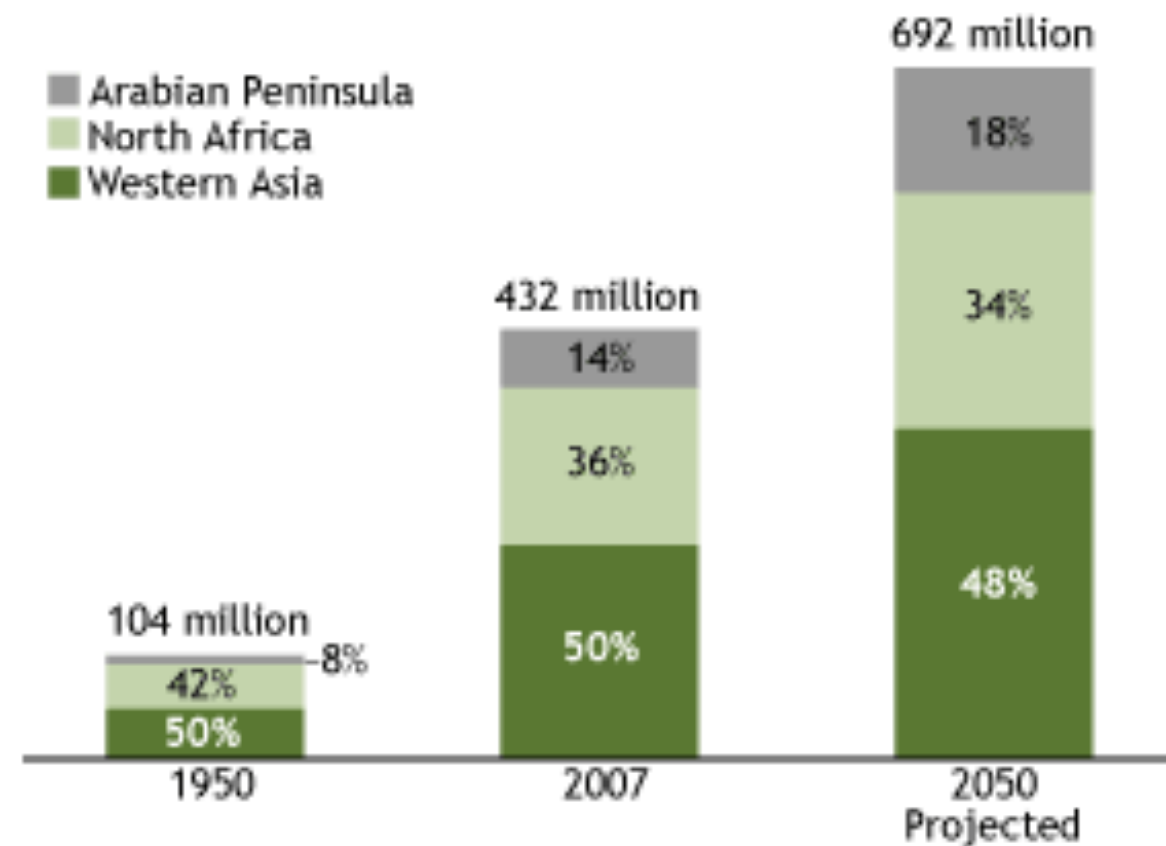
## Population growth (millions): 1970 - 2025



# population growth: 1950-2050

Arab region: among the fastest population growth rates (> 2%/year)

- GCC population: to double by 2040
- Maghreb population: to double by 2060





## Lebanon Population Growth

Lebanon has had very uneven population growth over the past 50 years, and it's currently growing at 1% per year. Its urbanization rate is rapidly growing and expected to reach 86% in 2020, at which point its urban population will reach 4.1 million, with a total population pushing 6 million in the next decade.

## Lebanon Population Clock

What is the population of Lebanon (as of September 18, 2017)?	6,029,954
Last UN Estimate (July 1, 2017)	6039276
Births Per Day	49
Deaths Per Day	14
Net Migrations Per Day <a href="#">?</a>	-153
Net Change Per Day <a href="#">?</a>	-118
Population Change Since January 1st	-30,680

Baabda	9,000
Batroun	10,852
Bcharre	20,000
Jbail	20,784
En Naqoura	24,910
Baalbek	30,916
Zahle	78,145
Djounie	96,315
Habbouch	98,433
Nabatiye et Tahta	120,000
Tyre	135,204
Sidon	163,554
Tripoli	229,398
Ra's Bayrut	1,251,739
Beirut	1,916,100

Source: World Population Review

Male Life Expectancy <a href="#">?</a>	78.453 years
Female Life Expectancy <a href="#">?</a>	81.983 years
Total Fertility Rate <a href="#">?</a>	1.718 children/woman

# “4 basic env problems”

- (according to the book)

1. Population

2. Affluence / consumption

3. Poverty

4. “Prices do not include the value of natural capital”

Do you agree?

# Key questions to think about...

- Who is responsible - for a shift towards sustainability?
- What questions need to be asked, in assessing a policy, or an action?

