Class Sessions #4  
10 October 2019

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# Wrap up Impacts lecture from previous class

# Causes (“Drivers”) of Climate Change?

## Causes are personal

## But also structural

# 3 drivers of human impacts

## IPAT (Ehrlich & Holdren, 1972)

## Impact = Population \* Affluence \* Technology

### Impact: environmental harm (CO2 emissions, fish catch)

### Population: # of people

### Affluence: $ per person (income)

### Technology: impact per $ (carbon intensity)

## Kaya:

### CO2 = Pop’n \* ($GDP/Pop’n) \* (Energy/$GDP) \* (CO2/Energy)

### CO2 = Economic Growth \* Technology Change .

### How much CO2 grows depends on:

#### Economic Growth: Population Growth \* Income Growth

#### Technology Change: Energy intensity \* Carbon intensity

# Doubling CO2 emissions

## We will double CO2 emissions by 2033: assuming current population & affluence growth rates (3.1%) continue

## To reduce emissions requires technology improvements that are greater than 3.1% per year

## So, what about technology?

## Halving CO2 emissions will be hard

### If we don’t address population & affluence, current CO2 emissions will ***double*** by ***2033***

### If we ***eliminate*** population AND affluence growth, technology improvements take ***until 2110*** to cut emissions in half

### In short: 0.7% **≠** 3.1% per year

# Personal version of the IPAT equation

## I chose to have children and have two (P)

## I want them to have a better life than me (A)

## I ask for raises (A)

## When I receive them, I spend them (A, T)

## I drive too far (and too fast) to work (T)

## My Footprint

# Let’s Create a Model of Climate Drivers

## What factors lead to P, A, and T?

### Personal factors

### Structural factors

## Understand processes that lead to emissions to identify points for “policy intervention”

## Structural factors

### Values related to “what’s a good life”

### Kids

### Stuff

### Freedom

### Infrastructure: US: 20 tons/yr; EU 10 tons/yr

## What factors influence the rate of population growth?

# Changing Population Growth

## Some policies do influence population size, fertility

### Educating women

### Chinese one child policy (China 1.7/woman)

### French pro-natalist policy (France 1.98/woman vs. UK 1.66/woman)

### Catholic position on contraception

## So do social norms

### “When are you going to have kids?”

### “I wonder why they don’t have any kids?”

### “Congratulations on your new baby!”

### “I want to live a nice long life.”

## Yet population appears “off limits” politically (not mentioned at Copenhagen)

## <http://www.gapminder.org/videos/religions-and-babies/#.VDtfTBZvDGp>