HONR 229L: Climate Change: Science, Economics, and Governance

Discussion #4: One Island, Two Peoples, Two Histories: The Dominican Republic and Haiti

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ELMS Page: https://myelms.umd.edu/courses/1249026

13 September 2018

AT 3, Q 1:

This chapter focuses on three examples of societal success that occurred in New Guinea, Tikopia, and Japan. State the two vastly different types of political structures employed on these three islands, briefly (sentence or two) state what each structure means, then identify which structure was used on each island. Note: these two structures will be a recurrent theme of the class.

**Bottom-up (Tikopia and New Guinea):** local inhabitants share a sense of community with others and their environment, and are stewards of their surroundings because they care about their homes/neighbors and know that problems affect them directly.

**Top-down (Japan):** centralized government oversees a larger jurisdiction and ensures through policy and enforcement that resources / land is protected for long-term interest, despite conflicting short-term needs.

Nice succinct summary. Please note that in modern society, bottom-up can also refer to grass roots efforts that attempt to influence authorities (i.e., anti-war protests, gun control, etc.)
AT 3, Q 2:

Define silviculture and briefly summarize how the people of New Guinea used innovative approaches for both silviculture and agriculture. Can keep your answer to 2 to 3 sentences :) 

1) Silviculture is the growing of trees by humans, farming them like slow-growing crops. In the New Guinea Highlands, they transplanted Casuarina seedlings that sprouted along the stream banks to their gardens, where the trees increased the soil fertility, reduced erosion, reduced beetle infestation, and provided shade, all the while producing timber for various uses. Other agricultural feats include vertical drainage ditches, resourceful composts and mulches, crop rotation of legumes, terraces, and soil retention barriers.

Great summary; excellent writing

2) … Diamond suggests that an inquisitive soul might have found the seed near a stream long ago and just "tried it out".

Historically, humans have been rather resourceful farmers. Maintaining a steady supply of food was the most urgent matter for many ancient people.
AT 3, Q 3:

What two specific problems did the people of Tikopia have to overcome, in order to keep their 1.8 sq mile habitat continuously populated for 3000 years? Think about that for a moment ... 1.8 sq mile for 3000 years! Dang!!!

The two specific problems that would have lead to Tikopia's collapse if not controlled were the issue of sustainable food supply and maintaining a stable population on the island. Because there was so little space, virtually every piece of land was taken up by either farmland or living space. By maintaining the population size with methods of contraception, the Tikopians never allowed for a population that they could not support. Sustainable food supply was extremely important so that everyone on the island could eat using the small amount of farmland that was available to them.

Ancient Tikopians were incredibly disciplined, resourceful, and creative in addressing both problems.
AT 3, Q 4:

Around 1700, the Shogun of Japan adopted a multi-staged, elaborate approach for woodland management. The responses are described as "negative responses" and "positive responses" enacted in a multi-staged approach. Briefly, in 2 to 3 sentences, summarize how the ruling class was able to manage the woodlands of Japan.

In your answer, state which of the two political structures described in your reply to Q1 was used. Finally, in another sentence or two, state whether you think the other political structure would have worked.

The ruling class was able to manage the Japanese forests through their usage of a top-down approach to management. Some of the shoguns used religion, in the Japanese's case Confucianism, to promote the idea of conserving natural resources and limiting consumption. The rulers also had officials create restrictions on how much of the forest may be used, who may use it, when they could use it and what they could use it for, etc, and had workers ensure that the restrictions were being followed by the Japanese commoners. They also developed methods on how to promote the regrowth of the forests by adopting silviculture.

I do not believe that a bottom-up structure would have worked around the year 1700. This is because Japan had a population of nearly 26 million people, and spanned over 100,000 square miles. This would have bred the idea that even if something is occurring in the south, it would not affect people in the north. I believe that Japan was just too large and too populous for a bottom-up structure to work efficiently.
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Try to not use the word “This” as a subject of a sentence … especially twice in a row!
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I do not believe that a bottom-up structure would have worked around the year 1700. Japan had a population of nearly 26 million people, and spanned over 100,000 square miles. The enormous population and area meant that if something was occurring in the south, it would not affect people in the north. I believe that Japan was just too large and populous for a bottom-up structure to work efficiently.
AT 3, Q 5:

Remarkably, in the essay about Tikopia, Jared Diamond has resisted the temptation to draw an analog to modern, global society.

In your own words, in a paragraph (i.e., lead with a strong topic sentence), describe how Tikopia might serve as an analog to modern society. In your reply, see if you can work in the phrase "carrying capacity", which probably has already come up a few times in class.

Every population on the planet has a carrying-capacity; humans are not an exception. On Tikopia that carrying capacity was 1,200 people as that’s all their 1.8 square mile plot of land could support. On Earth, in general, the answer is less clear however many scientists agree we are likely fast-approaching our limit due to the exponential growth of our species in the last century and continuing on with estimates showing that reach a population 9.7 billion by 2050 according to the United Nations. As such, we on present-day Earth, face very similar problems as those Tikopia faced for the last 3000 years: how can we reliably produce a food supply for a growing population of 7.6 billion (current population), and how can we, if need be, prevent the population from growing beyond our limit?

Great thoughts! But there are multiple thoughts per sentence, and perhaps even a run-on sentence.
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Tikopia serves as an analog to modern society in that despite the larger scale, it still faces the same problems of having a sustainable food supply and controlling population growth. Tikopia took some intense measures to maintain their population growth, aware of the fact that ignoring the issue would cause the population to exceed their carrying capacity, which would lead to their demise. Tikopia also needed to have an elaborate emergency plan for food in case natural disaster struck (since they could wreck their only source of food). Although the modern world has a high carrying capacity, it is important to recognize that it can’t sustain an infinite number of people, so taking ethical population control measures is vital to prevent disastrous consequences. Also, with the effects of climate change intensifying, the prevalence of natural disasters are increasing, which could destroy land that’s used to produce the majority of the world’s food supply, so the modern world should be prepared with an emergency plan for food.

Emergency plan for food … great idea!

Please see https://www.croptrust.org/our-work/svalbard-global-seed-vault/faq-about-the-vault/
Consequences of Climate Change

Hurricane intensity is increasing, affecting populations in coastal areas

• Projection of the effect of global warming on hurricanes requires high resolution calculations on a serious supercomputer

• Some simulations project that at end of century, rising GHGs will lead to:
  a) ~ 30% decrease in annual mean occurrence number of tropical cyclones, due to larger increases in temperature in the upper troposphere than the surface, resulting in a more stable atmosphere
  b) an increase in maximum surface winds of the tropical cyclones that do occur:
    i.e., hurricanes less frequent but more powerful

• There are two monster storms active at the moment:

  Hong Kong (CNN) — As the US east coast braces for Hurricane Florence, an even stronger super typhoon is barreling down on southeast Asia, with Hong Kong and Macau square in its path.

  Super Typhoon Mangkhut, known as Super Typhoon Ompong in the Philippines, is currently equivalent to a category 5 Atlantic hurricane, with winds of at least 252 kilometers per hour (157 mph), stronger than Florence, which is expected to cause massive flooding and devastation in the Carolinas.

  Mangkhut has already swept past the US territory of Guam, in the western Pacific, where it caused flooding and power outages. The storm is expected to strengthen further in the next 24 to 48 hours, according to CNN Meteorologist Michael Guy, before it weakens slightly to a category 4 equivalent storm as it approaches the the Philippines island of Luzon.

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  ![NSF GV Research Aircraft](image1)
  ![Northern Half of Guam](image2)

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Yigo Mayor Rudy Matanane

Gov. Eddie Calvo on Tuesday said he is poised to ask President Donald Trump to declare a state of emergency for Guam after Typhoon Mangkhut damaged homes, caused widespread power outages, knocked down power poles, flooded some areas, uprooted large trees, and littered villages with typhoon debris.

In Dededo and Yigo, families lost entire houses as the typhoon pounded the island with damaging winds and strong rains from late Monday afternoon to past midnight.

Consequences of Climate Change

Hurricane intensity is increasing, affecting populations in coastal areas

- Projection of the effect of global warming on hurricanes requires high resolution calculations on a serious supercomputer

- A paper just published and summarized in Tuesday’s Washington Post suggests:
  Bhatia et al., *Journal Climate*, 2018

What's more, the research found that storms of super-extreme intensity, with maximum sustained winds above 190 mph, also became more common. While it only found nine of these storms in a simulation of the late 20th century climate, it found 32 for the period from 2016 to 2035 and 72 for the period from 2081 to 2100.

Perhaps most significantly, the new research finds that rapid intensification appears to be the key mechanism driving stronger storms in a warmer climate. Sure enough, in future years it finds more storms that strengthen by more than 45 mph in 24 hours, as Hurricane Florence did, and even a number of rare and super-extreme storms that intensify by more than 115 mph in 24 hours.

The difference between the two groups, prior research has found, is often a difficult-to-forecast process in which the hurricane rapidly strengthens, usually in the presence of highly favorable environmental conditions, such as extra warm seas to considerable depths, lots of available humidity in the air and slack winds around the storm.

Consequences of Climate Change

Confounding factors:

a) most cyclones (or hurricanes) do not make landfall and were not well observed before the modern satellite era

http://www.c2es.org/science-impacts/extreme-weather/hurricanes
Consequences of Climate Change

Confounding factors:

b) massive growth of homes in exposed coastal environments

https://twitter.com/StephenMStrader/status/1039210154795917314
Consequences of Climate Change

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Confounding factors:

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North Carolina, Warned of Rising Seas, Chose to Favor Development

The law, known as H.B. 819, was widely criticized and even ridiculed when it passed, but it was favored by the state’s business interests, which argued that it was needed to protect property values. Business leaders had been jolted by a state commission’s 2010 report saying that sea levels could rise as much as 39 inches by the year 2100, which would devastate the coast and swamp billions of dollars’ worth of real estate.

Early versions of the 2012 bill even dictated how officials were allowed to forecast sea levels: Only historical data could be used, and not any computer models that showed that the rate of rise would be faster in the future than in the past — an approach that would seriously underestimate the effects of climate change.

The North Carolina state legislature pushed back against the 2010 sea level warnings even though researchers and universities in the state have been at the forefront of the scientific work that produced them.

Let’s look at data:

**Power Dissipation Index** accounts for cyclone strength, duration, and frequency.

[Source](https://www.epa.gov/climate-indicators/climate-change-indicators-tropical-cyclone-activity)
Consequences of Climate Change

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https://www.epa.gov/climate-indicators/climate-change-indicators-tropical-cyclone-activity
This evening

45 min long documentary
Gripping first hand account of the banning of CFCs to save the ozone layer
Premiered in the UK on 18 August 2018; will premier in the US on PBS on Earth Day 2019
We’ll have private screening with one of the key subjects of the film on 13 Sept, 5:30 pm, ATL 3400
Following the screening, our guest will answer student’s questions
A week from today

• Please provide a brief description of your paper, including:
  a) the topic
  b) which reading or readings will serve as the starting point for the paper
  c) how you will expand upon the reading material (i.e., critical analysis of the reading; or, connecting multiple readings; or, relating a reading to the overall objectives of the class)
  d) any other source material that you envision using

• “Paper Desc” assignment due 20 Sept on ELMS and on class website I maintain
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<th>Hispanic Overview</th>
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<th>Rain Shadow Effect</th>
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<td>Balaguer</td>
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Hispaniola Overview

Haiti
- French colonization
- Slave agriculture
- Less island area
- Larger population
- Lack of export
- Francois “Papa Doc” Duvalier
- Jean-Claude “Baby Doc” Duvalier

Both
- European Occupation
- Subject to environmental determinism
- Political instability

Dominican Republic
- Extensive National-Parks
- Spanish colonization
- Hydroelectric energy source
- Economically significant immigrants
- Rafael Trujillo
- Joaquin Balaguer
- Industrialized
The variation in forest cover between the Dominican Republic and Haiti is paralleled by differences in what?

Originally, both parts were similarly and largely forested.

Now, Dominican Republic: 28% forested
Haiti is 1% forested.

Today, their difference in forest cover reflects a difference in economy.

Environmentally, what caused these variations in forest cover?
- French exporting Haitian woods (deforestation)
- Haitian land cleared for sugar cane plantations (deforestation)
- East→West rains, start in DR
- Dominican plains w/ thick soils
- Haiti’s mountainous, limestone terrain
  - “Rain Shadow Effect”
“Rain Shadow Effect”

- Warm, moist air from the sea
- Rain from expansion and cooling
- Region of rain shadow
- Dry air from compression and warming
- Evaporation from compression and warming
Plate 24. The almost completely deforested landscape of the New World’s poorest country, Haiti, which occupies the western part of the island of Hispaniola.
Plate 23. A partly wooded agricultural landscape of the Dominican Republic, occupying the eastern part of the island of Hispaniola, and many times richer than Haiti.
Class Discussion:

Is Haiti’s societal downfall due to environmental determinism or to their own actions?

“Some environmental differences do exist...most of the explanation has instead to do with their histories, attitudes, self-defined identity, and institutions, as well as between their recent leaders of government.”

“Yes, environmental problems do constrain human societies, but the societies' responses also make a difference. So, too, for better or for worse, do the actions and inactions of their leaders.”
Compare and contrast the difference in land area and population of the Dominican Republic and Haiti

- Haiti had a population 7x higher than its neighbor during colonial times.
- Haiti's area is only slightly more than half of that of the Dominican Republic.
- Today, Haiti has ~10 million people compared to the Republic's 8.8 million.
- Haiti has 2x the population density compared to DR.
Effects of Gold

Christopher Columbus landed in 1492
Spaniards saw that Tainos had gold, wanted it

Island Implications:
- Original population: ~500,000
- 1519 A.D. (29 year later): 3,000
  - Smallpox/Eurasian disease
  - Slave labor
  - Figured island suitable for sugarcane
- Spaniards’ shifted attention to Mexico/Peru/Bolivia, left the Eastern portion
- French established in Western end, heavily invested in plantations
- 1795: Spain gave France all of the island
Effects of Gold Cont’d

Island Implications Cont’d:

- 1801: French Saint-Domingue slave rebellion
- 1804: France abandoned Hispaniola, Haiti achieved independence
- 1805: Haitians invade the eastern, Spanish side
- 1809: Spanish settlers resumed as Spain colony
- 1821: Santo Domingo declares independence
  - Reannexed by Haiti until 1844
- 1850's: Haitians keep attempting invasions
- Political instability for everyone from 1844 to 1915, which then had US occupation due to WW1
- Rafael Trujillo 1930-1961, 31 years
Rafael Trujillo - Dominican Dictator

“For some months, I have traveled and traversed the border in every sense of the word. I have seen, investigated, and inquired about the needs of the population. To the Dominicans who were complaining of the depredations by Haitians living among them, thefts of cattle, provisions, fruits, etc., and were thus prevented from enjoying in peace the products of their labor, I have responded, 'I will fix this.' And we have already begun to remedy the situation. Three hundred Haitians are now dead in Bánica. This remedy will continue”

- 2 October 1937

01    |  Dominican Chief of the National Police
02    |  Head of the U.S. trained Republic military
03    |  Tortured or killed his possible opponents
04    |  Imposed an all-intrusive Police State
05    |  Industrialized the economy for profit
The Parsley Massacre / El Corte/ Kout kouto-a

El Generalissimo
Claiming that Haiti provided political asylum of Dominican opponents, Rafael Trujillo declares an attack on the border

The River of Blood
Dominicans chase Haitians with machetes, chasing and slashing them across the river border

The genocide lasted 6 days
An estimated 20,000 to 30,000 Haitians were killed during the week
Author Context + Novel Plot:
- Danticat was 12 years old when she left her native Haiti for the U.S.
- Danticat writes about a rarely recounted act of "ethnic cleansing" carried out in 1937 by the Dominican Republic's brutal dictator.
- Protagonist: Amabelle
  - All is quickly lost in the massacre: her home, friends, and fiancee; her health, beauty, trust, and hope.
- “A magnetic storyteller and quietly passionate witness to the madness of prejudice and genocide, Danticat presents an eloquent and unforgettable prayer of a shattered survivor.”
  - Donna Seaman
Divided island: How Haiti and the DR became two worlds
Class Discussion:

Despite their complex and violent history, do you think Dominican Republic and Haiti will ever be able to collaborate as Diamond suggests?

Be realistic, keeping in mind the division in language + culture and the track record of invasions + atrocities...
Recent News, Haitian TPS

- In January 2010, in a matter of seconds, an earthquake killed more than 220,000 people and decimated much of Port-au-Prince, including public health and government institutions.
- Days later, DHS wisely designated Haiti for TPS.

- One of the deadliest cholera outbreaks in modern history erupted in October 2010 when negligent U.N. sanitation practices led to infected raw sewage being dumped into one of Haiti’s major rivers.
- Then, in 2016, Haiti was struck by the most powerful hurricane to reach its shores in half a century — Hurricane Matthew.
Class Discussion:

The link between climate and hurricanes is well established: as Earth warms, hurricane intensity rises. If Haitian society collapses (due to tropical hurricanes), what do we do with these “climate” refugees?

Force Dominican Citizenship? US TPS Citizenship?

Provide French Citizenship due to historical colonization?

Let them all starve on their side of the island?
Class Discussion:

Joaquin Balaguer was a brutal dictator, but did protect the Republic’s watershed and hydroelectric power. Would you credit DR’s success today to him? Would you say he’s a good leader?

“Through his actions, he is credited with having consolidated the Dominican middle class, Dominican capitalism, and the country as it exists today, and with having presided over a major improvement in the Dominican economy. Those outcomes inclined many Dominicans to put up with Balaguer’s evil qualities.” pg. 347
A note to leave you with…
A society’s fate lies in its own hands and depends substantially on its own choices

“Not surprisingly, French Hispaniola's former slaves, who renamed their country Haiti killed many of Haiti's whites, destroyed the plantations and their infrastructure in order to make it impossible to rebuild the plantation slave system...it proved in the long run disastrous for Haiti's agricultural productivity, exports, and economy when the farmers received little help from subsequent Haitian governments in their efforts to develop cash crops. Haiti also lost human resources with the killing of much of its white population and the emigration of the remainder.”

- Page 335

“To European eyes, the oversimplified image was of the Dominican Republic as a Spanish-speaking, partly European society receptive to European immigrants and trade, while Haiti was seen as a Creole-speaking African society composed of ex-slaves and hostile to foreigners.”

- Page 336