

# **Environmental Problem Solving**

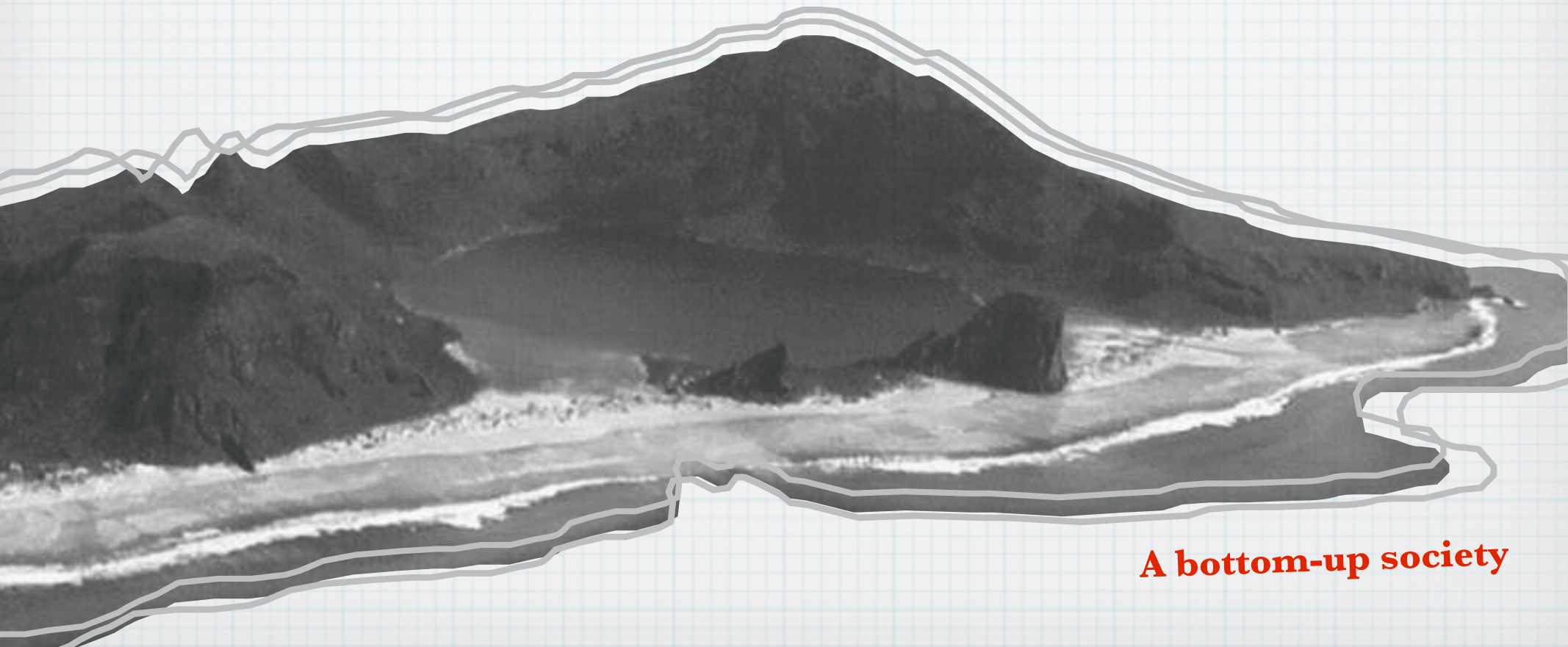
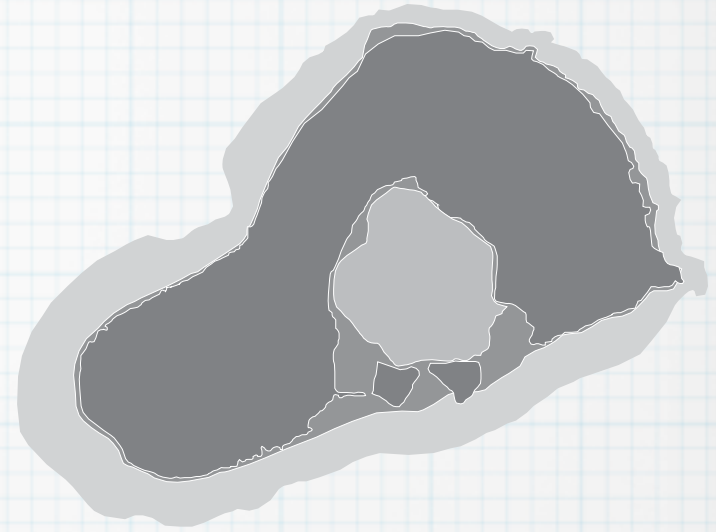


**Jared Diamond**  
**Collapse**

# **Tikopia**

**A bottom-up society in which creative problem solving worked**

# Tikopia



**A bottom-up society**

## Tikopia

+ A tropical rain forest

+ A small island that could support about 1,200 people on 1.8 sq miles

**A bottom-up society**



**Tikopia solved two  
problems for 3,000 years:**

**A bottom-up society**

1) They created a food supply for 1,200 people



This was accomplished by:



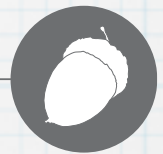
a. Maintaining rain forest on the steepest cliffs

**A bottom-up society**

1) They created a food supply for 1,200 people



This was accomplished by:



b. Converting flatter land to agricultural farms that mimicked the rainforest: a multi-story orchard. This process is commonly known as permaculture.

**A bottom-up society**

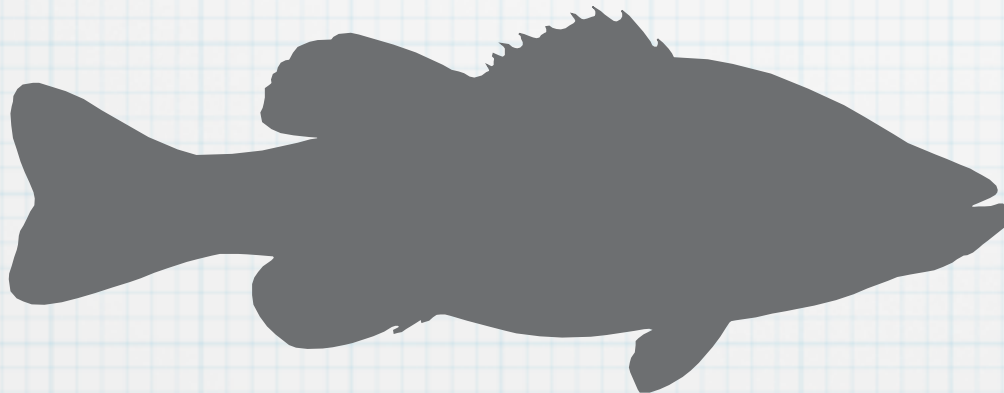


1) They created a food supply for 1,200 people



This was accomplished by:

c. They limited over-fishing



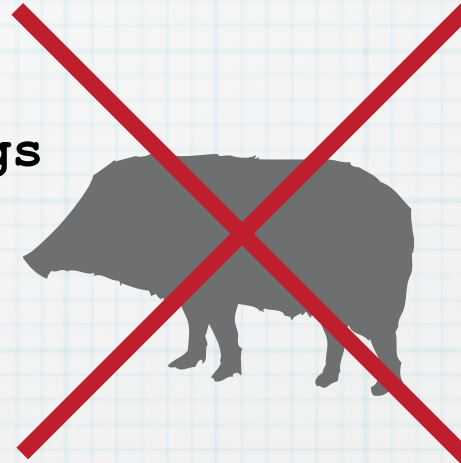
**A bottom-up society**

1) They created a food supply for 1,200 people



This was accomplished by:

d. They decided to eliminate the pigs that they had earlier introduced



**A bottom-up society**

2) They kept the population  
from rising above 1,200



**A bottom-up society**

They did not land on these solutions without first failing!



**A bottom-up society**

# Japan

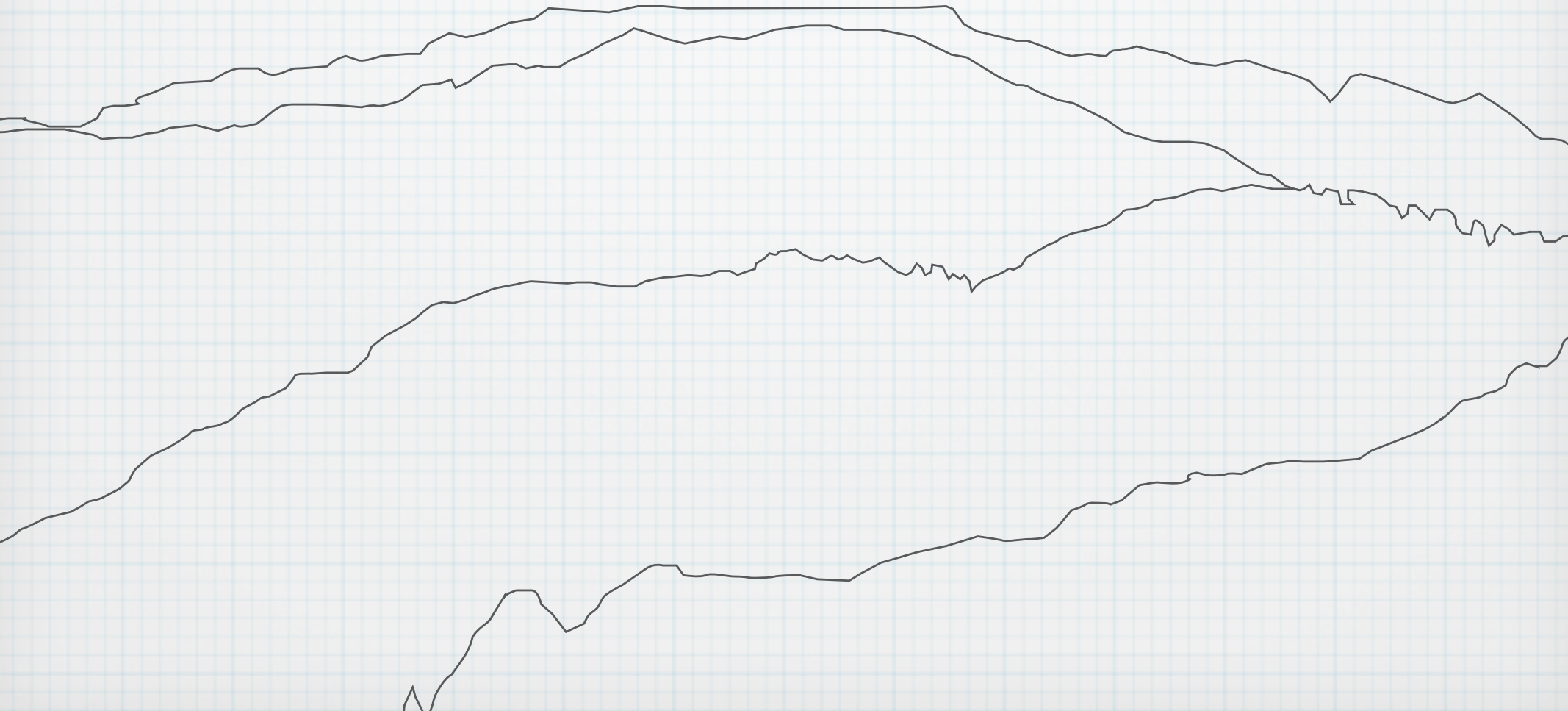
**A top-down society in which creative problem solving worked**

**A top-down society**

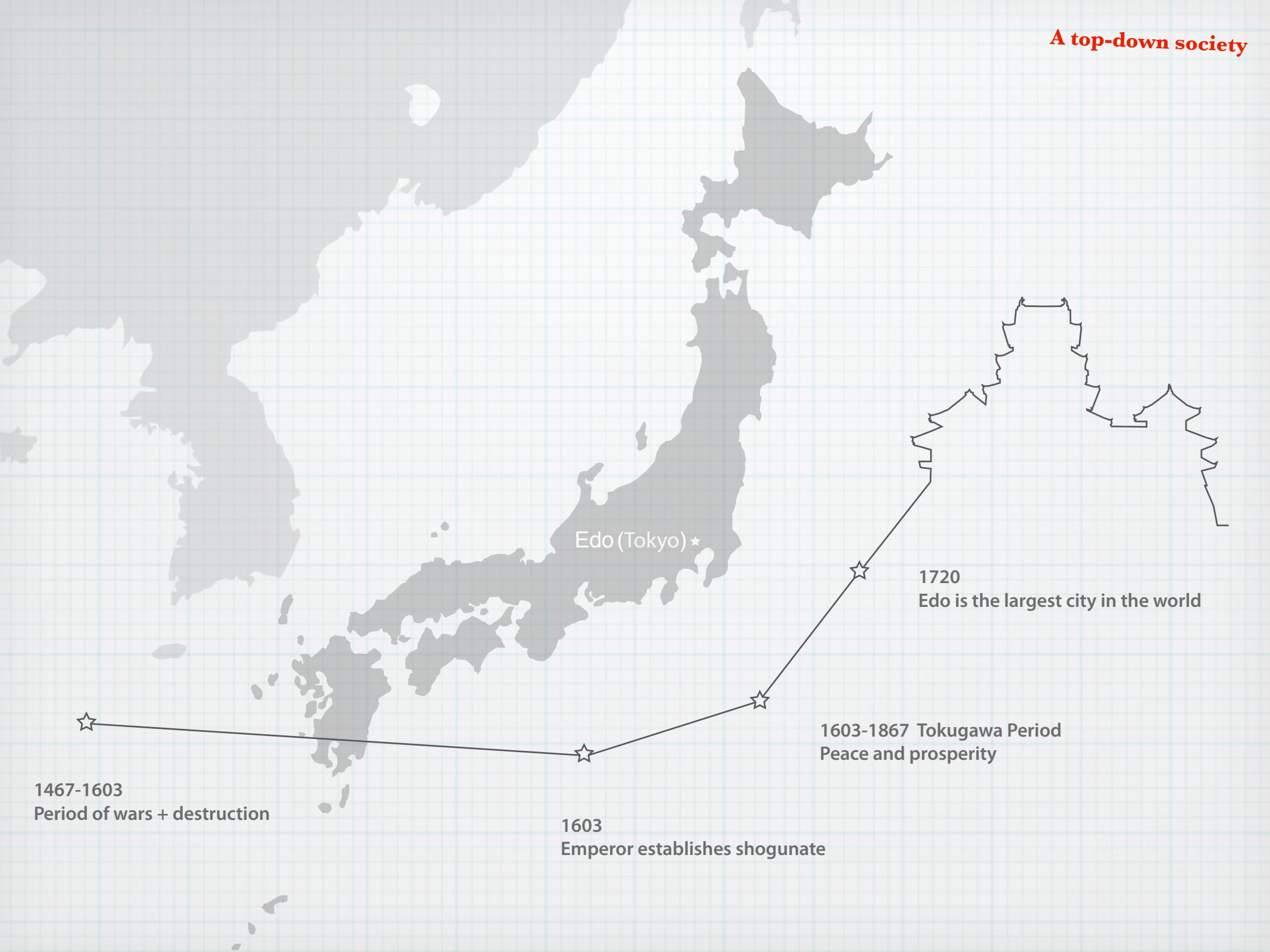


**A large cluster of islands**

**Comprised of mountainous terrain, originally Japan was heavily forested.**



**A top-down society**



1467-1603  
Period of wars + destruction

1603  
Emperor establishes shogunate

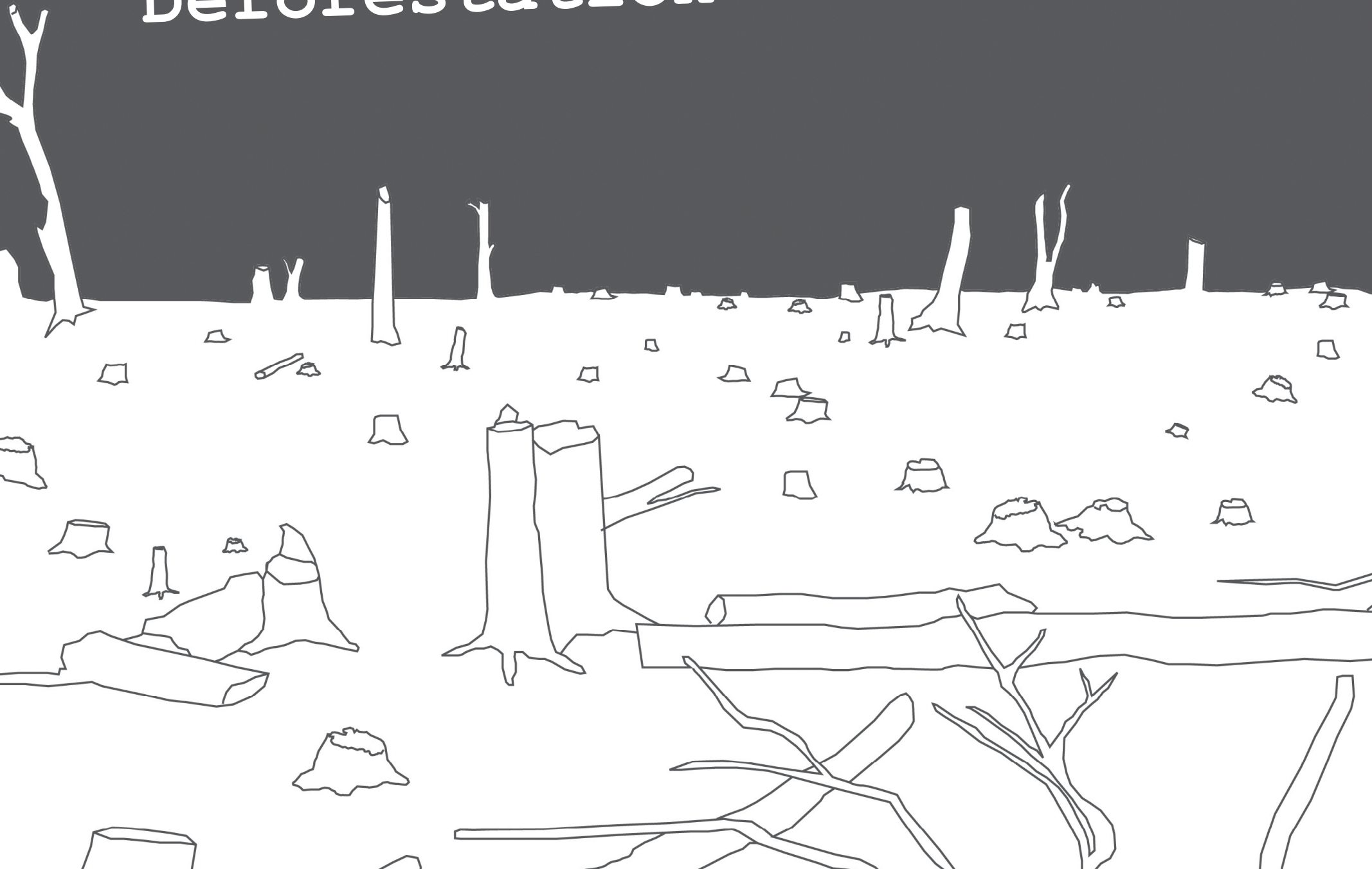
1603-1867 Tokugawa Period  
Peace and prosperity

1720  
Edo is the largest city in the world

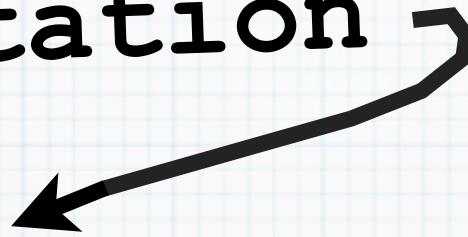
Edo (Tokyo) ★



# Deforestation



# Deforestation



Resulted in:

1. An increase in wildfires
2. Soil erosion in heavy rainfall
3. Flooding in lowlands
4. River siltation
5. Reduced crop yields because of shortage of fertilizer

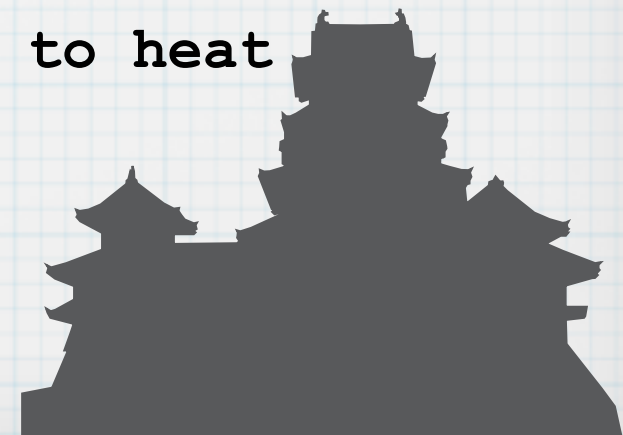
Successive shoguns over a 200 year period established an official ideology of limiting consumption by twelve means:

- 1) Increase reliance on seafood, reduce reliance on agriculture
- 2) New technologies, primarily for fishing
- 3) Establish controls to prevent over-fishing
- 4) Greater reliance on fish meal fertilizer
- 5) Hunting sea mammals for food
- 6) Import food from Hokkaido and Ainu



official ideology of limiting  
consumption by twelve means:

- 7) Use coal for fuel instead of wood
- 8) Use lighter weight wood construction
- 9) Fuel efficient cooking devices
- 10) Use small portable charcoal heaters
- 11) Take advantage of solar orientation to heat homes in winter
- 12) Reduce livestock

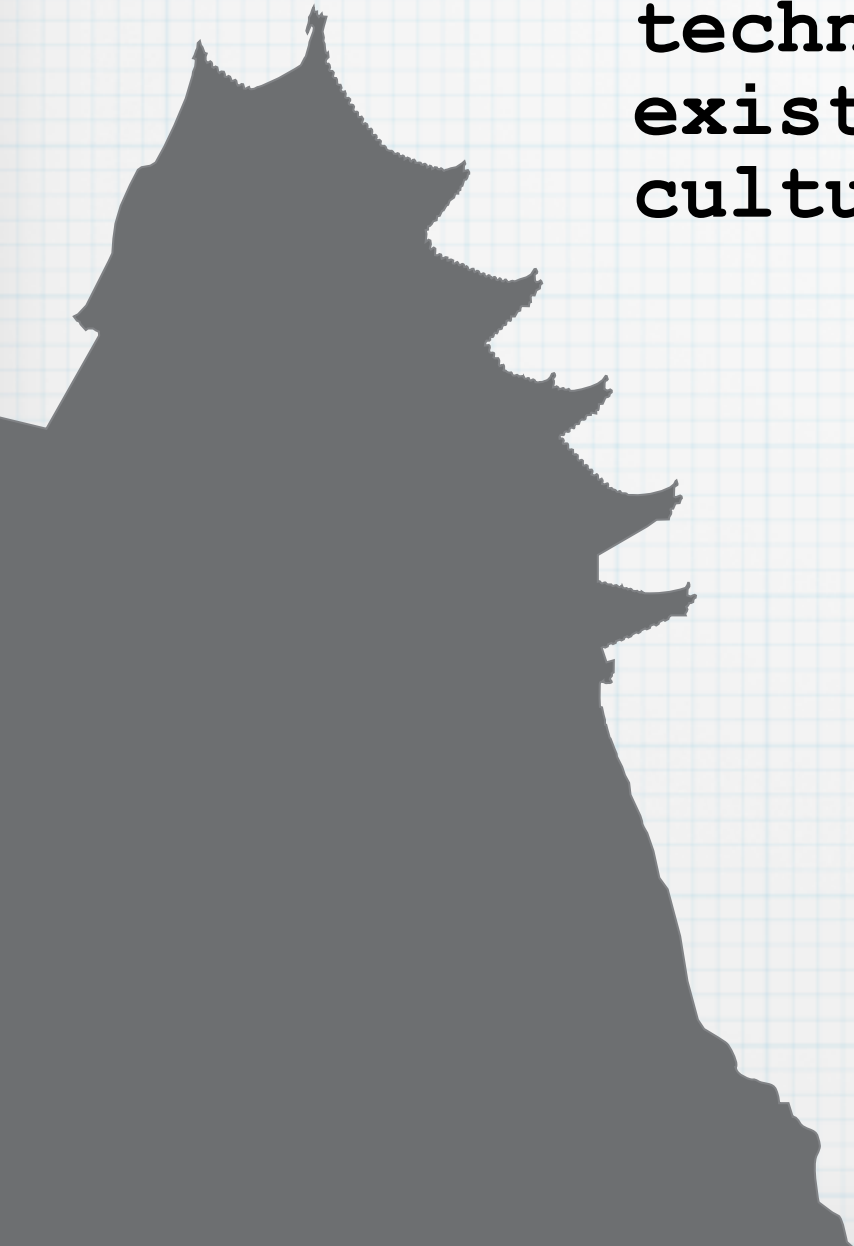


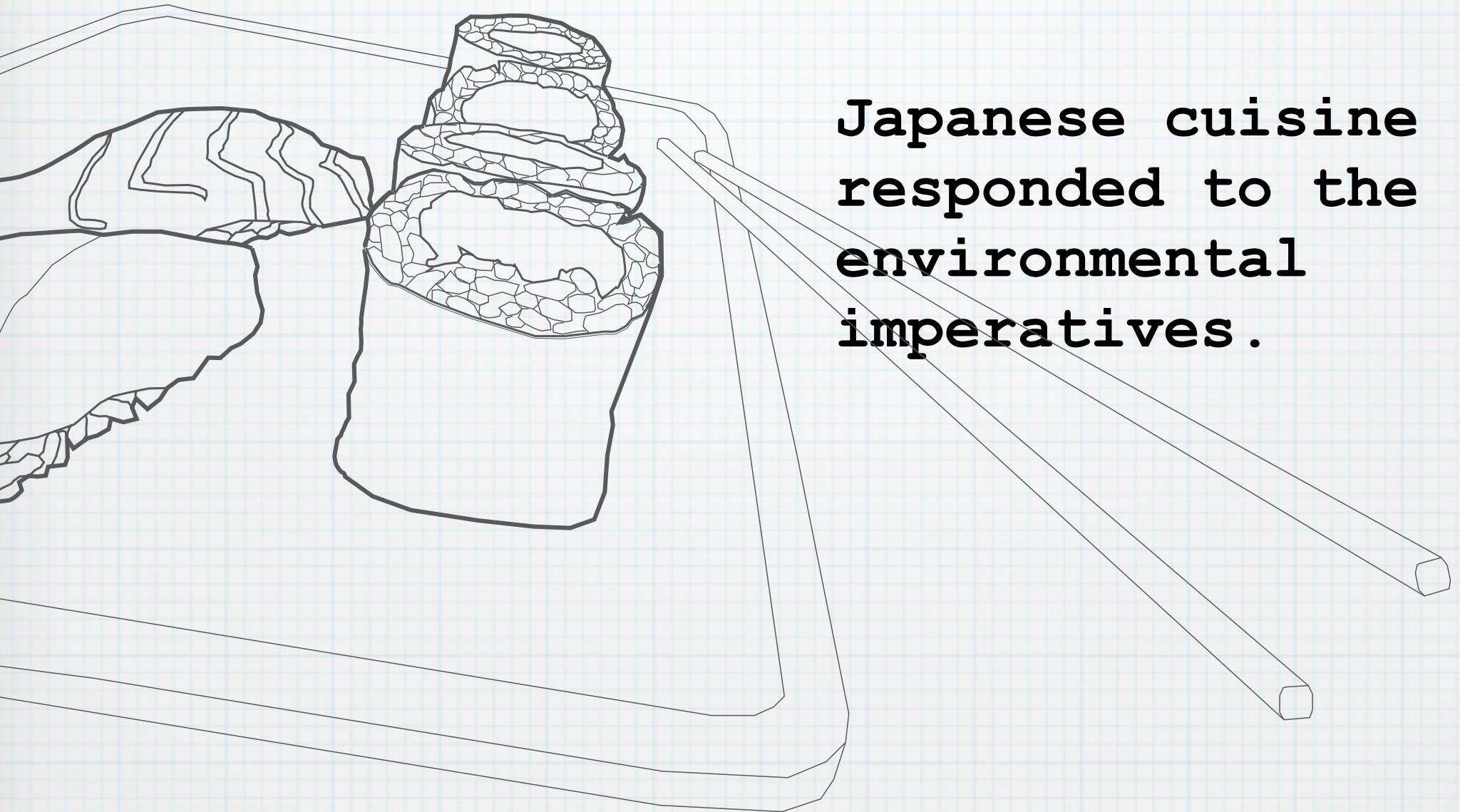
# ~~Deforestation~~

**Through a top-down social and political system the shoguns stemmed deforestation by:**

1. Limiting the wood that could be cut
2. Sophisticated silviculture

In Japan, environmental and technological creativity existed alongside social and cultural creativity.





**Japanese cuisine  
responded to the  
environmental  
imperatives.**



**Matsue Castle**





**Matsumoto Castle**



**Himeji Castle**



**Takahashi**



**Takayama**



**Matsue Samurai**



**Tsumago**



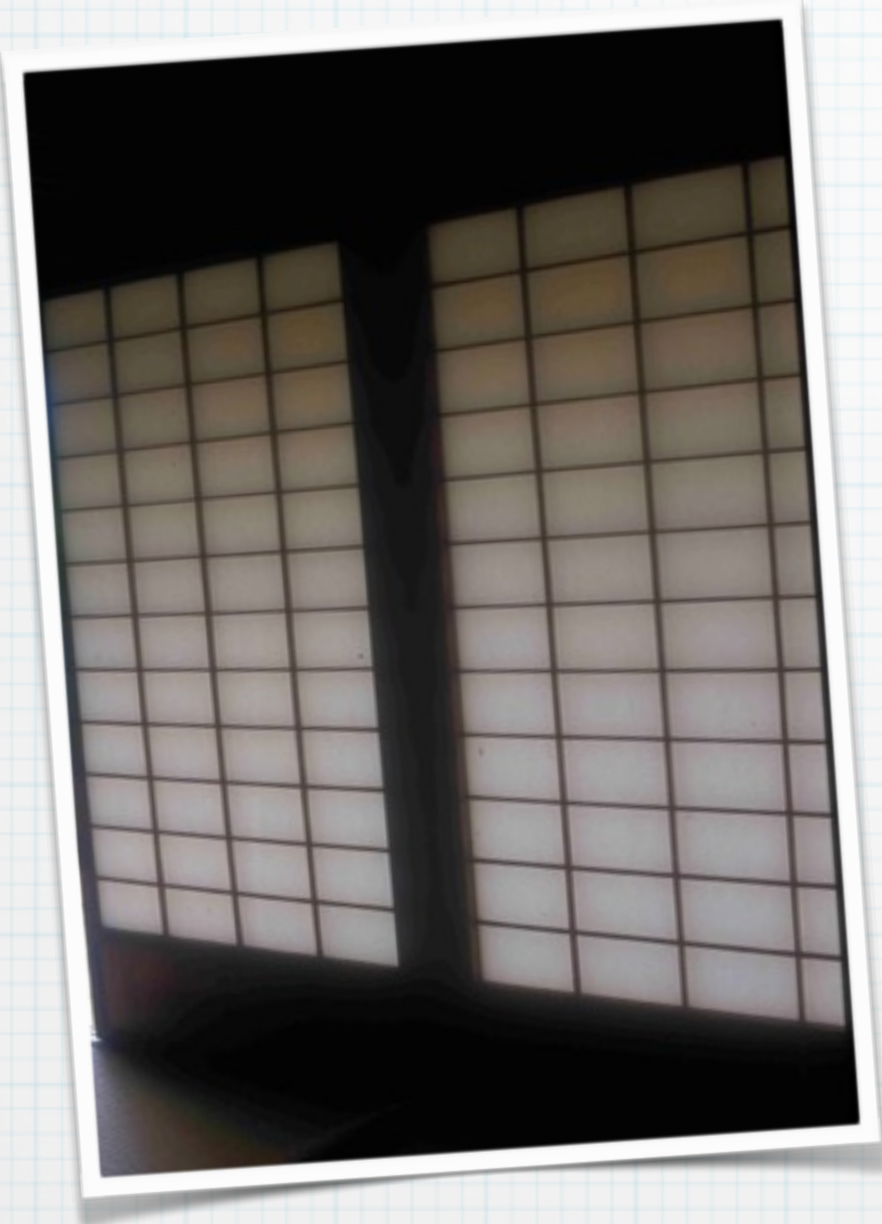
**Matsue Samurai**



**Takayama - Yoshijima Heritage House**



**Takahashi**



**Takahashi**



**Okayama Garden**





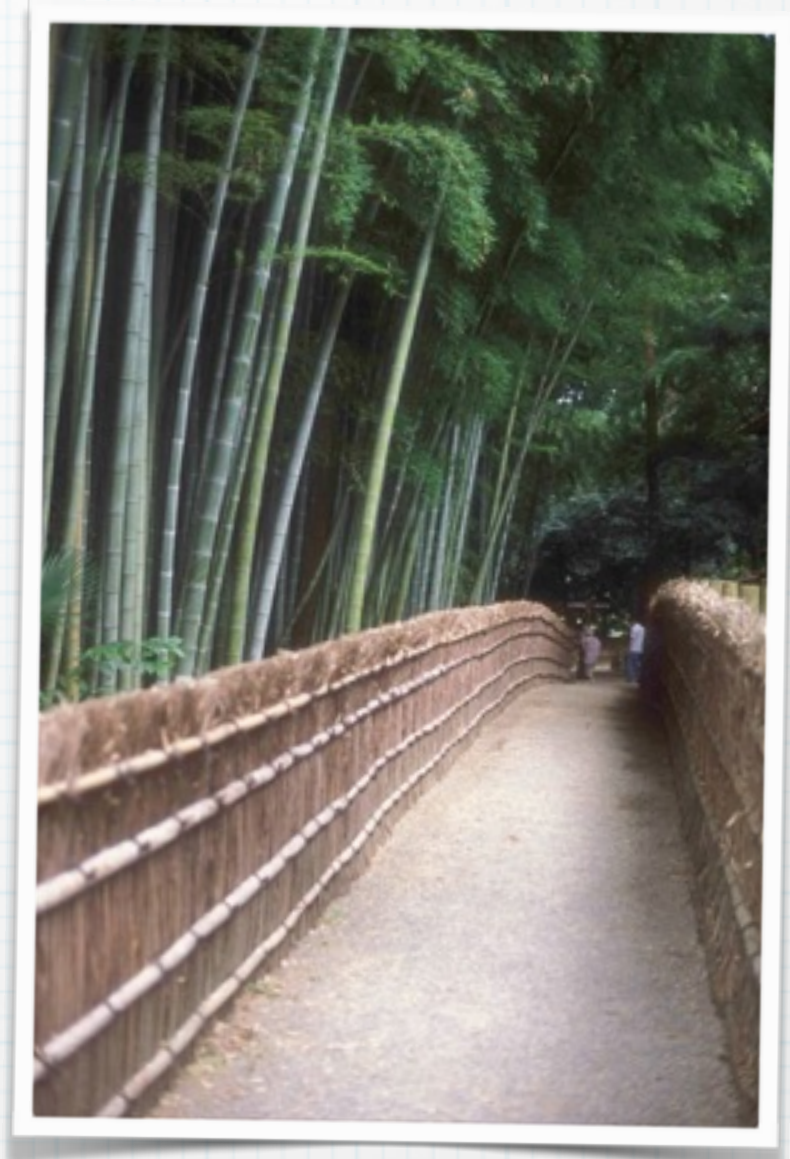
**Okayama Garden**



**Okayama Garden**



**Mito Garden**



**Mito Garden**



**Mito Garden**



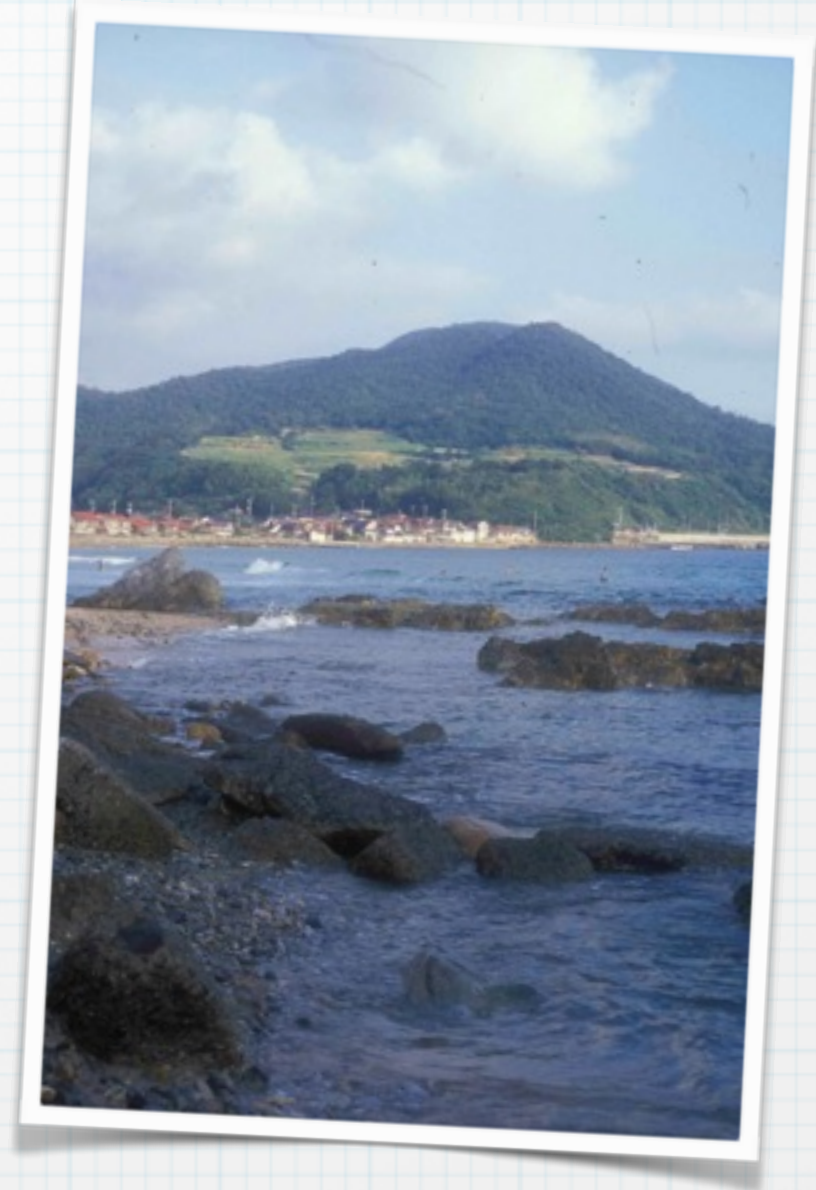
**Kanazawa Garden**



**Kanazawa Garden**



**Takahashi Garden**



**West Coast Land**



**Tsumago**



**West Coast Land**



Great advances in Japanese architecture and urbanism were fueled by environmental forces:

1. Spare wood frame
2. Delicate infill
3. Open interior spaces
4. Connection to gardens
5. Elaborate garden design

