

Collapse Study Guide

Collapse by Jared Diamond

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Summary

In *Collapse – How Societies Choose to Fail or Succeed* by Jared Diamond examines societies of the past and how they addressed the great challenges they were faced with in surviving severe and long-term damage to the environment, damage that was usually out of negligence or ignorance, brought on by the societies themselves. Diamond begins his work with a look at Montana.

Why Montana? Montana is a geographically large state with a small population. Diamond purposely offers the story of Montana to wake the readers up on two facts that cannot be ignored. First, Montana is suffering from the same environmental woes as did the failing societies of antiquity. Secondly, Diamond uses Montana as an example of a state in a first world nation because it is small and has a low population. Extrapolating Montana's issues to large urban areas like Los Angeles, New York City or London the unstated comparison is obvious. If Montana is experiencing such dire threats to its societies, how could these huge advanced population centers be faring?

Diamond then tells the story of societies of old and how many failed although some, facing the some conditions and environmental concerns, were able to succeed. It's about choices made and anticipating problems, recognizing them, finding solutions and fixing the problem. This is a recipe for success in the face of disaster, a recipe that most of the accounts Diamond shares in his book chose to ignore.

There is a mystique about Easter Island. Why did the islanders carve hundreds of huge stone statues, and beyond that how did they move the statues some of which weighed nearly one-hundred tons? They had to be bright and resourceful to accomplish feats that seem impossible, but why did their society advance and why did they vanish? Like other failed cultures, they depleted their woodlands, ruined their soil and water and were unable to meet the food demands of a growing population. The fate of two other Polynesian Islands – Pitcairn and Henderson – also failed for apparently similar problems.

Diamond also describes the downfall of the Anasazi society and the collapses of the Maya culture that was advanced in many ways. He tells of the failure of the Norse Vikings on Greenland and Vinland while the Inuit succeeded there. The Iceland Norse, who were determined to adapt to their new surroundings, were able to pull themselves out of a dark hole before they vanished like their brother Greenland settlers who clung to their European roots.

Modern societies have failed or are failing as well. Rwanda experienced one of the most devastating events of current times in the genocide in which the Hutu wiped out the Tutsi. Haiti and the Dominican Republic share the island of Hispaniola. However, the Dominican Republic has made better choices about its environment and is faring much better than Haiti, one of the poorest countries in the world and one that has little hope for recovery. Environmental abuse is not limited to third world countries. Australia is struggling with a low water supply, land degradation and the tyranny of distance. China



is abusing the world's environment with the pollution it spews into the air and waters that travel around the world.

Diamond ends *Collapse* with warnings about the future that were proven deadly in the past. He offers solutions that can turn crises around when big business, governments and the public at large agree to be dedicated to the protection and preservation of the Earth and its valuable resources.

Chapter 1: Under Montana's Big Sky

Summary

Montana is a modern representation of a small society with a fragile environment like those in the past which include Polynesian, Anasazi, Maya, Greenland Norse among others. By understanding what communities in Montana are dealing with more understanding can be gleaned about societies in the past which suffered from environmental damage. Montana's suffering from environmental damage is far less than that experienced in large urban areas.

Environmental disadvantages limit Montana from growing crops and raising livestock. Hunting and fishing is a recreational pursuit in modern Montana. The fur trade that once thrived is gone; mining and logging and agriculture is on the decline. Tourism, recreation, retirement living and health care represent the industries that are in the rise in Montana. Although mining is an important industry, the toxic runoffs from the metals that include copper, palladium, platinum, zinc, gold and silver have created an environmental crisis. Some mines that will continue to produce toxic waste virtually forever are abandoned leaving no one responsible for them.

The futures of both the logging and mining industries in Montana are uncertain. Deforestation caused by the logging and burning of Montana forests is another constant threat to the environment. Forest fires have increased in the timberlands in recent years due in part to climate change. An over abundance of saplings that serve as fuel for fires have not been appropriately thinned out by the Forest Service because Congress has failed to fund the process because the price tag is over \$100 billion to properly purchase the western forests. The "let it burn" policy is not popular among Montanans and protests were at a fever pitch when the 1988 fires in Yellowstone National Park were allowed to burn. However Montanans also dislike thinned out forest preferring to view thick, dense forests.

Montana's soil suffers from exhaustion from overuse and from erosion from overgrazing, harmful weeds, logging and forest fires. Some who raise livestock over graze their land in hopes of recouping investments or renting part of it to tenants for a quick profit. Two-thirds of Bitterroots watersheds are eroded or at risk of erosion.

The lack of water is a serious problem in Montana. Decreasing amounts of water is due to climate change. Montana is becoming warmer and drier. Snow is being limited to higher and higher altitudes. Large areas of farmland have been abandoned. The most notable sign of global warming's destruction in Montana is in Glacier National Park. There were 150 glaciers in the 1800s compared to 35 that still exist. It is estimated that there will be no glaciers in the park by 2030. Such destruction to the snow pack impacts irrigation and well water. All the environmental challenges that face Montana has drastically impacted the state's economy and therefore its people.



It is up to Montanans to solve the problems but there are many disagreements on how to proceed. Conflict is inherent in the chasm that exists between the very rich and very poor in the state. Some individuals focus on their own wants and needs and profits rather than solutions that would benefit their community and state. Also at odds are “old timers” who ascribed to the former three tiers of Montana’s economy – mining, logging and agriculture and “new comers” who support moving Montana to a new horizon. Old farmers loved the land and farming and only wanted to grow enough to feed their families. Montana is in a fragile state. It cannot support its own economy depending instead on funds flowing in from other states of the federal government.

Analysis

In this first chapter, Jared Diamond chooses to focus on a current-day potential crisis in a state that has a huge area but a small population. He wanted to demonstrate that if Montana is facing environmental crises, what then could be the state of large cities like Los Angeles, New York City and Miami?

Diamond chose to start off his book with an area that is in the grasp of current-day environmental challenges which he promises to follow with descriptions of societal collapses that occurred in antiquity. The reader, therefore, will be able to make comparisons to the cultures of the past that remarkably faced many of the same challenges that mankind faces today. It’s a wake-up call... if societies from the distant past that thrived for centuries collapsed from their mistreatment of their surroundings, couldn’t it happen now?!

Diamond sets the tone in this first chapter and describes the main demons that are endangering our environment and therefore man’s future. He intimates that references to these same problems will be made repeatedly throughout the work. He goes to great effort to draw in the individual and what they can do to help the environment – something that will draw in most readers.

Vocabulary

grandeur, panorama, microcosm, salutary, pristine, euphemism, habitat, permeability, adjudicated, onerous, aquifer, homogenous



Chapter 2: Twilight at Easter

Summary

Rano Raraku is the volcanic quarry on Easter Island. The quarry is an eerie sight; it is where the huge gigantic stone statues were carved. There are 397 stone statues found around and inside the volcano. They are all of torsos of men. Most are 15 to 20 feet in height; the biggest one is 70 feet tall. The statues weigh between 10 to 270 tons. There are 97 more statues that can be found scattered about on the roads around the crater. There are 300 stone platforms along the coast and inland some of which supported 393 more statues that crashed and were broken up years before. The statues are in various stages of completion; some are still part of the stone it was being carved from. They seemed to have been suddenly abandoned. Some statues appear to be defaced and purposely damaged. How the huge torsos were moved is only speculation. Why they were abandoned and defaced is unknown.

Easter Island is an ecological disaster that happened in complete isolation. The islanders were Polynesian which Captain Cook confirmed during his brief visit to Easter Island in 1774. They spoke in a Polynesian dialect related to Hawaiian and Marquesan. Their tools and implements were Polynesian and their skulls have characteristics of Polynesian skulls. The Polynesians were expert in navigating and sailing their canoes and there is archeological evidence that traces the routes of their expansion throughout the Pacific triangle that is comprised of Hawaii, New Zealand and Easter Island. There is evidence that this expansion was planned and not random. The Polynesians who made it to Easter Island probably came from the Polynesian islands of Mangareva, Pitcairn and Henderson according to the similarity in tools, implements and statues.

It is estimated that Easter Island had a population of between 6,000 and 30,000 people. There is evidence of a farming structure that included an irrigation system that was intense and vast indicating that the population was probably north of 15,000. The island was divided into territories by the resources located within each slice. Resources considered valuable were the stone, timber, coral, red ochre and paper mulberry trees.

Zoo archaeologist David Steadman identified the island as home to six bird species including a heron species, rails, parrots and owls. There were 25 seabird species that nested on the island. The lack of predators on the island made it an ideal home for these species. The Common Dolphin has been identified as the main diet source of the islanders. There is evidence that they also ate rats and birds. The diets of later generations of islanders were nearly devoid of dolphins and consisted of in-shore fish. Land birds had become extinct ultimately resulting in the absence of any native birds on the island. The number of nesting seabirds also declined.

The deforestation of Easter Island is an example of one of the most extreme in the world. All its trees disappeared causing many species to go extinct. The damage to the soil continued over centuries. The disappearance of wood put a stop to canoe building.



Without canoes, the food supply was greatly depleted. Only fish that could be caught close to shore remained part of the diet. The bird population had declined. Rats were the only staple in the islanders' diets. Deforestation caused erosion which had a deleterious impact on crop growing. Starvation set in followed by population decrease and then finally cannibalism.

There has been a resistance among islanders and scholars to recognize that the environmental collapse of the Easter Island of yore had been self-inflicted. The islanders prefer to blame the decimation of early Easter on cyclones and European visitors. But forensic evidence supports the theory that the damage was done before the arrival of Europeans. Climate change may have contributed to the collapse of the environment but was not the chief cause.

The inhabitants of most Pacific islands chopped down their trees. Why did Easter Island pay such a huge price for the same practice? Easter had an extremely fragile environment and was more vulnerable to deforestation than any of the other Pacific islands. Easter's over-exploitation of resources, human activity and its isolation that made escape next to impossible were the main causes behind the island's environmental collapse. Had there been a way out for people, the population would have declined and resources would not have been stripped so completely.

Analysis

The first society that Jared Diamond focuses on is Easter Island. He describes the many mysteries of this ancient society including the huge stone statues that had been carved from stone and that are dotted about the island. What significance they had and particularly how the islanders were able to haul these statues – some of which weighed almost 100 tons – around the island remains largely a mystery. But for the purposes of his book, he draws the reader into the mystery of not just the statues but why an obviously flourishing society suddenly collapsed and virtually vanished.

Easter Island faced the same problem as modern societies are confronted with today. Their wholesale mowing down of their woodland was done without the forethought of where they could turn on an isolated island for more timber when there were no more trees. It's a signal to nations, governments and the public at large of today. Even renewable resources like wood have to be protected and removed intelligently with a plan for the woodland's recovery.

The author focuses on the islanders of Easter because they were obviously innovative and resourceful or else they could have never erected and moved all those statues and platforms around. Yet they didn't recognize that when they chopped down that last palm tree that there would be no more timber left to build boats from. When boats disappeared from the society, they could no longer fish off shore and their diets became more limited. When the woodland was decimated, they couldn't grow trees or crops on the land with any success because deforestation caused soil erosion which led to a soil bereft of nutrients.



The author demonstrates with the example of Easter Island how damage to one element of the environment impacts others.

Vocabulary

incredulous, postulated, copious, exacerbated, ostentatious, predation, proliferation, reconnoiter, paroxysm

Chapter 3: The Last People Alive: Pitcairn and Henderson Islands

Summary

The tropical island of Pitcairn was rich in resources. It was the island that the mutineers of the HMS Bounty fled to in 1790. It was empty and abandoned – just what the mutineers needed for a hiding place. The men found evidence of an ancient Polynesian culture that existed on the island. Pitcairn and Henderson are two islands that are the least accessible in the world. Henderson apparently was also home to an ancient society.

Archaeologists have determined that the end of these societies was due in large part to environmental collapse. The island of Mangareva the trading partner of the islands was located hundreds of miles away. Its environmental collapse was the cause of the demise of the other two islands. These three islands are the only islands in Southeast Polynesia that are inhabitable. The three islands were inhabited around A.D. 800. The population center of Polynesia is in the islands of the east. Of these islands Mangareva possessed the most natural resources and could have supported a large human population. There was a large lagoon that was filled with fish and oysters; streams with fresh water; and forested areas. The soil and climate was conducive to raising a variety of crops. The island could have supported as many as several thousand people. The only thing it lacked in the mind of Polynesians was high-quality stone.

Pitcairn, located 300 miles to the southwest, was rich in natural stone. The first travelers from Mangareva had to be delighted with the resources they found. Although Pitcairn had some trees and fresh water streams, it was too small to support agriculture and, therefore, could support only a small population, not greater than one hundred people. When the population grew in 1790 from its original 27 settlers to 194, the island could not support the growth and many had to be evacuated.

Henderson was larger but is the most remote from East Polynesia. The island is basically a coral reef and does not possess rock, streams or other freshwater resources. Soil is scarce and is lodged between limestone deposits. There are no tall trees on the islands which would have been necessary for making canoes. Henderson has a reef that is filled with lobsters, crabs, octopus and other fish. It is the only Polynesian island that has a turtle nesting beach. There are many birds that are indigenous to the island. Despite its many assets, it was not a locale for sustaining human life for a lengthy period of time. It is estimated that only 82 people inhabited the island at one time. Fish and birds were major parts of the islanders' diets. There are only a few remnants of any structures that were erected. Many of the islands were cave dwellers. Settlers apparently introduced some Polynesian plants and crops onto the island.



Mangareva was the most habitable of Southeast Polynesia while Pitcairn was too small and Henderson was far from ideal for habitation. Pitcairn had stones and Henderson food in the form of seafood and birds. There is reliable research that revealed that the trade of raw materials beginning about AD 1000 was robust among the three islands. Another reason for transoceanic travel between the less populated islands and Mangareva was the potential partners for marriageable age islanders who were not related to them. Incest was taboo. Long distance travel was not an issue. Mangareva islanders travelled to islands much further away than Pitcairn and Henderson including their The Marquesas which were rich in basalt.

Trade among the Polynesian Islands ceased around 1500 according to fossil evidence. Henderson, the most remote and least blessed with natural resources, survived by their wits after contact with Pitcairn and Mangareva ceased. In 1606, a Spanish ship came ashore and found no one. Pitcairn's population also disappeared but much later but at least by 1790. Disastrous man-made environmental changes on both Pitcairn and Mangareva were behind Henderson's demise. These changes caused the massive extinctions of plants and animals necessary to sustain human life. Deforestation and erosion were key elements in Mangareva's decline. The society collapsed into civil war, starvation and cannibalism. Travel had been eliminated due to the lack of large trees from which to craft canoes. Environmental changes on both Pitcairn and Henderson contributed to their decline. This environmental damage that led to conflicts and the lack of canoes ended inter-island trade leaving the vulnerable islands of Pitcairn and Henderson at great risk. The population ultimately died out. Did they die in conflict or mass murder, mass suicide or was their extinction gradual? Although diminished, the population of Mangareva survived because it was so much larger in number.

Analysis

With the stories of the failed societies of Pitcairn and Henderson Islands, the author provides yet another example of how damage to the environment of one nation impacts another even though they may be hundreds or thousands of miles apart.

There are three islands of Polynesia that are actually the focus of this chapter. The largest of the islands was located closer to the main Polynesian Islands. The large and populous island of Mangareva was a trading partner with the more remote island of Pitcairn and to a lesser degree the even more distant Henderson Island.

The islands were similar in climate and environmental elements; however, each island had resources that were needed by the other islands. Mangareva because of its positioning closer to other islands was more independent yet they entered into trade agreements with the two distant islands. When Mangareva's society began to falter from the abuse of its environment, it began to retreat from trade relations with Pitcairn and Henderson. Since those two islands were totally dependent on Mangareva for vital resources, their society also began to fail and eventually they both collapsed. Mangareva withstood its troubles and was able to survive because of its location, larger size and population.



The story of these three islands demonstrates how the collapse or decline of one society can cause the death of another and how destruction of the environment has tentacles. Also this chapter enlightens the reader who may not understand why trade is an important to the success of a nation.

Vocabulary

archipelagoes, ingenious, anomalies, susceptible, deforestation



Chapter 4: The Ancient Ones: The Anasazi and Their Neighbors

Summary

In Southwest America there was not just the collapse of one culture; rather, it was the demise of a series of cultures. These Southwestern cultures suffered from regional decline, debilitating reorganizations and wholesale abandonments at different locations and periods. This decline occurred before Columbus discovered the New World. The Anasazi did not vanish but blended into other Native American cultures such as the Hopi and Zuni.

One of the main causes of the regional collapse is that the U.S. Southwest has a very fragile environment in which agriculture does not thrive. Low rainfall, poor soil condition and slow forest re-growth all contributed to the region's decline. Erosion and major droughts also played havoc with the Southwest U.S. which is an example of the debilitating impact of human activity and climate change. Archeologists and paleobotanists have been able to capture important elements of these cultures and changes to them.

A vast irrigation system, the most sophisticated in the Americas since the Peruvian system, was constructed in the region so that farms at lower altitudes could be adequately irrigated. The Mimbres adopted the more conservative approach of planting atop the water tables. The Mimbres culture collapsed when their population grew and food demand increased.

Other Native American groups moved from soil that was spent after several decades to new land where the soil was more conducive to crop growing. But as populations increased, there were fewer and fewer such areas available. The solution adopted at Chaco Canyon was distributing food from crops with good yield to those groups whose crops did not survive the elements. The system was not successful due to the complex political and social system. The Hopi and Zuni had the most success with agriculture; they planted and lived near reliable sources of water and to created self-sufficient settlements that were small enough to face periods of adversity.

The abandonment of the largest Anasazi sites in Chaco Canyon in northwestern New Mexico has received the most scrutiny. These societies flourished between A.D. 600 and the next five centuries but disappeared between 1150 and 1200. The region in modern times remains virtually uninhabited. The first inhabitants lived in one level underground pit houses. Through the centuries, these grew to the familiar many-storied pueblo homes of the Southwest. At the time the area had a more favorable environment than in most recent centuries. The Anasazis benefited from the natural advantages that the region offered. The major challenges facing early tribes was water management and deforestation.



Pine needles found in packrat middens indicate that when villages were first formed, they were built among forested areas. In later times, pine needles disappeared from the middens signaling the role that deforestation played in its collapse. The climate was too dry to sustain the regrowth necessary to keep up with population growth. After the trees disappeared close to settlements, Anasazi were forced to haul large logs from mountainous areas many miles away. Despite growing problems, the population continued to increase to perhaps at least 5,000 people. However, many of the settlements became non-self-sufficient and were forced to trade with others. Chaco Canyon imported much of their goods but had nothing to export. The Chaco society blended with other societies in the region. It became a mini-empire that was divided between the elite and peasantry.

The last structure built in Pueblo Bonito was built in the decade after 1110 appeared to be one in which trouble-makers were confined. There were signs of cannibalism, war and the burning of villages. Civil unrest was the direct result of environmental and population problems. Tree rings indicate that a drought occurred around 1130. It was devastating to the Chacos because of their dependence on outlying societies that also suffered from the drought and no longer able to supply the resources that the Chacos needed. The Chaco Canyon region was abandoned between 1150 and 1200 and remained so until Navajos occupied it 600 years later. Many died of starvation or illness, others were murdered and cannibalized and a small number fled.

Other societies in the U.S. Southwest also collapsed but for varying reasons. Salinization from irrigation agriculture hurt the Hohkam. Cold temperatures affected the Mesa Verdeans and Mogollon who lived at high altitudes. Dropping water tables and soil exhaustion were the downfall of other societies. The common theme that ran through all of the collapses was that these societies lived in a fragile environment without long-term solutions to the problems they faced. Four human impacts contributed to the collapses: deforestation, arroyo cutting, interdependence and political and societal factors. Chaco Canyon was abandoned because of man's impact on the environment and because of severe drought. The population had outgrown the region and zapped it of its resources. The drought came in and finished the job.

Analysis

In this chapter, Jared Diamond takes a close look at the ancient society of Anasazi and other Native Americans who lived in the U.S. Southwest long before Europeans came to the New World. These tribes lived and thrived in these areas until their societies faced sudden and complete collapse.

The same enemies that put modern nations at risk were the culprits who eventually did in the Anasazi society. Archeologists have found evidence that the region contained woodlands at one time and evidence that the woodlands had been destroyed by overuse. Deforestation leads to other environmental problems including the destruction of the soil which strips the soil of nutrients and unusable for agriculture. Without the

ability to grow crops, the demand for food overwhelmed the society. Deforestation also destroys the habitat of animals that the societies hunted for the protein in their diets.

Without a written record, scientists can only speculate about what happened to missing societies like the Anasazi. Archeologists found signs of war, drought, the burning of villages, starvation and even cannibalism.

The area that these ancient societies lived in and survived for centuries was completely destroyed and is has not been inhabited in modern times.

Vocabulary

paucity, apogee, serendipitous, dendrochronology, domesticable, retrenchment



Chapter 5: The Maya Collapses

Summary

The Maya ruins draw tourists and are currently surrounded by healthy foliage and are remote from modern civilization. The Mayan society was once the most advanced Native American civilization in the Americas, prior to the arrival of the Europeans. Currently the abandoned Maya cities are considered “pure” archeological sites because there was nothing built over them. The Maya cities were hidden by forest growth and were only recently discovered. Forty-Four sites and cities and, judging from their art and architecture, it was obvious that the cities had been inhabited by an advanced civilization.

Scientists have been able to study the Mayan culture much more thoroughly than other collapses societies because of the pristine condition that the abandoned civilization had been left in. Unlike other smaller cultures that collapsed, the Maya civilization was large and advanced and located in an environment that had some problems but was not in the least fragile. The Maya civilization collapsed due to damage to the environment. The environment suffered from deforestation and erosion; climate change; drought; hostilities among its people; and, political and cultural issues. The Maya cities were surrounded by a seasonal tropical forest with varying rainfall amounts. Drought was a recurring problem in some of the regions. Maya agriculture included crops domesticated in Mexico like corn and beans. Corn was 70 percent of the Mayan diet. They had domestic animals like dogs and turkeys, fished and hunted deer. Population centers were surprisingly dense with estimates of between 250 to 1,500 people per square mile. The Mayans devised a methodology for increased agriculture to match population swings.

The Mayan diet was lacking in adequate protein. The heavy humidity in Maya precluded a lengthy storage of corn. The Maya had no large animals like horses or donkeys for overland transportation. Humans carried whatever had to be transported which limited military campaigns in length and duration. This factor could have been responsible for keeping the society politically divided among the small kingdoms as opposed to joining forces to create a large military.

The Classic period of Maya civilization began around A.D. 150 and lasted through about A.D. 909 when it collapsed. Erosion of the hillsides of Copán, a Mayan site in modern-day Honduras, was caused by the wholesale cutting down of trees. Trees were used for fuel and construction. The people were forced to move to the valley floor causing more competition for the food that was produced there. The king was probably held responsible for not producing the rain and prosperity that he had promised. There is evidence that the last Copán king ruled in A.D. 822 and that his palace was burned in A.D. 850. The general population began to dwindle until there were no more signs of human life in the Copán Valley around A.D. 1250.



In addition to the large classic collapse, there were a series of small collapses leading up to and following the classic collapse. Those areas surviving the classic collapse were in the north and coastal lowlands where water was plentiful. The population in the south had all but disappeared. The decline of the population was slower than in other collapses. There was an uneven collapse happening in stages across the entire civilization. Between 90 and 99 percent of the population disappeared after A.D. 800. Warfare and drought had a hand in the collapse of Maya.

Maya was not a peaceful civilization. There was fighting among the different factions for centuries over resources. There were civil wars and conflicts with the Spaniards. Massive fortifications have been discovered by archeologists and translated writings have contained boastful claims of conquests. Kings were taken captive and tortured in the worst ways than can be imagined. Samples deep in the sediment confirmed that the area suffered from devastating droughts leading up to Maya's demise.

The main collapses are estimated to have occurred in 810, 860 and 910 which coincide with the dates of severe droughts. The southern lowlands were most impacted by the Classic collapse because of overpopulation and the most challenging fresh water problems. The south lost 99 percent of its population during the Classic collapse. Central Petén at its peak had a population of between three and fourteen million. When the Spanish arrived there were only 30,000 people. Some survived by fleeing to the northern Yucatán peninsula. However, the vast majority did not survive. By 1714, there were only 3,000 left in Central Petén. Today the area has recovered its population to 25,000 but still suffers deforestation and erosion.

The Mayan collapse was due to overpopulation that caused a depletion of resources; deforestation and erosion; increased fighting and warfare; drought; and poor leadership. There are similarities between the collapses of ancient societies in spite of their geographic locations.

Analysis

The Maya society was the most advanced culture in the Americas during its long history. Their collapse was a complex one that was actually a series of collapses that took place over a hundred years. Despite the fact that there was no written records per se, the Maya cities were found largely intact with nothing built over them. This allowed archeologists and other scientists the advantage of having a clearer view of what might have occurred and why the society failed and vanished.

Just as in other failed cultures, the same villains played havoc with the Maya environment which suffered from deforestation; soil decimation, climate change; drought; wars as well as political and cultural issues all of which in the end were apparently insurmountable.

The Mayan collapse is different than those of some of the other ancient societies. They had no means of transportation – no wagons or large animals – which weakened their



military and made them more vulnerable to enemies. Also, their collapse took place over a century which should send up a red flag to current nations that are experiencing collapse in just some areas and feel that other parts of their environment is just fine.

Vocabulary

deciphered, climatologist, hovel, peripheral, fallow, stratified, exacerbated, anthropogenic



Chapter 6: The Viking Prelude and Fugues

Summary

Vikings lived on Greenland for five centuries but then vanished leaving the land to the Inuit who were able to better cope with the rugged environment. The early settlement of Greenland is an example of how the choices and strategies made to deal with environmental challenges can succeed or fail in the same land and at the same time by choices made.

Researchers know more about the environmental problems in Viking Iceland and Viking Greenland than those in other failed societies because of written records and because there are still descendants of the Vikings. The Vikings in Iceland damaged their environment, suffered from climate change and contributed to their own collapse. Viking Greenland had a similar experience but also dealt with adversaries, the native Inuit. There was a “push” and “pull” that drove the Vikings to expand overseas. The push was the population explosion and lack of opportunity; the pull was the promise of the beautiful uninhabited lands that they had discovered.

The Vikings brought crops and domestic animals to Greenland and Iceland; however, they did not adapt well to the new climate. Cows and pigs nearly died out while sheep and goats flourished. Crops did better in the southern regions of Greenland. Fish became a larger part of the Viking diet. They hunted seals, reindeer, moose and waterfowl.

Settlers in Greenland and Iceland were not as successful in controlling erosion. Greenland and Iceland were faced with soil that was vulnerable to erosion, shortened growing seasons, long sailing distances and on Greenland, there were combative locals. There were active volcanoes on Iceland. Today Iceland is the most ecologically damaged country in Europe. Most of its native trees and plants have been devastated and fifty percent of the original soil has been eroded. The early settlers in Iceland were confronted with many problems due to its fragile soil. They had been accustomed to the robust soil in Norway and Britain. These early arrivals exhausted the soil such as it was in a time span of between one year and two decades.

Iceland's soil is fragile and slow to recover due to the ash layer from frequent volcano eruptions. This light ash covering serves as a rich fertilizer but is so thin and light that it is carried away by a strong wind once again exposing the exhausted soil. Vegetation grows slowly because of the island's cold climate which also makes the soil vulnerable to erosion.

Colonization began around 870 and ended by 930 when all available land was taken. Sheep were the only domestic animals that the islanders were successful in raising.



Icelanders made up the rest of their diet with wild game and fish. When Iceland was first settled, a quarter of the island was forested. The settlers destroyed 96 percent of the woodland within a few decades which caused severe erosion. The island's highlands were colder, drier and more fragile due to the lack of ground and woodland cover. The large grazing sheep population further exhausted the soil. Erosion was exacerbated by wind and snow runoff.

The Icelanders initially were unaware of the devastation they were causing to the land. Other than the volcanoes and hot springs, the land appeared very similar to Norway and Britain. The settlers finally took corrective action but it did not turn things around; some. The economic system in early Iceland left most people poor; some people starved to death. Despite the hardships and uncertainty that Iceland faced, it ultimately did survive. It won complete liberation from Denmark in 1944. By the 1950s, Iceland did a huge export business and its urban population had surpassed its rural population. Today it relies on its fish, geothermal power, hydroelectric power and what was once Europe's poorest country is now one of the world's richest.

The remote colony of Vinland lasted only a brief time. Vinland was described as rich in resources and as having a mild climate, low altitude and a longer growing season. Forests and pastures for the cattle were abundant. Lake and river salmon were also discovered. In spite of a treasure trove of resources it is thought that the Vikings gave up on Vinland because of the resistance they met from Native Americans.

Vinland failed as a colony because the closest trading partner available to them was Greenland. But the Greenland colony was small and lacking in sufficient resources especially timber and iron. Greenland was located at a far distance from Vinland and Europe. Greenland had few ships and presented no resistance when threatened by other societies. In A.D. 1000 the Greenland colony numbered only about 500. The failure of Vinland was mimicked years later by the failure of Greenland. Like Vinland, Greenland was remote and was unable to establish relations with Native Americans.

Analysis

This chapter focuses on a frigid area of the world. Although the temperatures and climates vary greatly from tropical islands or the southern Americas, surprisingly many of the same environmental concerns plagued the early settlers of Iceland, Vinland and Greenland.

Jared describes the Vikings who began as raiders and thieves but eventually began to settle the frigid countries located in the icy North Atlantic. There was a natural tendency for these settlers to follow the agricultural practices of the only ones they knew – that of Europe and Scandinavia. This chapter demonstrates how settlers in new areas must be willing to adapt to new methodology and processes depending on the environment and climate.



The new arrivals in Iceland did not face threats for inhabitants since there weren't any in the area they first inhabited. The story of Iceland and Vinland, an island that was west of Iceland, is a tale of one success and one failure. Vinland was actually richer in resources than Iceland but it was too far away from Norway and England to be considered a viable place to colonize and to have trade agreements with. Vinland failed because of the tyranny of distance. Iceland went through some rough times, but were able to adapt, protect their resources and survive.

Vocabulary

fugue, monastery, bishopric, correlation, manifestation, rudimentary, reconnoiter



Chapter 7: Norse Greenland's Flowering

Summary

Some historians believe that Greenland was purposely misnamed by Erik the Red to lure others to it. There is very little green on Greenland and a lot of white. The shores of Iceland feature a steep ice-covered plateau that covers most of the island. Enormous glaciers flow into the sea. Black mountains are surrounded by the icy white. There are patches of green, even pastures, inland on the southwest side of the island. Greenland was Europe's most remote civilization but its settlers eventually vanished.

One theory for the failure of Norse Greenland was that cold temperatures killed the people. Other explanations include: defeat by the Inuit, abandonment by Scandinavia, and damage to the environment. Greenland's climate is foggy, cold, variable and windy. Glaciers, icebergs and fjords all impact the temperature and climate. The weather varies from location to location, from season to season and from year to year.

Written records were left about Iceland's weather. However, there were no records left behind describing Greenland's weather and climate. Greenland experiences temperature fluctuations. A warming of sea temperatures caused the seal population to disappear from southern Greenland in the last century. When the Norse arrived in Greenland it was during a mild period, referred to as the Medieval Warm Period, allowing them to farm and raise livestock. The Little Ice Age that occurred between 1300 and the 1800s increased drift ice between Greenland, Iceland and Norway which ended trade. The Little Ice Age contributed to the failure of Norse Greenland.

Dairy products and crop yields were not sufficient for feeding the 5,000 Norsemen of Greenland. Cabbage, beets, rhubarb and lettuce were among the only vegetables that could have withstood the cold climate. Barley grew in mild years. The Norse supplemented their diets with the meat of wild animals, particularly caribou and seals. A severe winter could interrupt the migration of some seal species and delay the birthing of farm animals putting the Norse at risk of starvation.

Forensics indicates that seals increasingly became the main diet source for settlers over the years due to their failure in raising livestock and growing crops. Nearly absent from their diets were fish despite their abundance in and around Greenland. Not only is there an absence of fish bones in middens, no fishhooks, sinkers or nets are found in archeological digs. Norsemen came from lands where fish was the main dietary staple. Perhaps a religious food taboo had arisen that caused the Norse on Greenland to refuse to consume them.

The Norse had to have developed a very tight and complex economy in order to have made it on Greenland the 450 years they inhabited the island. They had to be disciplined in scheduling what tasks had to be accomplished and in what season. The settlers were interdependent and had to produce goods that could be shared and tasks



and land that could be portioned out among the community. Big or small, rich or poor, there were no farms in Norse Greenland that were fully self-sufficient. Walrus and polar bears, Greenland's main exports to Europe, were hunted in the western settlement but were processed and shipped from the eastern settlement. There is evidence that wealthier families had diets rich in caribou while seal was the main protein in poorer families.

Their interdependence was crucial for their survival. Any component of this economy that failed spelled eventual failure. Severe weather was an element that could doom their fragile house of cards. A prolonged winter could kill off livestock and delay crops both of which could lead to tough times. A decade of bad weather could finish them.

The Greenland Vikings held onto their European roots because it gave them their identity and their religion and perhaps most importantly trade agreements that kept them alive. The Norse depended on huge amount of imports for their everyday needs. They traded animal pelts, ivory from walrus tusks and live animals such as polar bears or falcons for resources and supplies they needed.

Psychologically, it was important for the Norse to consider themselves to be Christian Europeans. This need may explain some behavior that appeared to be self-destructive. Many large European-style churches were constructed along with a nunnery and monastery. This construction surely put a dent in the sparse supply of timber that the island possessed. The cost of importing other church equipment was passed on to the people who were also required to pay an annual tithe to Rome along with other mandatory tithes.

Expending so much time, effort and resources on requirements of the church may have contributed to Norse Greenland's ultimate collapse. There was an imitation of European standards in everything from churches to clothes and combs. Their need to be considered European was a huge emotional driver in the existence of the Norse Greenlanders.

Analysis

This chapter focuses on Norse Greenland that survived for 450 years despite the hardships it faced in climate, food shortages and conflict with the Inuit, who had settled there before the Norse arrived. The fact that the Norse lasted 450 years makes its decline and collapse remarkable.

The same problems with the environment and survival challenges faced the Norse Greenlanders as many other failed societies. Iceland and Greenland were very similar in climate and available resources. The settlers were able to survive in Iceland despite facing the same hardships as their brothers in Greenland. There was one major exception, however; the Icelanders did not have to contend with the Inuit initially. However, when the Inuit finally did inhabit the same region of Iceland as the settlers,



they decided to learn from them. The Inuit were a resourceful lot and had learned how to survive in the harsh conditions of the frigid islands of the North Atlantic.

The Greenland Norse were nearly obsessed with maintaining their Scandinavian roots. They refused to let go of their identity as a European Christian. It appeared to be psychologically imperative to them. Not only did the identity crisis that they must have experienced come from emotion and ideology, there was a practical reason for maintaining that identity. Norway was a very devout Christian society. King Olaf had decreed that no trade agreements with pagans would be established. The Norse in Greenland were completely dependent on Norway and England for vital supplies. So their need to identify with Christian Europe was more complex than just one of legacy.

Their obsession, however, kept the Norse from learning important practices for their survival in Greenland.

Vocabulary

disconcerting, schematic, benign, culled, arbitrary, poignant, cantankerous, litigant, maladaptive, ecclesiastical



Chapter 8: Norse Greenland's End

Summary

When Norse settlers first arrived in Greenland things were favorable. The land was pristine having never been touched and the weather was mild. No Native Americans were there to challenge them. Sea lanes were open and without icebergs allowing trade to flow freely between Greenland and Europe. Those early advantages turned against the Norse. Climate change, European's changing trade demands and the appearance of the Inuit and the Norse settlers' reaction to them would all prove to bring them down.

The Norse damaged their environment by destroying natural vegetation, causing erosion and cutting turf. Trees were cut down to create pasture land. Livestock grazing on the decimated woodland prevented it from recovering. They exhausted the timber supply that was needed for buildings, boats and implements. Wood was also needed to heat homes, cook food and pasteurize containers used for milk. The Norse operated on a very short supply of iron. This lack of iron made the society less efficient and its military less daunting and gave them no advantage over the Inuit.

The decimation of natural vegetation to make way for crop growing caused slow soil recovery that was easily dried out. Cutting down the trees and bushes had a deleterious impact on the soil and accelerated erosion. Exposed ground loses its top soil in strong winds. The land was also rendered useless by the wholesale use of turf for roofing and walls. The turf taken for construction was very slow to recover. Herd sizes of domestic animals were necessarily reduced because of the missing turf.

The collapse of Norse Greenland is attributable to the destruction of the environment, climate change, loss of contact with Norway, hostilities with the Inuit and the conservative thinking of the Norse. During the Little Ice Age lowered hay production which put the domestic animals at risk and clogged the ship lanes between Greenland and Norway with dangerous chunks of ice which eventually ended trade relations. It was a blow to Norse Greenlanders who relied on their connection with Norway for timber, iron and their own identity. The demand in Europe for ivory declined because it was out of fashion. The arrival of the Inuit and the settler's unwillingness to change were the final nails in the coffin. There is evidence that the abandonment of Norse Greenland was a gradual process. The western settlement disappeared first because conditions were worse there than in the eastern settlement.

It is uncertain exactly when the eastern settlement vanished. Between 1400 and 1420 the climate became cold and stormy. It was not until 1576 and 1587 when European visitors found only Inuit on Greenland. In 1723, Inuit showed the Norwegian Lutheran missionary Hans Egede to some Norse ruins in the eastern settlement. It was then completely recognized that the Norse colony had vanished and the questions about their fate began to grow.



The cause of their demise is not a mystery; the mystery is what their fate was. The collapse was probably rapid. The eastern settlement had a larger population than the western settlement. When things began to decline, the people probably put their resources together. They undoubtedly began eating their dogs and newborn animals just like the western settlers did. This proves the point that larger communities are just as much at risk as smaller ones – it just takes longer to the end.

Were the Greenland Norse doomed from the start? Perhaps they didn't have the natural survival instincts and abilities that the Inuit possessed. The Norse actually had an advantage over the Inuit and other peoples who had inhabited Greenland. They brought with them domestic animals and crops and did not have to rely solely on the land and sea for sustenance. When food supplies diminished, why did they refuse to hunt seal, fish and whales as the Inuit did? The Norse arrived in Greenland during a mild period. There were no weather forecasters so they had no idea that the weather was unusual. They were caught unawares when the cold climate which was more common returned.

The Norse settlers were averse to adapting new ways and letting go of lifestyles that they were accustomed to. They could not let go of their old European ways and life because that's when they felt happy and successful. They did not exploit the knowledge and experience of the Inuit for their own benefit. The power in Norse Greenland resided at the top with the chiefs and clergy. They used resources and trade voyages for items that they desired or that gave them prestige and made choices that benefited them rather than the entire community. Loads of timber and iron would have helped the Norse settlers en masse. But those in charge demanded luxuries and symbols of their power and authority that were a waste of time and resources.

Analysis

One of the contributing factors to the ultimate collapse of the Greenland Norse was that they chose to look down on the Inuit, refused to learn from them or emulate their hunting, fishing and agricultural practices. The Greenland Norse chose instead to cling to their European roots. They had an innate desire to identify as European Christian and a practical one that involved trade agreements.

The actions of the Norse in Greenland leading up to the society's collapse has many unanswered questions. Once their food supply from the livestock they brought with them was depleted and when trade with Europe petered out why didn't they hunt seal, walrus and whales like the Inuit? It is one thing to have a pristine identity but it's another to starve. There was speculation that perhaps some religious taboo kept them from eating the seafood although Norway's main diet was fish. It seemed that the Norse were on an inexplicable path of self-destruction.

This is an important lesson for those who travel to other lands to live. One can maintain his personal identity but cannot ignore practices that will make him succeed and survive.

Vocabulary

ephemeral, velocity, forage, laconic, radiocarbon, sediment, pasteurization, tantamount



Chapter 9: Opposite Paths to Success

Summary

There are lessons to learn from both successful and failed societies; this suggests that there is more than one approach to environmental problems. Small societies can try a bottoms-up approach in which people recognize their problems and work together to solve them. The top-down approach is more appropriate for large communities where the government or other authority figures work at solving a community's problems. This is thought to be effective because in a large culture the government has a bird's eye view of the entire community, can spot where the problem is and has the resources to resolve it. Neither approach may be appropriate for a medium-sized community. The bottoms-up approach worked in the highlands of New Guinea and in Tikopia an isolated tropical island in Southwest Pacific Ocean.

The people of New Guinea faced problems of wood supply and soil fertility and overpopulation. The population increases were checked by war, infanticide, contraception, abortion and abstinence. Tikopia has been occupied for nearly 3,000 years. It is difficult for the islanders to imagine a large land mass on which the sound of the sea could not be heard from everywhere. The directional terms they used are "seaward" and "inland." They imported stone and unmarried young people as marriage partners. Starvation was always looming so they had to grow or import and store sufficient food for their population.

Tikopia is blessed with high rainfall and a temperate climate. Beyond that, the islanders have developed methods that has kept them alive for centuries. The island is managed to insure that there is continuous and adequate food production. Every plant, even grass, is used by the islanders. Their trees all produce edible nuts or fruits or material that can be used to make essentials. Starchy plant foods, fish and fowl are the staples of their diets. They have devised ways to have emergency food supplies. The islanders control their population so that it is stable and sustainable. They did not rely on crops alone; they nurtured nut and fruit trees. They learned the process of fermenting and storing breadfruit from Polynesians.

In A.D. 1600 they decided to eliminate all pigs because they rooted and trampled their crops. They relied on fish, shellfish and turtles for protein. Today Tikopians thrive under the economic plan that they devised themselves. Every person on the island knows what's occurring on every part of the island. There are leaders but one of their main roles is to redistribute resources. For bottom up approaches to be successful the society must have all rights to its economic activities.

Japan has had a long history of forest management. Germany was able to develop a forest management system that recovered their declining woodlands. Like Germany, Japan developed a top-down forestation system. The forests in Japan are located on mountains and are well-protected and managed by the government. Japan's forest



problems began with a population explosion after a series of wars. Although cities sprung up and there were many advancements in the nation, trade with other countries had almost died out. But Japan was self-sufficient and produced its own food, timber and metals. Japan opened its ports to trade after a visit from Commodore Perry in 1853.

Tokugawa shoguns and the daimyo to impress each other all built huge palaces and temples which required cutting ten square miles of forests. Cities that had been destroyed by fire had to be rebuilt taking more wood. Along with construction, there was demand for wood for heating and cooking and for domestic and industrial uses. The depleting forests caused an end to monumental construction. Wild fires increased because sapling were more flammable than large trees. Soil erosion increased because of slow regrowth. The scarcity of wood when the population was increasing was a turning point.

It took two centuries for the population to stabilize from a top-down approach. Imported food relieved pressure on farming. New fishing techniques were devised and methodology was developed to reduce wood consumption. Measures were taken to balance cutting trees and replacing them. The Japanese top-down solution was comprised of three stages: woodland management, wood transport and wood consumption. Logged lands were closed off to allow regeneration. Detailed inventories were kept of the forests. Wood shipments were monitored and inspected. Wood could only be used for approved purposes. Measures were taken to prevent and limit erosion. Plantation trees were developed and protected as slow-growing crops. Reliance on fish and seafood relieved the pressure on the land.

The Tokugawa shoguns who stayed in power for centuries made the decision to invest in the future by ensuring that resources would be available for future generations. Political and social pressures compelled those who oversaw small woodland areas to comply with the conservation practices established by the shoguns.

Analysis

The stories of the bottom-up approach taken in preserving and protecting the environment in both New Guinea and in Tikopia an isolated tropical island in Southwest Pacific Ocean are both success stories. These island people, unlike many others in the past, recognized the damage that was being done to their natural resources and took action. The bottom-up approach is one that is taken by the people as opposed to the top-down approach that is taken by an authority or government. The people saw the problems, came up with solutions and fixed the problems before they became too far gone.

An example of a successful top-down approach is when the Tokugawa shoguns in Japan also recognized the harm that was being done to their woodlands and other elements of their land. They had the foresight to take action and even though some of their remedies were not popular they had the requisite leadership skills to forge ahead with what they knew would fix problems and protect the land for future generations.

Jared Diamond makes the point that solutions can come from on high or right on ground zero. If a government or people are insightful and aware enough much can be done to turn damage around and save the environment.

Vocabulary

spatial, extirpated, paradoxically, autonomous, esthetic, promulgate, renunciation

Chapter 10: Malthus in Africa: Rwanda's Genocide

Summary

The rate of population growth in Africa is among the highest in the world. The impact of that growth on the environment is readily apparent. Grass in the pastures is sparse, advanced erosion is apparent and streams are brown with run-off mud. The continent is healthier than in the past with improved hygiene and health practices, antibiotics and control of endemic diseases. Many of the nations in Africa are experiencing population explosions without the increase in food supplies to match.

Rwanda and its neighbor Burundi were experiencing population growth, ethnic violence and genocide. They are among the most densely populated states in the world. The populations of both countries consist of two tribes – the Hutu and the Tutsi. The Hutu are farmers while the Tutsi are pastoralists. Colonial governments in Germany and Belgium considered the Tutsi to be racially superior to the Hutu because the Tutsi had a more European appearance.

Both countries were liberated from their colonial masters in 1962. Hutus tried to overthrow the Tutsi so that they could be the dominant tribe. But the Tutsi retained their domination. Between 1967 and 1972 the Tutsi killed several hundred thousand Hutu. In Rwanda the Hutu eventually gained the upper hand. Rwandan economy was damaged by drought and deforestation, erosion and soil fertility losses. Another blow to the economy was a steep decline in prices for Rwanda's exports of coffee and tea, World Bank restrictions and drought. There were still conflicts and bitterness. Young men were recruited to join militias. Things came to a head in 1994 when the Rwandan's plane was shot down.

Within six weeks an estimated 800,000 Tutsi were slaughtered. There was a third ethnic group in Rwanda known as the Twa or pygmies. Most of them were killed in the 1994 killings. There are not marked differences between the Hutu and Tutsi other than appearance. They live in the same communities, intermarry and have the same language among other similarities. Many have grandparents on both sides. The war caused a lot of personal conflicts and tragedies. When the number of Tutsi declined, Hutu wound up killing Hutu.

After Rwanda was liberated from its colonial master, it retained antiquated farming practices. The demands of the increasing population were met by cleaning forests and draining marshes to gain new farmland, shortening fallow periods and pushing the soil to produce more crops each year. With the killing of the Tutsi, Hutu farmers felt they had the land they needed to feed their families and communities. By 1985, all arable land was being used. But the land was not keeping up with the population growth. Soil erosion became a huge problem and the rivers were filled with mud. Crops and topsoil



were swept away overnight. Deforestation and drought intensified the decline leading to food shortages with climate change playing a role. Young people stayed with their parents and delayed marriage. There was a great disparity among the incomes and earning power within the society. Large farm owners had many more opportunities to earn off-farm income which allowed them to buy more farm land and squeeze small owners out.

Kanama in the northwestern region was a microcosm of the nation. The majority of the population of Kanama was impoverished, starving and without hope. Conflicts arose out of fear and desperation. There were arguments over land and food. "Hunger thieves" who owned no land and had no off-farm income stole food for their very survival. Before the crisis, large farm owners used to help out the smaller struggling farmers. Sometimes fathers were even pitted against their own sons. There were conflicts involving son against son. These conflicts and anger led to the killings of 1994. Those targeted for killing were landowners, members of the militia, troublemakers and young people who had been able to earn off-farm livings.

Some Rwandans ignore the environmental challenges that led to the nation's collapse preferring to believe that it was a natural thinning out of a population that was too large for the land. It's important to understand what happened in Rwanda so that steps can be taken to recognize the risk and prevent a recurrence. The one-explanation reason offered by some has been debunked due to the evidence of the many contributing factors that led to the genocide. The prolonged pressure of the growing population was a constant stress on the nation. Rwanda's collapse was certainly an example of a Malthusian crisis in its most simplistic definition. The population had outgrown what the land could provide.

Analysis

The environmental disaster that drove the genocide in Rwanda in current times was deforestation and the resultant damaged soil that could not provide enough food for the population that was constantly growing. Jared Diamond refers to the Malthusian crisis which declares that basically population growths overwhelm food production and lead to food shortages and starvation.

One of the drivers of the genocide was the ethnic hatred between the Hutu and Tutsi. The Hutu outnumbered the Tutsi and starvation was the trigger that sparked the killing of every Tutsi that the Hutu could hunt down. Despite this barbaric, draconian effort to purge the Tutsi to basically leave more food for the Hutu, starvation and disease still existed among the Hutu.

Ironically, the Hutu and Tutsi lived in the same villages and intermarried. Their cultures were very much alike. During the wars of 1994 when the genocide occurred, father was often pitted against father and son and brother against brother.



Population explosions devastate a people and their environment. Farmlands are overused and exhausted by people trying to keep up with the demand. The solution is to limit population growth and to find solutions to feed the people before one people turn against another.

Vocabulary

intermediaries, intergradations, ecological, lampooned, genocide, fatalistic, exonerate



Chapter 11: One Island, Two Peoples, Two Histories: The Dominican Republic and Haiti

Summary

The Dominican Republic and Haiti share the Caribbean Island of Hispaniola. From the air the differences are stark. The Dominican side is dark and green while the Haitian side is pale and brown. The first European visitors noted that the island was largely green and forested. Both countries have lost forest but Haiti has lost far more.

Deforestation has caused the loss of timber, erosion, loss of soil fertility, pollution of fresh water sources and decreased rainfall in both countries but much more so in Haiti. Both are poor countries, have weak governments, insufficient food supply and serious social problems. Haiti is the poorest country in the world outside of Africa and among the most over-populated. There is a high rate of infection with AIDS, tuberculosis and malaria among the poor. There is no hope in Haiti.

The Dominican Republic suffers from the same problems however they are less acute. Incomes are higher, the government less corrupt and more stable. The economy is booming thanks to exports of iron and nickel and other minerals. The mining industry employs 200,000 people. The nation is also has a robust agricultural export industry. The government takes important steps to protect its forests and preserve its woodlands. Both countries were European colonies and Haiti was much richer than the Dominican Republic at one time.

Oddly, it was in 1930 that a dictator brought a semblance of stability to the Dominican Republic. Rafael Trujillo worked to modernize the country and develop its economy. He also killed and tortured people and established a police state. He took ownership of most of the country and took the majority of revenues from the country's various industries. He even took a ten percent cut from prostitutes. He finally began to lose support and power in the 1950s when the economy began to crumble. The CIA was involved in his assassination in 1961.

Haiti had its own evil dictator, Francois "Papa Doc" Duvalier. He was ruthless and cruel, terrorizing the people with his secret police. He had no interest in developing the country. His son succeeded him after Duvalier died of natural causes. Jean-Claude "Baby Doc" Duvalier was forced out in 1986. Politically, Haiti remains unstable. After a civil war in 1965, the Dominican Republic Joaquín Balaguer was elected president and remained an important political figure for years. He was a positive force and rescued the country's natural reserve system in the year 2000 when he was 94. In the years after Trujillo, the Dominican Republic continued to develop and industrialize. Although still

considered a poor economy, it is growing and is experiencing a huge construction boom.

The Dominican side of the island receives more rain than does Haiti which benefits forestation and agriculture. Haiti is mountainous while the Dominican side is flat and more conducive to crop planting. Haiti was a colony of rich France and became its most valuable colony. France developed plantations and imported thousands of African slaves to work them increasing the population in rapid fashion. The French stripped the Haitian forests of timber and brought it back to France. European immigrants who were educated and skilled professionals were welcomed as immigrants by Dominicans. Europeans did not feel welcomed by the Haitians and actually weren't interested in developing relationships with them.

After Balaguer took office he re-established measures to save the forests and the soil and advocated hydroelectric power to maintain a healthy water supply for the people, the forests and the crops. During the years he was out of office, he was still a huge political force and defender of the land. During the Balaguer era, both bottom down and top up approaches were made to preserve the environment.

The Dominican Republic's current environmental problems involve the forests, marine resources, erosion, population growth, the industrial pollution of rivers and streams and damage from toxins. With the exception of population growth, these issues are all being addressed by the country's comprehensive reserve system of protected areas. There is pessimism about the Dominican Republic's ability to continue to succeed. Many are discouraged by the weakness and corruption of recent governments and the declining economy. Some fear it is slipping into the abyss with Haiti. It is a resilient country that has withstood greater crises.

As poor and as overcrowded as it is, Haiti is becoming poorer and more crowded. Haiti's decline is felt around the world especially to the many Haitians who have immigrated to other lands and to the Dominicans who are directly impacted. Haitians travel to the Dominican side for jobs and for wood. The Dominican Republic is rapidly becoming a country with an increasing Haitian minority. There are recent signs of some cooperation between the two countries which could lead to positive results.

Analysis

The example of Haiti and the Dominican Republic is one in which two societies that share the same island with fundamentally the same resources have vastly different results. Haiti is one of the poorest nations on earth and most economic experts and environmentalists have little hope for its survival.

Haitians have suffered from the destruction of their woodlands and farmland and from weak and corrupt leadership. Haiti was settled by the French who imported huge numbers of slaves from Africa to work the plantations. The French deserted the island



eventually and abandoned its people. Other European countries looked down on Haiti because they considered it part of Africa.

On the other side of the island is the Dominican Republic. Although they have been challenged as well with poverty and environmental decline, they have fought back and have an improving economy. They had the benefit of a dedicated leader, Joaquin Balaguer who was honest and devoted to improve his country and giving his people a better life. The Dominicans were open to immigrants who were more educated and who could elevate their society. They were willing to adapt new ideas to make improvements.

This example proves that even when there are environmental difficulties, the choices that are made can make the biggest difference.

Vocabulary

exuberance, encroachment, trajectory, mulatto, ubiquitously, aspirations, idiosyncratic, impetus, clandestine



Chapter 12: China, Lurching Giant

Summary

China is the most populous country in the world with an estimated population of 1.3 billion people. It is rich in plant diversity and its size is the third largest in the world. The economy is growing at nearly ten percent per year. It is also one of the most productive nations. However, it has some of the worst environmental problems facing it for a major country. Air pollution, grassland degradation, salinization, soil erosion, water pollution and trash accumulation are but a few of the environmental issues before them. Despite their roaring economy, these environmental concerns are impacting the economy and societal at large. These issues are also causing serious health problems. Due to globalization, China's economy reaches into every corner of the world. Their problems will become everyone's problems. They are responsible for the majority of sulfur oxides and other harmful substances into the air and travel all around the globe.

China has a diverse geography that includes the world's highest mountains and many lakes and rivers. There are glaciers, deserts and tropical rainforests. High altitude areas are impacted by high winds and dust storms. The government has mandated a limit to the number of children a family can have to control population. Urban areas are increasing in population at a faster rate than are rural areas.

China is the largest producer and consumer of coal and fertilizer. Railroad, motor and airline routes have lengthened. Motor vehicles increased 15 times between 1980 and 2001 and in 1994 increased 9-fold which compelled the nation to make the car industry one of their pillars of industry. They would be the third largest car manufacturer in the world after the U.S. and Japan. The Chinese depend on antiquated and efficient polluting technology that fails to live up to modern standards. Most of its energy consumption relies on coal which is the main cause of air pollution and acid rain. China has gone through several phases of severe deforestation during its history.

Water is in short supply and is polluted due to industrial waste. There are no regulations on the use of water by industry which is one of the causes of flow cessation during the dry seasons which impedes ship navigation. China's soil erosion is among the worst in the world. The soil is also impacted by deforestation, salinization, desertification and fertility loss. The problems with water and soil impact the nation's food supply. China has no first world solutions to its domestic and industrial waste. The grasslands and wetlands have been degraded. Although fish is becoming an increasing staple in the diets of the Chinese, the coastal marine fisheries are being impacted by pollution and overfishing.

The Chinese people are already suffering from economic and health costs and exposure to natural disasters including dust storms, landslides, droughts and floods are closely related to environmental damage. The suffering is both economic and physical and impacts the food supply. China has been aware of the environmental impact that



their country is having on the world. They have publicly recognized it since 1972. They declared environmental protection one of their principles to live by in 1983. However, the laws and regulations to protect the environment have not been enforced or in some cases even implemented. China's geography is without islands or peninsulas allowing its rulers to have better control over the nation. China's international trade has increased which is good for their economy but bad for those who receive the pollutants that are not removed. Trading partners can improve China's behavior by demanding it adopt certain standards.

There are signs of some improvement. World pressure has compelled China to make improvements. A green wall is under development that will protect Beijing against dust storms. They have phased out lead in gasoline and established fuel efficiency standards. It has also developed nature reserves, wildlife breeding centers and expanded zoos and botanical gardens. It is essential that China continue and expand these practices not just for their country but for the global population.

Analysis

China boasts about its huge and growing economy, although many believe that they overstate it. But they don't boast about the damage they do to the Earth. China is the most populous nation on earth and has one of the largest geographic expanses. As such, whatever actions China takes, just by sheer volume alone, it impacts the rest of the earth. They dump debris and toxins into the water that eventually travel around the world to bring "good cheer" everywhere. They also pollute the air with little forethought that the air travels on air currents that circle the globe.

Everyone has seen the allergy masks that many Chinese wear. It's not allergies that they are avoiding; they don't want to breathe their own air because they know it's toxic. They are lax in their shipping standards and have shipped alien species to many countries around the world including North America where the chestnut blight, "Dutch" elm disease and Asian long-horned beetle has wiped out a number of tree populations.

There is some hope that things will change in China. Worldwide pressure from other leaders who threaten to stop trade agreements have made them pay attention. It is up to the leaders of the world to force China to adhere to standards that will protect the environment and it is up to the public to boycott their products.

Vocabulary

superlative, ecosystems, mandatory, incipient, harbingers, delineated, fodder



Chapter 13: “Mining” Australia

Summary

Mining is an important part of Australia's economy. It is their major export revenue. Their dilemma is that they are depleting resource that their economy depends upon and that are not renewable. Renewable resources can be exploited as long as there is a renewal process that is closely adhered to. Unfortunately, Australia is using up its renewable resources at a rate faster than they can be recovered. Australia is a first world country but is much smaller and has a population that is less dense than most other advanced nations.

Australia's environment is very fragile. Only Iceland's is more so. Australia is suffering from overgrazing, salinization, severe erosion, water shortages and droughts that more typically impact third world countries. There is more hope for Australia than other countries with their problems. Their people are educated and live high lifestyles. Australia has a strong economy and a stable government. Humans have had a negative impact on Australia's environment. Climate change has escalated the impact. They have no adversaries and no prospect of conflict. They are not isolated and have good relations with England and other first world nations. They have demonstrated that, as a culture, they have good values. They are willing to learn and change.

Three elements are the focus of the Australian environment: soil condition, availability of fresh water and distance within the continent and to its trading partners. The majority of Australia has a low rainfall. Some areas are desert making agriculture impossible without irrigation. There is less rainfall inland than there is on the coast therefore growing crops inland is more of a challenge. Australia's rainfall is not seasonal and therefore unpredictable making planning for dry stretches impossible. The only area of the continent where rain is predictable is in the wheat belt where winter rains are reliable from year to year. As a result, wheat has become Australia's most valuable agricultural export.

Australia is a victim of the tyranny of distance. It lies a great distance from other countries with similar climates that would be natural customers for its exports. Shipping and proper preservation of the goods are costly. The distance is so far that some of Australia's products are not practical to export to some countries. Only low-bulk, high-value items are worth the expense and preparations.

Much of the farmland in Australia is owned by the government. When Brits first immigrated they didn't like the eucalyptus and acacia trees and mowed them down. Until twenty years ago, the government subsidized new farm lease holders and required them to clear the land. The land was used a few times and abandoned because of the poor condition of the soil. Deforestation and over-grazing have severely degraded the environment for centuries to come. The Brits made the mistake of trying to imposing British farming practices in Australia. The rural vote is strong and has caused the



continent to support ineffective and passé measures including mining that continue to damage the environment.

Australia is the world's largest wool producer; however, wool production and demand are decreasing from competition by synthetic materials. Australia also exports what and is a net food exporter. Mineral is the number one industry with tourism coming in second. Land degradation is the number one environmental problem facing Australia and is due to deforestation, over-grazing, over-population of rabbits that destroy vegetation, nutrient exhaustion, man-made drought, alien weed species, government policies and salinization.

Other than Antarctica, Australia has the smallest forest area of all the continents. Deforestation has devastated the woodlands. The soil is lacking in nutrients which has harmed fish who depend on the nutrients in soil run-off that flows into the rivers, streams and the surrounding ocean waters. Over-fishing has damaged the fisheries. Australia is the continent with the least fresh water. If the population grows as politicians hope, the supply of fresh water will be a problem. Australia has fewer indigenous animals than the other continents. Alien animal and weed species that threaten native species have been introduced into its environment. Domestic buffalo, camels, goats and other animals that were introduced into Australia have gone feral and threaten the habitat of native animals.

Voices are being raised in Australia about climate change and impact that certain practices and industries have had on the environment. There is opposition to excessive land clearance and logging. Taxes are being raised to clean up the water supply, phase out old-growth logging and end massive land clearing. There are some who feel that Australia should give up farming all together. The government expends a fortune in subsidies to keep the farmers afloat. That money could be used in many other ways to make real improvements.

Analysis

Australia is a first world country that wants to be a world power. Australia is a continent and a country and is roughly the size of the United States. However, its population is only 20 million compared to America's 330 million. Its plan is to add 30 million to "fill up" the country and be on a level with the U.S. and other super powers. The leaders must recognize that a rapid population increase will threaten its food supply which is already threatened from the land degradation that it suffers. It also has difficulty in keeping a fresh water supply. Thirty million more mouths to feed is something that cannot be discounted.

Australia's main export is wool and with advancements in synthetic materials, the demand for wool is decreasing. They are big what producers but trade very little food beyond that. They suffer from the tyranny of distance which means that they are too far away to trade with countries who are like them other than a few items. It is too



expensive and takes too long to ship perishables. Their location may keep them from becoming the big power they want to be.

Like the Norse who colonized Greenland, Brits who were transplanted into Australia did not feel at home and missed England. Self-identification with the Brits was very important to them and may have immobilized them in a way that they were late to adapt to new practices and behaviors that may have pushed them along further than they are.

Vocabulary

metaphorical, substrate, climatologists, fallacy, prophesized, blithely, warren, panoply, pastoralist



Chapter 14: Why Do Some Societies Make Disastrous Decisions?

Summary

Many question why societies often make so many disastrous decisions that ultimately cause their collapse. Were their intentions malicious or done out of ignorance? Complex societies are not likely to fail due to the mismanagement of environmental resources. However, it is exactly this behavior that has brought down many societies in the past.

Group-decision making is at the core of a society's collapse. The failure to anticipate a problem, recognize a problem once it has emerged, not try solve it and then fail to solve it all contribute to the collapse.

The failure to anticipate a problem may be due to a group's inexperience. Global warming has sneaked up on a lot of people through ignorance or denial even though there have been signs of its impact for decades. "Creeping normalcy" refers to developing trends that are difficult to detect because they occur so slowly. "Landscape amnesia" refers to misremembering how the landscape used to look because of gradual change.

The most surprising behavior is when a society finally recognizes a problem but doesn't try to fix it. "Rational behavior" is a term used to describe the actions of someone in authority who see a way to advance his own interests while leaving a problem fester that will hurt the community. The author points out that such behavior can be seen in the U.S. Congress. The opposition party finds fault with everything the president does. They would rather shut down the government than concede a victory to the president. As Tacitus put it the lust for power is "the most flagrant of all passions." This behavior is also seen in corporations and industries as well when the prize is not power but profit. It is a selfish and narcissistic behavior that, in the hands of those in authority, can be very destructive.

"Tragedy of the commons" refers to overusing or exhausting a resource in a common effort. Overgrazing in a communal pasture is an example. Marine fisheries have suffered greatly from common overfishing. Government regulation, individual ownership, and bottom-up commitment can combat tragedies of the commons. Other attempts to solve problems are termed "irrational behavior" by social scientists. Also referred to as "wooden-headedness" or "persistence in error" or "tone deaf," behavior that stems from religious belief or ideology that is at odds with the good of the community is not rational. The Australians held onto their obsession to think of themselves as Brits. The Christian Norse clung to their European values while refusing to learn from the Inuit who knew how to survive in Greenland. The Hutu wound up killing their own kind after they had killed off their enemy, the Tutsi. Countries can make huge changes that benefit its



people: the U.S. abolished slavery; the USSR became Russia again; Japan gave up its military.

“Crowd psychology” also known as “herd mentality” and “group think” produces irrational solutions because they are the most popular among the people. A leader will make the best decision for the community even if it’s unpopular. “Psychological denial” occurs when there is emotional pain associated with an outcome. Decisions are therefore made to avoid this pain. People living downstream from a dam refuse to worry about it bursting because their family would be in peril. It’s more pleasant to believe that the dam is not a threat to them because it is not near them.

Even if a society earnestly tries to solve a problem, it can still fail. Alien species introduced into an environment to improve conditions can backfire and become destructive. Societies do not normally fail in solving their problems. There are more success stories than failures. Why some societies follow the wrong path is complex.

Better understanding of the causes of a failure will help avoid them in the future. JFK and his advisors made a disastrous decision in the Bay of Pigs invasion. He learned from his error and made the right decision in the Cuban Missile Crisis. The Tokugawa shoguns and Joaquín Balaguer are examples of leaders who were courageous and insightful and who made decisions in the face of adversity.

Analysis

In this chapter, Jared Diamond analyzes why some societies survive and others collapse. It has to do with the choices they make. There are valid reasons why some societies and leaders make the wrong choices. He uses such terms as “creeping normalcy” which means that a bad trend occurs so slowly that it’s nearly invisible. He talks about irrational and rational choices and how both can, in a sense, turn out to be irrational.

The herd mentality and group think causes leaders and advisors to start listing to themselves in an echo chamber and start thinking that what they’re saying sounds pretty good. Everyone is familiar with someone who suffers from wooden headedness – stubborn people whose narrow view blocks out reality. Another way of thinking that produces bad results is psychological denial that is emotionally charged. No one wants to admit that the dam right up the road from them is in dire need of repair. It’s too frightening especially when it is obvious that there are not funds to fix it.

An open attitude and a willingness to face the truth no matter what it is, is the healthiest way to function. Admitting mistakes and learning from them makes moot the old adage that if you ignore history you’re doomed to repeat it.

Vocabulary

reprehensible, imperative, coherent, recalcitrant, idiosyncrasies, encroaching, glacial



Chapter 15: Big Businesses and the Environment: Different Conditions, Different Outcomes

Summary

Modern societies depend on both renewable resources like wood and fish and crops and non-renewable resources like oil and metals. Logging, mining and fishing are among the largest industries in the world. Big business is most often blamed by environmentalists for damaging the environment for the sake of profit. Corporations believe that environmentalists have narrow views of their processes.

The hardrock mining industry is the leading toxic polluter in the United States. Mines pollute water with toxic chemicals and ores. Mines also use giant shares of local fresh water supplies. The disposal of debris including waste rock is also a problem. Depending on local laws, the debris is dumped into a river or ocean, piled up on land or piled up behind a dam. Tailings dams are generally poorly constructed and often burst sending the debris into the environment in alarming amounts.

Solutions for the impact of hardrock mining is to require the mining companies to conduct thorough and complete clean-ups and restorations after shut-down. Many mining companies do slipshod clean-ups and walk away. Some declare bankruptcy conveniently after they are done extracting the ore and just before cleanup. In Montana, Pegasus Gold agreed to a cleanup but shifted its assets to another company under a new name and declared bankruptcy saving itself millions which was distributed to the executives as bonuses. Although Pegasus wound up paying for some of the clean-up, \$22 million was paid by U.S. taxpayers.

The environmental damage from coal mining closely parallels that of hardrock mining although they create less debris and waste to be disposed of. The coal industry operates under more regulations than does the hardrock mining industry. Although the industry predicted its demise, it has learned to cope with the regulations and operation under them. The coal industry is restoring mined areas within a year of shutdowns. There is less public opposition to coal mines because they are perceived to be a necessary evil. One can do without gold but not coal. Its relatively short supply chain makes its operation more transparent to the public.

The question about who should pay for mining that is being done now and in the future. Mining does not produce an abundance of profits for the company. Clean-up is expensive and the public is the victim of the environmental damage it leaves behind. Environmental costs should be factored into the cost of products that contain the minerals and metals that are extracted from mines.



The demand for fish and seafood is rising around the world especially in China. Forty percent of the protein consumed in the Third World comes from fish. Fisheries are hard to control especially those who are managed by more than one nation. The world's largest commercial marine fisheries have either collapsed or are on the verge of collapsing. The tragedy of commons, poor management and regulation and government subsidies are behind these failures.

Overfishing has caused damage to future supplies of fish and to the continuation of some popular fish and seafood. Most fish are caught by net which also catches unwanted or juvenile fish that are thrown back or are damaged or killed in the process. Overfishing also causes damage to marine habitats. Sea beds are damaged by trawlers, coral reefs by dynamite and cyanide. Overfishing also threatens the livelihood of fishermen who have no other career to turn to.

Leaders in the fish and seafood industries have teamed with the World Wildlife Fund and founded the Marine Stewardship Council to provide credible eco-labeling to consumers. The standards set by industry experts include maintaining a healthy fish stock, ecosystem integrity, sustainable harvests and compliance with current laws. The focus of the inspection is the fishery itself, the fish stock and the fishing method, practice and gear used. Collectives of fishermen, intermediate processors and distributors are the entities that seek certification. The largest fishery to be certified is the wild salmon fishery of Alaska. There are fisheries that are certified around the world.

Big business can make big profits in the short-term by damaging the environment. The public has a responsibility to see that companies adopt practices and processes that protect the environment. Governments can do their part by enforcing environmental laws and regulations and by awarding contracts to companies that comply.

Analysis

The author describes the role of big business in both causing environmental harm and in being part of the solution. It is the responsibility of big business to understand the fears, needs and desires of the public and it is up to the people to understand the business operation and the restraints and demands that are put upon them.

Mining is a necessary industry. Many think of it as dirty and a threat to the environment and human health. However, they also want the ores and metals that are mined and brought up. It is an area where people have to come to terms with the nature of mining. The mining industry does not garner near the profit that the oil industry enjoys. Additionally, mining is generally a messier process than oil drilling. As such, it leaves debris, ore remnants and dirt behind and clean-up is an expensive process.

The consumer should think about who should pay for the clean-up. The coal companies don't make a large profit. If the public demands coal and other minerals and ores, perhaps it would be fair to pass the cost of clean-up along to the consumer. If expected



to absorb some of the clean-up cost, the consumer must keep in mind that cleaning the mess up is of the utmost importance.

Vocabulary

rainforest, seismic, expulsion, occidental, adamant, minuscule, disenchantment, reiterate



Chapter 16: The World as a Polder: What Does It All Mean to Us Today?

Summary

Twelve serious environmental problems faced past societies and still face today's societies. The rapid destruction of natural habitats through deforestation puts the ecology at risk and represents loss for humans because of the wood and other raw materials as well as the protection to the eco-system that they provide. A large segment of the earth's wetlands have been destroyed. The wetlands are crucial for maintaining the quality of water supplies and freshwater and marine fisheries. The destruction of coral reefs is a major contributor to climate change.

The demand for fish and seafood is steadily rising. Over two billion people depend on fish for their main source of food and protein. If marine fisheries were managed properly this renewable source could be maintained at optimum numbers and there would be no shortage.

Many wild species have been lost or are at risk. The extermination of big edible animals and plants that bear fruit or nuts spelled the end for societies on Easter Island and Henderson. However, the loss of small species also upsets the ecological system and causes lasting damage to the environment.

Soils and farmlands have been severely damaged by overgrazing, over-cultivating and water and wind erosion. Other types of damage include salinization, loss of fertility and nutrients. The loss of nutrients impacts freshwater as well as marine fish that both depend on the nutrients in run-off soil.

The world's major sources of energy are oil, fossil fuels and coal. At current consumption they will be exhausted within a few decades. While there are deeper reserves of these energy sources they are not easily accessible and extracting them will be more costly and more disturbing to the environment.

Lakes and rivers near population centers are being used for irrigation, domestic and industrial uses and for fishing, transportation, fisheries and recreation. The only pristine rivers and lakes are not near population centers. Underground freshwater sources are being depleted at rates that do not allow them to recover. Seawater can be converted into freshwater but it is a costly process.

Due to the destruction of habitats, farmland and the woodlands, the amount of solar energy per acre by plant photosynthesis has been reduced. The process depends on temperature and rainfall. It is estimated that humans will use up most of the world's terrestrial photosynthetic capacity by mid-century. This means that humans will use up that energy with little to spare for plants and forests.



The chemical industry releases toxins into the air, soil, oceans and lakes and rivers. Harmful toxins can harm species and cause birth defects, mental retardation and lasting damage to immune and reproductive systems.

Alien species are brought into new environments in an effort to renew them. However, they are not indigenous and often are harmful. They have devastated native species and cost nations in the millions and even billions of dollars to eradicate them.

Human activity causes gases that impact the atmosphere and damage the protective ozone layer. They also form as greenhouse gases that steal our sunlight and lead to global warming. Most scientists agree that the globe is warming at an accelerated rate. The disappearing snow packs have caused a shortage of fresh water in western states.

Population increases are causing increases in the demand for food, space, water, energy and everything else that humans need to thrive or even survive. The highest rates of population growth are in third world countries, the lowest in first world countries. Zero Population Growth is a movement that advocates the slowing or halting of the earth's population.

Man's impact on the environment is more of a concern than population growth. Although developed countries and organizations like the United Nations encourage people in third world countries to aspire to the lifestyles of the first world, the globe could not bear the strain if the entire population of the earth – six billion people – made the same demands on the environment as the current first world population does. A balance must be struck between encouraging third world nations to uplift themselves and not overstressing the earth and its resources.

Although twelve problems facing the earth were enumerated, they are all connected; one impacts the other. The world at large is consuming resources and space at a rate that is not sustainable. All these issues will contribute to the collapses of societies. They won't all collapse at once but at the present rate, they will all eventually collapse. Once the current crisis is finally accepted as our reality, steps can be taken to resolve these problems.

Problems are not unsolvable when dealing with the realities and threats of today's world. There are parallels between the problems of yesterday and today and there are lessons to be learned from failed societies and from successful ones.

Analysis

The author discusses the most important environmental problems that exist today. He discusses renewable and non-renewable resources and that renewable resources must be protected and preserved adequately so that they do renew. There are twelve environmental issues that are the most pressing.

These twelve main issues are: deforestation, loss of wetlands, soil erosion, loss of agricultural land, reduction in marine life, pollution of rivers and streams, dumping of



toxins, destruction of habitats, introduction of alien species, human impact on environment, population growth, greenhouse gas effect and loss of ozone layer. These twelve issues are listed separately but they are literally all connected.

The good news is that there are people working on finding solutions and fixes for each of these issues. The bad news is that damage to the environment continues. The world at large, its leaders and all the people, must recognize and accept that the environment and therefore the Earth is in trouble and needs man's help in rescuing it. In the world that has been made smaller by technology and globalization, everyone must be a player or the solutions will not be successful.

Vocabulary

photosynthetic, habitat, savannah, catastrophic, aquaculture, pollinators, herbicide

Important People

Jared Diamond

Author Jared Diamond was born in Boston and never was west of the Mississippi until after he was fifteen. Jared's father had been a pediatrician who treated a local boy with a rare disease. The family decided to spend a summer in the Big Hole Basin south of the Bitterroot Valley. Jared was immediately overwhelmed by the beautiful land and rugged terrain. He understood why Montana was called Big Sky Country. Even after spending time in exotic places like New Guinea and the Andes, he could not forget Montana.

Jared Diamond became a scientist with focus on evolutionary biology, ecology and society's impact on the environment. In his work he has done vast research including much of it in the field. He is a professor of geology and physiology at the University of California at Los Angeles. He is also an accomplished author who was awarded the Pulitzer Prize for his book *Guns, Germs and Steel* which covers his favorite topics about the earth and the environment and the challenges that faces mankind and its never-ending struggle to survive and not be a victim of environmental collapse.

Jared took advantage of an invitation by the Teller Wildlife Refuge in Bitterroot Valley. He brought his twin sons and taught them to fly-fish. His family continued to spend time in Montana every year. Although some very wealthy people have relocated to Montana, it is one of the poorest states in the nation. He came to see the beautiful area as threatened as other regions of the nation and world. Its remoteness and beauty did not spare it from risk. Jared Diamond remained connected to Montana and the Bitterroot Valley the rest of his life. He is dismayed that his safe haven faces the same environmental problems that the world faces: increasing population, immigration, poor water and air quality, risk from toxic waste and wildfires, and issues with deteriorating forests and climate change.

Joaquín Balaguer

After a period of instability following the assassination of Dominican dictator Raphael Trujillo in 1961, Joaquín Balaguer was elected president in 1966. Balaguer had been helped to his office by ex-Trujillo army officers who terrorized Balaguer's opposition. Although he helped reach office by somewhat violent means, he became a sincere leader who took his responsibilities seriously.

Balaguer remained a dominant figure in Dominican politics for years to come, even after he was no longer president. His first term as president was from 1966 to 1978 and was re-elected from 1986 to 1996. He was genuinely interested in the welfare of the Dominican Republic and its people. His last contribution to the country he loved was in 2000 when he rescued the natural reserve system of the country. At the time, Balaguer



was 90 years old, blind, sick and two years short of death. He was devoted until the end.

Balaguer understood the importance of preserving the natural resources of the Dominican Republic. Logging had decimated the woodlands and had increased until Balaguer took office. He had the foresight to understand that the forest watersheds had to be maintained to meet energy demands. He banned all logging and used his military to enforce that ban. He issued many executive orders to protect the woodlands and the farmland.

Raphael Trujillo

Raphael Trujillo was the chief of the Dominican Republic police as well as the head of the nation's military. He became President of the Dominican Republic in 1930 and went on to become the dictator who remained in power for over thirty years. He was hard-working and clever and actually recognized environmental problems and took steps to correct them. But he was a narcissist and consumed with self-interest and greed. He eventually controlled most of the country's economy. He took a cut out of every industry including ten percent from prostitutes. Although he was behind some positive steps in protecting the Dominican woodlands, he was a cruel dictator. In 1961, Trujillo was assassinated in a car chase. Apparently the CIA was involved.

Stan Falkow

Stan Falkow, Professor of Microbiology at Stanford, had only lived in urban areas. A friend noticed his that his stress level seemed to be rather high and suggested that he needed to relax and try fly-fishing. He purchased a second home in Bitterroot Valley, Montana, around his fiftieth birthday. He was dismayed by the trajectory of his career and a divorce and wanted a place where he could relax and fly-fish - a sport he found to be a great stress reliever. He had been amazed by the beauty and vastness of the Montana countryside. He had originally come there on a request to evaluate a research lab located in the Bitterroot Valley but he was hooked and continued to seek refuge in the Bitterroot Valley whenever life got too stressful. He is an example of the many well-to-do "outsiders" who have moved to Montana or bought second homes there.

Charles Schwab

Charles Schwab the wealthy stockbroker purchased the 2,600 acre farm called the Bitterroot Stock Farm that was once owned by copper magnate Marcus Daly. Schwab had the farm transformed into a series of plats for large estates for the wealthy along with an 18-hole golf course among other recreational features. The beauty and peacefulness of Montana drew Schwab and many other wealthy people as a refuge from the rat race.



Rick Liable

Rick Liable was a newcomer to Montana. He was born in Berkeley, California, and was a manufacturer of wood store fixtures. He and his wife decided to semi-retire, drove around the west and bought a ranch in Bitterroot and later bought a house near Victor. His wife raised Arabian horses on the ranch. Out of their five children, only one son wanted to move to Montana. The other four “didn’t get” Montana. He was convinced by a friend to run for state assembly with a platform focused on forest management. Just a few decades before, Montana had been in the top ten state economies but had fallen to 49th. Liable felt that many problems facing Montana’s environment could be fixed through forest restoration.

Ivar Bardarson

Ivar Bardarson was sent to Greenland in 1341 by the Bishop of Bergen to be an overseer of the colony after it had accepted Norwegian rule. The Bishop returned to Norway with a report that described all of Greenland’s churches. Apparently the bishopric wanted to have more control over the churches as they had successfully done in Iceland. Prior to their acquiescence to Norwegian rule, the Norse Greenlanders had been considered pagans. They converted to Christianity so that they felt a closer identity with Europeans and to ensure that trade with Europe would continue.

Claudio Cristino

Archeologist Claudio Cristino had taken on the difficult challenge of re-erecting the fifteen toppled statues on the largest platform – the Ahu Tongariki – in the Rano Raraku crater on Easter Island. To pull the fallen statues up, he had to use a crane that could lift a load of 55 tons. Despite this new machinery he was not able to re-erect one of the statues that weight 88 tons. It was a mystery how the Easter Islanders were able to lift and move these huge statues, some of which are found in outlying areas of the island.

Stephens and Catherwood

In 1839 a wealthy American lawyer named John Stephens and an English draftsman named Frederick Catherwood discovered the hidden cities of the Maya society. An influential man, Stephens who had heard of the hidden cities got U.S. President Martin Van Buren to appoint him to be ambassador to the Confederation of Central American Republics. Stephens and Catherwood found and explored a total of forty-four sites and cities from the ancient society.



Bishop Diego de Landa

Bishop Diego de Landa lived in the Yucatan Peninsula from the years 1549 to 1578. In an inexplicably short-sighted act, he burned all Maya manuscripts that he could find to eradicate the paganism from the culture. He only missed four manuscripts that were eventually translated and provided clues about the Mayan culture.

Erik the Red

In circa A.D. 980, an Icelander named Erik the Red was defeated in an internal war and exiled to another island that he named Greenland. There was speculation that he purposely misnamed the island “green” because most of it was “white” from ice and snow in an effort to get people to come there. Erik the Red wound up staying in Greenland and established the colony of Greenland. He is credited with establishing the Christian religion in Greenland.

Einar Sökkason

During the 1100s, the Greenland chief’s son Einar Sökkason swore to defend Bishop Arnald and the church properties of Greenland. Arnald had been dispatched to Greenland to become the first Bishop of Greenland. Einar Sökkason in a violent dispute in which the Bishop was involved was killed by his opponents. Einar’s story is told in “A Typical Week in the Life of a Greenland Bishop: The Saga of Einar Sökkason” which became part of Norse literature.

Bishop Arnald

Bishop Arnald was the first Bishop of Greenland. He was dispatched to the Norwegian colony after a request from Greenland clergy to assign a bishop. The Norse Greenlanders were anxious to have a bishop so that they would feel a closer connection to Norway and European Christians. Arnald was the first of nine bishops sent to Greenland.



Objects/Places

Montana

Known for his beauty and vastness, Montana is the third largest in area and sixth smallest in population size of the lower forty-eight states. It is called Big Sky Country partly because there are no buildings to get in the way of one's view of the horizon. The population trend is flat even though Bitterroot Valley has an increasing population, eastern Montana is experiencing a falling off in its population. There are wealthy people who have homes in Montana but Ravalli County is one of the poorest counties in the state and Montana is among the poorest states in the nation. The federal government owns twenty-five percent of the land which has been declared a national forest.

Water quality has also suffered in Montana. Erosion, construction, fires logging and decreasing water supplies have impacted water quality. Remnants of fertilizer used by farmers end up in the water. Waste from septic tanks and toxic materials from mines do as well. Air quality is a slight though growing problem in Missoula. The introduction of non-native species has caused the loss of native species that include fish, deer, elk and weasels. Bull trout and Arctic grayling have declined because of the loss of water, warmer temperature, overfishing and competition from newly introduced species.

Northern pike are predatory fish and have been introduced into Montana lakes and rivers who want to catch them. They are voracious fish eaters and are a threat to native species. The whirling disease has spread throughout the western U.S. which originated from the stocking of Fish infected with the parasite. Another disease introduced into the wildlife in Montana is chronic wasting disease (CWD) which impacts deer and elk is thought to be able cause an incurable human disease. Spotted Knapweed and Leafy Spurge are two introduced weeds that have spread widely and took over native grasses by poisoning them. They're only weeds but they cause over \$100 million in damage a year in Montana alone.

Bitterroot Valley

The beauty and vastness of the Bitterroot Valley in Montana drew Stan Falkow, a Professor of Microbiology at Stanford University. He was there on business but was so impressed with the pristine valley that he decided to buy a second home there. It was a place where he could also pursue his love of fly-fishing which he found to be a relaxing stress reducer.

People build expensive homes in Bitterroot that are surrounded by forests that are vulnerable to fire and expect the government to protect them against fires. When fires were raging away, the Forest Service obeyed their directives to save people, people's property and forests in that order. While they helped to put out the houses on fire,



valuable forests worth way more were in flames. Many Montana homeowners are anti-government yet sue the government when their houses burn.

In Bitterroot there are 28 small privately owned dams that store snow melt for irrigation. The dams are in poor repair and if they break will flood homes and property. The Forest Service has deemed the owners of the dams as liable for any damage caused if they collapse. Most dams are in ill repair and many have been abandoned completely. They are ticking time bombs. There was a huge controversy over the Tin Cup Dam which began to leak. Arguments and lawsuits ensued as to who was responsible for it. The owners wouldn't spend the money to fix the dam and it was a threat to the very lives of the people in the town of Darby. The U.S. government repaired the dam and is suing the owners for the costs. Wells depend on aquifers deep in the ground but their sources of water are the same as those that supply the irrigation systems and lack sufficient water as well. Bitterroots population increase is a further strain on the water supply. Water supply is not a consideration when a builder submits a request to develop land for a housing tract.

Part of the Bitterroot valley has been transformed into a playground for the rich. Large home site plats, a golf course and other attractions lure the wealthy who arrive in private jets and helicopters.

Clark Fork River, Milltown Dam, and Pegasus Zortman-Landusky Mine

In 1882, a number of mining companies merged to become the Anaconda Mining Company in Butte near Clark Fork of the Columbia River. Huge quantities of toxic waste flowed into the river. Anaconda was bought out by ARCO which closed the operation in 1983. Clark River is the largest and most costly Superfund cleanup site in the U.S.

Due to toxic debris in the Milltown Dam, fish are prevented from migrating into the Clark Fork and Blackfoot Rivers. The dam is in disrepair and should it break, toxic water would flood the water supply of Missoula creating totally undrinkable water.

The Zortman-Landusky Mine was owned by Pegasus Gold. They used a process known as cyanide heap-leaching to extract low-quality gold ores. Cyanide (the same as used by the Nazis in poison gas chambers) is sprayed into the piles of ore which expels the gold ore. The unused cyanide is sprayed in nearby forests or open land or reused with added cyanide. Toxic waste also runs off the piles of ore and into the environment.

The Clearcut Controversy

The Clearcut Controversy began when citizens complained about the wholesale cutting down of trees. The Bolle Report issued in 1970 criticized the National Forest Service for its policies. Since that report sales of timber from Montana has decreased by eighty percent. Proposals for logging deals are bogged down in the courts and by protests.



Most of the Bitterroot's timber mills have been closed down. Plum Creek Timber Company is the owner of the largest private timberland in Montana and claims to operate under sustainable forest and environmentally sound practices. However, many locals feel that the company is more concerned with making money. Montana's high, dry climate is not ideal for forestry growth.

Easter Island

Easter Island was discovered by Dutch explorer Jacob Roggeveen on Easter Day, April 5, 1722. It was then a mystery how the Polynesian islanders who inhabited the island got there. Roggeveen was just as puzzled with the statues – how and why they carved them and how they moved them. How did they feed that large crew that would have been necessary to do all the work it took to make the statues on an island that had only insects and chickens? The layout of the island suggested a sophisticated society and economy. The Europeans wondered how savages could have created all the statues. Some thought the island had been inhabited by advanced civilizations connected to South Americans or Egyptians. Still other wondered if aliens had landed there.

Easter Island is the single most remote land in the world. The nearest land to the island is Chile which is 2,300 miles away in the east and the Pitcairn Islands of Polynesia are 1,300 miles away to the west. Rano Raraku is a volcanic crater that is 600 yards in diameter. Jared Diamond traversed the exterior of the volcano and the interior down to the marshy lake that is found on the volcano's floor.

The Norse

Vikings are famously known for having been adventurers and explorers. But they were also farmers, traders and colonizers. Vikings who settled in Europe and the British Isles eventually blended in with the locals. They were instrumental in forming the nation states of Russia, England and France. Vikings did not succeed in their attempt to settle North America or Greenland. The Iceland colony struggled for years but finally emerged as a successful and affluent society. The different fates that these Viking colonies faced were environmental rather than ancestral.

The Norse depended on raising domestic livestock and hunting wild animals. While pigs provided the most popular meat in Norway, pigs proved to be destructive to Greenland's fragile vegetation and poor soil. Horses were brought in for transportation only since the Christian religion forbade the eating of horses. Although goats, sheep and cows started out in roughly the same numbers, the sheep and goat population quickly began to outnumber cows. Barns used in those early days where cows were kept have been uncovered by archeologists. Cows were used for their milk and cheese. Goats were kept for their hair and sheep for their wool. The animals were ultimately used for food.



Pueblo Bonito

Pueblo Bonito was erected in the Chaco Canyon by Native Americans sometime after A.D. 800. It was a ceremonial house and was the governing entity of the people. Archeologists have determined that Pueblo Bonito was inhabited for several centuries. The last construction to be made at Pueblo Bonito was sometime after 1110. It marked the end of the great house's expansion and showed evidence of strife and violence.

Mesoamerica

The Mayan society was part of the larger ancient Native American culture known as Mesoamerica. This region covered the area from what is now Central Mexico to modern-day Honduras. It was one of two New World civilizations that were the advanced cultural centers in the Americas before the Europeans came.

Starvation/Cannibalism

Starvation was a common thread weaved throughout the history of failed societies. What also occurred when food was completely depleted was cannibalism. Archeologists found signs of this practice in the digs in Easter Island, the Polynesian Islands and in the Anasazi society. Starvation is a problem in some African nations and in some island nations but there is no hint that cannibalism has been resorted to.

The Bottom Up and the Top Down Approaches

There are several approaches that a community and government leaders can take in combating environmental problems that are damaging a nation or city. The top down approach is accomplished by a government or ruling agency and is usually the solution for larger communities. The government agency has a sense of the entire city or community and what is best for it. And it has the resources to support the plan.

The bottom up approach originates from the people. People in a community recognize a problem, put their heads together and devise a way to solve it. This works better in small towns and communities and on projects that are not expensive to fund.

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Themes

Deforestation

The logging industry is important for society. It supplies lumber and paper. The logging began in 1886 and surged during the post-WWII housing boom. Harmful DDT was sprayed on the forests to eliminate insect damage to the trees and later was banned. The clear-cutting of all trees has an environmental impact on streams, fish, irrigation, sediment runoff and decreased water quality.

Deforestation, or the destruction of woodlands in a nation, is one of the most severe problems impacting the environment and that faces every nation. Wood is a renewable resource; however, regrowth is slow and the cutting of trees must be done with a recovery plan so that the woodland is not destroyed. When a forest is mowed down, the soil is damaged causing erosion which sweeps away soil rich in nutrients that further delays regrowth and causes more problems beyond the woodland. The majority of cultures that have failed have been negligent in protecting their woodland resources. Deforestation is one of the key factors in the collapse of a society. However, deforestation is not a problem of the past; it is a problem of the present and future. Woodlands are being stripped and destroyed for short-term profit with no thought about long-term needs and demands.

One of the most severe problems that impacts the environment around the globe involves the soil. Deforestation is one of the main contributors to erosion and the destruction of soil. Excess salt in soil water called salinization has reached levels higher than seawater. Salt can have a toxic impact on crops with an impact that is similar to damage due to drought. Salinization was one of the factors that brought down the ancient civilization of Mesopotamia. Saline seep has created more problems in Montana and the northern Great Plains. It occurs when salinization levels in uphill in fallow areas virtually overflow and deluge lower areas with excess salt. Crops grow poorly or not at all in areas affected by saline seep. The run-off can seep into irrigation water and impact farmlands even far distances away. Another form of salinization occurs from an industrialized method of extracting methane for natural gas from the soil. Soil erosion and other soil problems are directly tied to deforestation.

Seventy percent of all wood cut in Indonesia comes from illegal operations costing the government a billion dollars a year in taxes, revenues and lease payments. Local permission is done through bribing village leaders. The money paid in bribes and entertaining the leaders is well worth it since one tree from a rain forest is worth thousands of dollars. Local people sometime rebel and block the access roads. Threats are made to locals who work with the logging company. Logging companies behave the way they do because of economics, the industry culture and the complicit societies and governments. The people in these villages are poor and are desperate for making money any way they can. In Europe and the U.S. logging companies harvest their own property or have long-term leases established with private landowners. Consumers are



more sophisticated and understand the problems that deforestation causes. The government regulates their processes and bribery is not a part of the system. It is difficult for these companies to compete with the logging companies in the Third World.

The consumption of wood is increasing although half the world's forests have been cut down over the last 8,000 years. The Forest Stewardship Council (FSC) was established by environmental and societal organizations to set criteria for forest management and set up a supply chain so that the consumer will know if a product came from a properly managed forest. Certification is only granted after a two-week in-person inspection. Having the certification opens up opportunities for logging countries. The vast majority of consumers claims that where wood comes from matters. Certification does not add to the cost of the product. Most large companies participate in the FSC certification process. Another certification known as LEED (Leadership in Energy and Environmental Design) rates the green building standard and environmental design of construction materials. The majority of first world countries participate in the certification of timber. Some companies have established weaker self-certification processes but the public's trust in them is yet to be determined. People are aware but it remains to be seen if the public, governments and business can come together to ensure that Earth's woodlands are protected and will thrive for future generations.

Mining

Just like logging, mining is an important industry in that the metals, ores and coal that is mined are needed and in demand by the people of the Earth. There are hardrock mines and mineral mines like coal and bauxite. What they have in common is the pollution that they inflict into the air, water and soil. Mining is also a dirty operation and cleanup is very expensive.

U.S. taxpayers currently face a bill of \$12 billion to clean-up all the abandoned hardrock mines. Naturally there is push back from U.S. taxpayers and the future of hardrock mines in the U.S. is uncertain. Fewer young people are interested in a career in mining and public opposition to them is growing. The mining industry has for a century been interested in only its short-term profits. They were not concerned with their long-term chances which is catching up with them. Clean-up costs are more of a burden on the mining industry than the oil industry. Mining companies deal with lower profits, higher clean-up costs, longer-lasting pollution costs, and the inability to recover costs by passing them on to consumers, less operating capital, more waste and a different work force. Also thrown into the mix are the fluctuating prices of ores like gold and other metals.

It's cost-effective for mining companies to pay lobbyists to try to deregulate their industry, especially when it comes to clean-up responsibilities. Mining companies also have a sense of entitlement that reflect a set of values that have outlived themselves. Mining company executives are stuck in the past and choose to ignore current day problems with the industry. They are at stage two when the problem has emerged but it's ignored. Unfortunately, the U.S. government is in the past as well. It governs mining



operations by the General Mining Act of 1872. Sweeping changes in the mining industry that would require more regulation and more responsibility on the mining industry's side to protect the environment was eliminated by the incoming Bush administration in 2001.

Galactic Resources operated a gold mine in Colorado which they closed up with hardly any notice. Ultimately the mine overflowed and sent dangerous levels of cyanide into the Alamosa River. The cleanup was \$180 million of which U.S. taxpayers paid \$147.5 million. Although most mining companies are compelled to guarantee payment of clean-up costs, company estimates are generally much lower than actual costs which are covered by taxpayers.

There are bright spots in the Montana mining industry. A platinum and palladium mine owned by Stillwater Mining Company entered into "good-neighbor" agreements with local government groups to ensure that the footprint on the environment is as light as possible. The owners of Stillwater did not feel privileged and wanted to find fresh long-term solutions to environmental concerns that would allow them to operate their mines profitably but responsibly. Top executives of the world's largest international mining companies formed an initiative called the Mining Minerals and Sustainable Development project that involved the environmental community in their efforts to operate responsibly. The borax mine in California's Death Valley is the most cleanly operated mine in the nation.

Although DuPont is not a mining company they involved themselves in environmental groups that advocated safe practices because the company uses titanium which is mined in Australia in DuPont paints. Since the hardrock mining industry is not a transparent process, consumers have no clue about who to protest against or boycott because the supply chain from mine to their product is a long and circuitous one. However, consumers can put pressure on retailers and have an impact on the products they have for sale.

The Tale of Two Oil Companies

Large swathes of the woodland on Salawati Island, off the Coast of Indonesia New Guinea, were mowed down to make access roads to Pertamina Oil Company's operation at the center of the island. This action impacted the habitats of rainforest mammals, birds, frogs and reptiles. Chevron's oil operation on another Papua New Guinea was nearly invisible because they had worked closely with the World Wildlife Fund (WWF) who prepared a conservation and development plan for the region. The access road leading to this oil field was so narrow that it was barely perceptible from the air. Chevron's operation left barely a footprint on the rainforest. In fact, the species within the protected Chevron area thrived more successfully than on other areas of the island. Coordination between Chevron, WWF and the local government that enforced the standards developed by the WWF was a group-think that worked for the benefit of all involved.



Chevron's motivation in its operation on Papua was complex. Chevron had a genuine interest in not damaging the environment. It also made dollar sense because a use environmental disaster is costly. There are many examples of this – the Exxon Valdez, Occidental Petroleum's North Sea disaster that killed 167 people and Union Carbide's Phopal chemical tragedy that killed 4,000 people and injured 200,000. Many oil companies have sophisticated forecasts that predict oil field disasters allowing the companies to take measures to avoid them or at least prepare for them. Another motivator for taking care with the environment is the PR factor. Everyone has been disturbed by the oily birds and animals who are victims of spills and accidents. Oil spills also disrupts the lives of the local people which causes another hit on the company.

In the Papua operation, the government kept track of trees cut down and charged the company for them. Chevron has also benefited from their approach by appealing to new customers who appreciate their interest in protecting the environment. The majority high ranking executives as well as supervisory personnel who work in the field for Chevron and other large oil companies are sophisticated and highly educated and well aware of environmental concerns. New technology and methodology have made it easier for oil companies to comply with demands by environmentalists and local governments.

The oil industry as a whole has many problems to address and find solutions for. They include oil spills from poorly maintained tankers, dirty old facilities and operations that are run under corrupt governments who have no interest in protecting their environment. The difference in the results of the Pertamina and Chevron operations has to do with expectations. More is expected of an international oil company.

Signs of Modern Collapse

There is reason for optimism that the modern world will take heed to the failures of yesteryear. Take the case of Los Angeles, California, USA. Most environmental problems facing Los Angeles are mild relatively speaking. Smog, over-population and traffic congestion notably are ongoing problems. The cost of real estate is exorbitant and commuter distances are long. Immigration is increasing the population in Los Angeles and throughout California. Third world immigrants come to Los Angeles to transform their lives. Los Angeles is one of the top cities in energy consumption. Wildfires are always a threat to Southern California; the period that encompasses late summer and early fall is actually called "fire season." Alien species that have been introduced into the area are also threats to the environment. The soil suffers from a degree of salinization as a result of agricultural irrigation. Fresh water supplies are always low due to the lack of substantial rainfall. Fisheries in northern and southern California have collapsed causing higher prices at the fish market. Losses of biodiversity have impacted Southern California's species. The California Golden Bear which is the symbol of the state is extinct. Its sea otters were exterminated and several bird species have disappeared.

There are no viable proposals on the table to solve any of these problems. Some who are opposed to doing anything about these problems offer weak excuses like taking



steps to help the environment is a luxury, that the problem doesn't merit the cost. These same people are not looking at the costs caused by these issues that the region is absorbing. Some slough it off and claim that technology will solve the problems so day. There, of course, are no guarantees and as problems grow in intensity they could reach a point of no return. Countless technologies have been developed and failed in its application. And for those who fear that fixing the environment is too dear, the cost of developing the technology to combat this fix overwhelms that cost. Another excuse for inaction is that if once resource is exhausted, there are others to take its place.

The car industry is developing electric and hydrogen cars that would help to solve the air pollution problem in Los Angeles. But a widespread use of these vehicles is decades away. Hybrid cars that use gas and electricity are on the streets of LA but only represent a minority of the vehicles on the freeways. After oil prices settled down, the car industry began developing large SUVs. Los Angeles, and America in general, cannot give up its love affair with big gas-guzzling cars. Wind and solar energy are being developed as energy sources but are viable only in areas that have reliable wind and sunlight.

First World v. Third World

Some claim that there is no world food supply problem – only an effective means of transporting it to where it is needed. Also there is the belief that the Green Revolution will virtually solve all environmental problems. People in first world nations are not eager to share their food supply with people of the third world. Malthus's dilemma comes into play because current trends indicate that the population will surpass the food supply. Another claim is that things are better than they used to be. There are plenty of positive sounds – green grass, supermarkets loaded with food, clean water to drink. Where's the sign of collapse?!

First world citizens have been seeing improvements. However, that is not the case for people of the third world. There are also growing levels of poverty in the first world and worsening problems in third world nations. Just like individuals who spend more than they make, first world countries are racking up heavy debt at a rate that is not sustainable. The end may not be far away; the Maya, Anasazi, Easter Islanders and other societies throughout history collapsed just decades after they reached their peak.

Some of the warnings that environmentalists espouse may not occur. But just like the small town that has a fire department that is never used, they aren't wise to get rid of it. It's better to be prepared to combat a potential problem, or put out a fire, rather than be caught by surprise and let the buildings burn down. Others use the excuse to not prepare for crisis by claiming that the world's increase in population is declining and that it'll all balance out. Even today's population exists at an unsustainable level. Others say that the world can accommodate indefinite any volume of population growth. The countries with large populations are disproportionately poor. Solutions for the poor and starving are not forthcoming now. What happens when there's more poor people?



Some first world residents feel that they should not try to subject third world countries to the same standards as first world residents. This frame of mind demonstrates a complete misunderstanding of improving the environment and how essential it is that the third world be included in solutions. Global warming, the deterioration of the coral reef, air pollution and toxins in the waters know no boundaries. The excuse that environmental catastrophe is far off and won't affect the world's current population is probably the most inane. Some environmental crises are currently occurring while others are estimated to have an impact soon. Those with this excuse are shortsighted and seem to have no consideration for Earth or for their children, grandchildren and generations to come. Another excuse is that modern-day societies are more responsible than those of the Maya and Anasazi and other societies that failed.

Those old societies did not have the technological advances of modern ones. People are more aware of the dangers of environmental crises. It won't happen to us is a sentiment that is often heard. There are big differences between ancient and modern cultures. There are differences that give modern societies challenge that ancient ones did not have – population growth and globalization. There are more people in a world that has been made smaller by technology, population growth and globalization. It was in modern times that genocide happened in Rwanda. The 9/11 terrorist attack of New York and Washington was in 2001 and was led by desperate people from third world countries.

The deforestation of third world countries is caused by first world demand. First world countries breathe the some polluted air that originates in China. Diseases start in remote areas of Africa or other nations – AIDS, Ebola, and West Nile fever. They don't stay in those third world countries. Problems in the Middle East bring in the U.S. Marines. A tsunami in the Indian Ocean causes death, casualties and destruction that the third world can't cope with alone and needs the help of the first world. The world is becoming increasingly interdependent. Every nation and every individual must live with the thought in mind that at least in the foreseeable future there is no other planet to turn to.



Styles

Structure

Collapse tells the stories of societies that mistreated their environment then failed and vanished and of those who knew how to protect and preserve their resources and were able to survive even during hard times. Collapse is separated into four main parts. Part One: Modern Montana, tells the story of the current environmental issues that are plaguing Big Sky Country.

Part Two: Past Societies, describes failed societies that collapsed due to their negligence in preserving their land and trees. The collapses of Easter Island; the Polynesian islands of Pitcairn and Henderson; the ancient societies of the Anasazi and other Native Americans in what is now the U.S. southwest; The Maya collapses; Viking settlements in Greenland, Iceland and Vinland that had mixed results; and, successes in Tokugawa Japan, New Guinea and Tikopia.

Part Three: Modern Societies, describes the starvation and ethnic hatred that led to war and genocide in Rwanda; the failure of Haiti and the success of the Dominican Republic, two countries that share the same island; China's negligence in polluting the Earth's waters and air; and, Australia's struggle for fresh water, its hope of becoming a world power and how the tyranny of distance limits its possibilities.

Part Four: Practical Lessons, discusses why some societies make bad choices that have dire results, how big business harm and help the environment and finally what the future may hold for Planet Earth.

There are several maps and illustrations throughout the work to help understand the locations that Diamond describes.

Perspective

Collapse – How Societies Choose to Fail or Succeed by Jared Diamond is written in the first person and narrated by author Jared Diamond who has taken part in many field studies and research on the subject of the failure and success of cultures and on the impact of a society's impact on the environment. Diamond is a scientist with a focus on ecology, evolutionary biology and anthropology among other disciplines. He is a professor of geography and physiology at the University of California at Los Angeles.

In his narration of this lengthy study of why some societies and why some fail, Diamond displays his knowledge of the fields with which he has intimate knowledge and describes his many trips to the places he writes about so that he has first-hand knowledge of the nation and the people. He is careful to describe what is actually known about past societies versus what is speculation. He shows his respect for current societies that are struggling to stay afloat whether they are first world or third world



nations. Diamond repeatedly demonstrates his understanding of human behavior while urging that changing behaviors can have a tremendous impact on turning debilitating trends around.

Jared Diamond has also had great success as an author. In addition to *Collapse* he has written best sellers that focus on nature and the environment that include *The Third Chimpanzee*, *Guns, Germs and Steel* for which he was awarded the Pulitzer Prize and *The World Until Yesterday* which is his most recent work.

Diamond's background, experience and his interest in educating the public on the crises facing the environment and solutions for them demonstrates a genuineness that comes through the pages and connects with the reader.

Tone

The tone of *Collapse* is one that is highly respectful of the Earth and all its resources. Jared Diamond is a forgiving man; his high regard for all things Earth extends to mankind which has caused the majority of the damage to the environment he loves. By the time one finishes with *Collapse*, the reader develops a tender spot for Mother Earth if it had not been there already. The brutal treatment that man has inflicted upon nature goes back to the earliest societies that can be studied. The lesson to be learned that Diamond gently offers is that in the end, Mother Earth always wins, despite the scars and wounds inflicting upon her by man.

Jared Diamond is a professor of geography and physiology at the University of California at Los Angeles. He also has vast experience and interest in the environment, ecology, anthropology and evolutionary biology. Blending his experience, interest and educational background Diamond gifts the reader with an erudite tale of survival, failure and collapse. He instructs us that the calamities of the past are the risks of the present and the warnings of the future.

Diamond's scientist bona fides are evident in the passages which are given to great detail and explanations that have their basis in scientific disciplines. However, he does not over indulge in technical speak but provides just enough for the reader to know that he's a serious scientist and what he writes about has its foundation firmly implanted in science.



Quotes

Fiftieth birthdays make many of us reflect on what we want to do with what's left of our lives."

-- Stan Falkow (chapter 1 paragraph 3)

Importance: Professor Stan Falkow was explaining why he purchased a second home in Bitterroot Valley, Montana. It was a place where he could relax, pursue his love of fly-fishing and relieve his stress. It happened around his fiftieth birthday which was a pivotal point in his life.

Do not flush. Be like the mining industry and let someone else clean up your waste."

-- Sing on wall (chapter 1 paragraph 26)

Importance: A sign with the above message was posted over the toilet in the bathroom of a Montanan resident. It was a not-so-subtle commentary on how Montanans view mining industry and their negligence in not cleaning up their toxic waste.

The ghostly impression that the quarry made on me came from my sense of being in a factory, all of whose workers had suddenly quit for mysterious reasons, thrown down their tools, and stomped out, leaving each statue in whatever stage it happened to be in at the moment."

-- Jared Diamond (chapter 2 paragraph 4)

Importance: Jared Diamond visited Easter Island and was amazed by the hundreds of huge stone statues that had been carved centuries ago. The statues were in different stages of completion but suddenly all worked stopped. The reason for the workers abandoned their statues is not known.

They [Henderson islanders] survived in ways that strike me as a mixture of ingenious, desperate and pathetic."

-- Jared Diamond (chapter 3 paragraph 31)

Importance: Diamond was describing how the island people of Henderson, the most remote of the Polynesian Islands, survived after trade and inter-oceanic traveled stopped between it and other islands that possessed more natural resources than did Henderson.

The Anasazi collapse and other southwestern collapses offer us not only a gripping story but also an instructive one for the purposes of this book, illustrating well our themes of human environmental impact and climate change intersecting, environmental and population problems spilling over into warfare, the strengths but also the dangers of complex non-self-sufficient societies dependent on imports and exports, an societies collapsing swiftly after attaining peak population numbers and power."

-- Jared Diamond (chapter 4 paragraph 4)



Importance: During the discussion of the collapse of the Anasazi in the Southwestern United States, the author captures the heart and soul of the premise of his book.

Some historians think that the name [Greenland] really was coined with deceitful intent by Erik the Red, found of Greenland's Viking settlement, so as to induce other Vikings to join him."

-- Jared Diamond (chapter 7 paragraph 1)

Importance: When Jared Diamond flew over Greenland on his visit he saw only the blue water that surrounded it, the huge white icecap that encompassed most of the island and the black mountains that rose out of the white. He saw no green at all.

It's hard for anyone who has not actually lived on the island to realize its isolation from the rest of the world. It is so small that one is rarely out of sight or sound of the sea."

-- Raymond Firth (chapter 9 paragraph 27)

Importance: Raymond Firth who lived on the island of Tikopia for a year described his reaction to its small size. Tikopia has been continuously populated for nearly 3,000 years. Their survival is attributable to their bottom up approach to their economy and the community's success.

When population grows, the extra people added to the population also themselves reproduce, as in compound interest, where the interest itself draws interest. That allows exponential growth. In contrast, an increase in food yield does not then further increase yields, but instead leads only to arithmetic growth in food production. Hence a population will tend to expand to consume all available food and never leave a surplus, unless population growth itself is halted by famine, war, or disease or else by people making preventive choices (e.g., contraception or postponing marriage)."

-- Jared Diamond (chapter 10 paragraph 4)

Importance: The author explains why a population boom is a challenge to the food supply. They do not grow at the same rate and unless steps are taken population increases can lead to a short food supply and in third world countries starvation.

China's large population, economy, and area also guarantee that its environmental problems will not remain a domestic issue but will spill over to the rest of the world, which is increasingly affected through sharing the same planet, oceans and atmosphere with China, and which in turn affects China's environment through globalization."

-- Jared Diamond (chapter 12 paragraph 3)

Importance: The author explains why practices that damage the environment are felt around the world especially by a country like China leaves a huge footprint on the rest of the world.

Education is a process involving two sets of participants who supposedly play different roles: teachers who impart knowledge to students and students who absorb knowledge from teachers."



-- Jared Diamond (chapter 14 paragraph 1)

Importance: Author Diamond is making the point that learning is a failure if the knowledge that the teacher provides to the student is ignored or not applied.

Complex societies are characterized by centralized decision-making, high information flow, great coordination of parts, formal channels of command, and pooling of resources. Much of this structure seems to have the capability, if not the designed purpose, of countering fluctuations and deficiencies in productivity.”

-- Joseph Tainter (chapter 14 paragraph 3)

Importance: Archeologist Joseph Tainter in his book, “The Collapse of Complex Societies,” describes the characteristics of a successful society that has an inherent ability to withstand unexpected disasters and change.

Big businesses, environmentalists, and society as a whole coincide more often than you might guess from all the mutual blaming. In many other cases, however, there really is a conflict of interest; what makes money for a business, at least in the short run, may be harmful for society as a whole.”

-- Jared Diamond (chapter 15 paragraph 3)

Importance: Author Diamond makes the point that while there are areas of agreement in the activities of big business and environmentalists that profit sometimes is the short-term goal of corporations over the long-term welfare of the community.



Topics for Discussion

1

What environmental factors limit Montana's ability to raise livestock and grow crops? Why did the first Native Americans who resided in Montana remain hunter-gatherers rather than begin to farm and raise livestock?

2

What factors have impacted the timber industry in Montana? Why has there been an increase in forest fires in the state's forest land? What is the natural role of fire in a healthy forest?

3

What were the four factors that allowed Easter Islanders to carve and erect the large amount of statues and platforms in all of Polynesia? Why did these elements facilitate their statue-building goals?

4

What factors affect deforestation in the Pacific Islands? Why was Easter Island the hardest hit?

5

Describe the relationship between three islands of Polynesia: Pitcairn, Henderson and Mangareva. What resources did each of the islands have to offer? Why did the decline of one island impact the others?

6

What are the four main environmental variables that caused the Viking colonies of the North Atlantic to have different fates? Which ones succeeded and why? Which ones failed and why?

7

What are the author's five-point criteria that, in his opinion, made a tract of land on Greenland the site of a good medieval Norse farm?



8

What is Malthusian? Who developed this theory and what is it based on?

9

What did former Chinese leaders believe about man and nature? How does the desire that the ordinary Chinese person has to elevate their lifestyle to first world standards affect the world?

10

Australia's soil is the least productive of all the continents. What are the three major processes that can renew a soil's viability?