Thoughts on Sustainability

I. How can we build a more sustainable world in the face of an uncertain future?

A. Sustainability is subjective, therefore we must identify what to sustain, while simultaneously acknowledging there is uncertainty in everything.

a. Differences in values determines what we choose to sustain. Likewise, our responses and the actions we take differ based on our values.

i. i. People have different visions on how the world as a system should work because they have different future outcomes they would like to see occur based on precedents they put on a particular issue. (Sowell)

ii. A conflict of roles can lead to a flawed system. Differing opinions, more specifically visions, result in conflicts of interest and people overstepping their roles. (Hawken/Jacobs)

iii. In Yellowstone, there was a clear difference in values between the ranchers, whose livelihood was threatened by the possible diseases transmitted by Buffalo, and the buffalo hippies who intrinsically valued nature. (Ketcham)

iv. Values are transferable between people; an example of this is the penetration of European ideas and cultures into the Masai mind of Saitoti. (Saitoti)

b. The reasonable solution now may not be the correct solution for the next generation. There are uncertain fates to potential resolutions of sustainable progression.

i. We must embrace sustainable management because we are unaware of how the future may act, and it's no longer possible to manage systems like the past. (Chapin)

ii. Separate systems are connected indirectly, making it difficult to ascertain the faults in our systems. The connections between humans and the ecosystems of Guam were made apparent when the invasive brown tree snake infiltrated the ecosystem which affected humans and their own systems. This exemplifies the ambiguous connections that can majorly impact our world (Quammen).

iii. It is near impossible to predict how the components and interactions within systems will change. The boomerang kids face an uncertain future due to the economic recession. The typical lifestyle strategies chosen by previous generations no longer apply. (Newman)

iv. i. Often times in politics people may think fast and believe a decision is the right one even though it may lead to more drastic outcomes. (Kahneman)

ii. Systems thinking, and the ways in which it is conducted plays a crucial part in the decision making but there can sometimes be habit forming. In almost all cases, decisions must be site specific to tackle an issue by seeking the unobvious answer. (Jacobs)

iii. A seemingly obvious solution will often times cause greater problems like in the case of the Tata in overcrowded cities or the use of hydraulic fracking to produce fuel. (Owen)

B. Diversity increases interactions within environmental, economic, and social systems, in turn promoting change, leading to a greater balance.

a. Integrating diversity can provide the necessary disturbances that will lead to change.

i. Disturbances in diversity can be positive and negative. Problems associated with the brown tree snake in Guam can be seen as negative to some species such as the moth, but positive for some species such as the spider. By eliminating diversity instead of including it we not only change the ecosystem but we lose all balance in the system. (Quammen)

ii. During the tulip-mania in the early 1600's in Holland, the tulip is said to have exerted a decisive impact on human evolution because it is able to satisfy human's desire for

beauty. The positive disturbance that created a want for this flower lead to the co-evolution between humans and tulips. (Pollan)

b. Diversity incorporates more perspectives which allows for more of a bottom-up rather than top-down approach through enhanced communication.

i. a. A mix of diversity will provide the necessary disturbances to kick start change.

i. Ecosystems react to varying biotic and abiotic factors. The range of factors causes systems to
adapt, or change, to better fit their environment. (Andersen)

ii. If one species experiences decline, it allows for other species to become more dominant. These “sticky switches” come about from environmental, societal, or economic changes, and create the space for other species/people to have more influence and morph the system in some way. (Zimmer)

iii. The “Sustainability Revolution” is an example a disturbance that aims to encourage change. By starting at a local level and moving upwards, a change in the way people think and respond to sustainability efforts can make the difference that is needed. (Norton)

b. Diversity includes numerous perspectives, which builds a more inclusive and holistic approach through enhanced communication.

i. Critical thinking is an important skill, and the foundation for it should be taught early on. Through critical thinking, we can build a stronger society that questions things rather than accepting how things are. (Bartel)

ii. We need to work towards breaking down the culture of social topography, so that open discussions between people of different backgrounds and interests are more prevalent. By merging these social classes, there will be the emergence of ideas and solutions. (Johnson)

iii. The Watts-Strogatz model suggests that high connectivity of diverse systems increases communication and networks, which allows differing points of view to overlap. (Barabasi)

c. A major part of sustainability is the amount of diversity in every aspect of life. The wide variety of backgrounds/cultures, opinions, and thought processes foster innovation.

ii. There are a large number of ways that people are different from one another, and all of these forms of diversity play a part. In turn, this affects sustainability (positively or negatively) depending on how the diversity is approached and used. (Liswood)

iii. The combination of both unconstrained and constrained visions will play into the diversity on all accounts. With these different views, collaboration will include more ideas and options as to how we can improve sustainability. (Sowell)

iv. People are passionate about different things. These passions are important and should be used to design a sustainable world. If people aim to fix the pieces they are passionate about, we are more likely to achieve and create sustainable solutions, as saw with tulips. (Pollan)

v. The idea is to create meritocracy, a place where all diverse ideas are heard and people are promoted fairly, requires awareness of the differences of others and how we react to them. Diversity requires leaders to have more ideas than if they were managing a standardized workforce. (Liswood)

vi. Learning from the communication failures of the EPA, scientific communities can better solve problems and spread concepts and ideas. (Norton)

vii. A recent trend in TV narratives show increased complexity and multi-threaded storylines; these TV shows do a better job of communicating complex plots and themes by using multiple threads. (Johnson III)

C. Systems promote interactions, exchange information, and create connections that unite people. Natural systems provide a basis to understand and construct our own.

a. Natural systems have sustained for millions of years; the balance within a natural system offers insight into how we can sustain our own systems.

i. A system consists of elements, interconnections, and a purpose; elements of a tree include: the roots, trunk, branches, and leaves. The interconnections of a tree are chemical processes, such as when leaves close their pores to conserve water due to the signaling of water vessels. A tree changes its cells constantly, but it is still the same tree. The systems purpose allows the tree to survive and reproduce (Meadows).

ii. Dirt is a system and a component within a system. Soil evolves towards a balance between erosion and the rate at which weathering forms new soil; this makes soil a dynamic system. Additionally, due to the fact that it responds to changes in the environment, it's a component in a system. (Montgomery)

b. Networks move ideas from one individual to another empowering a system as a whole, proving the significance of unity among people.

i. The trade of goods and ideas was a sustained connection between the Native Americans and the colonizing Europeans. The establishment of trade between two different societies allowed for the development of new ideas for how to use resources. (Cronon)

ii. Through connections and networks, Priestley gained opportunities he otherwise would not have had access to. He became involved with electricians through his previously made connections from the school he tutored at. (Johnson I)

iii. Through international travel and new experiences, Saitoti experienced new values and ideas and was able to share his own; this strengthened international communication which was vital to the development of a functional community. (Saitoti)

iv. Saul shared the ideas of Jesus with everyone he met along his journeys. Although those he told were unaware of each other, they were linked indirectly through Saul and the network he created (Barabasi).

v. a. Natural systems provide a foundation and act as a model which we use to understand and construct our own systems.

i. This occurs because natural systems have evolved over millions of years to meet the demands of society over time (Meadows).

ii. A more personal example of this can be seen during our Pink Time discussions, where the exchange of information and ideas through the natural flow of conversation created an increased sense of interconnectedness throughout the class (Pink).

b. Networks move ideas from one individual to another empowering a system as a whole, proving the significance of unity among people.

i. This can be seen through innovations in technology such as the shipping container which have enabled a larger quantity of goods to be shipped at a faster rate (Murray).

ii. The implementation of this new technology has allowed for less economically developed countries to be able to ship goods from the primary sector, such as bananas from Central American countries (Koeppal).

c. These countries are able to further economically develop which increases the standard of living and influences societal norms which results in the creation of new networks.

i. Once a country becomes developed, they can afford new luxuries such as the ability to have a conversation about sustainability in the first place (Sowell).

ii. As a result, new opinions are formed and sides are usually taken depending on the topic at hand. Because of this, societal norms are influenced by the unconstrained or constrained vision that most people have in modern society (Sowell).

D. The key to sustainability is to enhance the resilience of a system. Resilience is the ability of a system to absorb disturbance and retain its structure.

i. The dynamics of a complex adaptive cycle create resilience to change, helping a system to turn disturbance into productivity. Natural ecosystems are resilient and fluctuate to balance themselves:

i. The Complex Adaptive Cycle (CAC) is a system's resilience when facing change. (Chapin)

ii. The ecosystems in the Everglades have to adapt to changes, and follow the CAC to deal with the changes. (Walker)

iii. The Plains resemble resilience when dealing with land use change, and so do the people that inhabit it. The Plains adaptation to change also follows the CAC. (Hylton)

b. In order to have a sustainable world we need to be able to evolve and adapt to uncontrollable changes, therefore, how society perceives this issue must be changed.

i. Thinking holistically and being proactive as a society is very difficult. There is a need for effective green marketing to create demand by offering benefits and incentives as well as designing products that balance quality of consumer and quality for the environment. (Ottman)

ii. Similar to how football was dying out in America, a new change to the audience's perspective made all the difference in reeling people back in. (Cohen)

iii. There is a need to educate the masses and change the way society thinks in the ways in which the world is connected and that being a citizen is not within borders but a citizen of Earth so we all must understand these are global issues and not just national issues. (Orr)

iv. To conclude, humans must evolve. Evolution is equal parts chance and choice, making a powerful combination to change and strengthen how our ecological and economical systems function; in other words, we must become more resilient. Failures can spark adversity leading to resiliency. Some of mankind's greatest feats have come from changing the way we act or think (Bartel)

The interaction of different system components creates competition which causes some to persist and some to die off. The survival of stronger system components offers itself as a sort of self-regulation, allowing the system to take care of itself.

ii. When interactions or components change, the entire system changes. When these changes coincide with system evolution, a healthy feedback loop is sustained. The ability of a system to adapt creates resilience. (Chapin)

b. Natural ecosystems are resilient systems that fluctuate and balance themselves out.

i. The use of the land in the Great Plains is changing due to human activity. For example, agriculture is responsible for the Ogallala aquifer is drying out. The heartland is resilient because of its ability to withstand the stress humans are putting on it- the land can balance itself out as it has been doing for millions of years. The land is going through the complex adaptive cycle, and by repairing itself and changing its function it is sustainable (Hylton).

ii. The Everglades is a complex ecosystem that has been shaped by a river and the change of water abundance in the area. Many of the animals that inhabit the Everglades are adapted

to the alternating wet and dry seasons. The ecosystem is resilient in the way it adapted to natural processes (Walker).

iii. Agriculture required more use and interactions with the land. This led to a severe change in the landscape, from natural to be molded by humans. The disturbance of the landscape was converted into productivity, making the landscape resilient (Diamond)

c. Evolution is equal parts chance and choice, making a powerful combination to change and strengthen existing systems; therefore, they become more resilient.

i. The introduction of small modifications into an ecosystem at a constant rate creates a productive system in which change is continually offering new methods that are the strongest suited for survival. The concept of natural selection helps a system to not only absorb disturbance, but also become stronger from said change. (Levin)

ii. Evolution depends on the connections in a system and changes are made advantageously due to system structure. The evolution of tulips depended on the value of beauty in the boring Dutch environment. Similarly, Cannabis evolved based on the value of intoxication. (Pollan)

II. What are the barriers to building a more sustainable world?

A. Inequalities in economic, social, and environmental systems create an imbalance of opportunities and knowledge available to spark the change necessary for sustaining the world.

a. Wealth disparity among countries and between citizens of those countries creates a situation in which the wealthy are at an advantage.

i. Wealth disparity among countries and between citizens of those countries creates a situation in which the wealthy are at an advantage.

i. Sustainability is not a greeny vs. non greeny issue, it is an economic issue. Giving foreign aid or not should not be seen as the end all be all answer. Fully understanding the scope of the situation must be experienced on the ground and interpreted as such. (Sachs/Diaz/Bannerjee & Duflo)

ii. One-quarter of the wealth in the US is held by the 1% of the population. There must be a fairly equal distribution of wealth from the bottom up rather than top down for an upside down pyramid is certain to topple without the foundation it needs to support it. (Stiglitz)

b. Social constructions create disparities among races, sexes, ages, classes, etc. that fragment the community, preventing the unity of people that is necessary for sustainability.

i. Unequal distribution of wealth is apparent due to the “separation of colors” between nations in the northern and southern hemispheres. We must construct our societies in a way in which any man, woman, color or race can succeed. (Rosling)

ii. Immigrants often times find themselves walking on eggshells when coming to a new country. Although opportunities are high, so is the risk of failing and pressure to succeed. Hispanics in America receiving lower pay on average than any other race in the country is one example in how a society segregates an entire group in the way in which it has been constructed. (Gill)

ii. Wealth determines opportunities such as education that can provide individuals with experience and knowledge. The only reason Saitoti was able to travel and learn was because of the support he received from wealthy Europeans. Neither he nor any of his tribe members could possibly afford that endeavor to learn and encounter different cultures. (Saitoti)

iii. The American Dream was an idea that symbolized the opportunities America could provide to those who wanted a better life. The economic and social opportunities in the U.S. were attractive to those in other countries where the same opportunities were not available. (Meacham)

iv. Wealth disparity has adverse effects on sustainability. For example, diversity in the workplace suffers when privileged wealthy white males are continually promoted to manager positions; this creates a system where few perspectives are considered in managerial decisions. Ultimately, systems that aren't diverse eventually fail. (Liswood)

b. Social constructions create disparities among races, sexes, ages, classes, etc. that fragment the community, preventing the unity of people that is necessary for sustainability.

i. Social differences lead to systems where certain ethnicities and perspectives are more prevalent in society which leads to lower diversity in the higher more influential classes. (Liswood)

ii. Social constructions often determine the way we view others. Negative associations with specific identities reduces understanding, trust, and compassion; these are key components of sustainable societies.

B. Change is possible with numbers, and uniting people is key to start the movement necessary for creating a sustainable world. Differences in values, behaviors, and beliefs among people fragment and complicate the progress.

a. Some will disagree that creating a more sustainable world is a priority, and may not believe that it's worthwhile to better the future. Their values could be economically driven, or their outlook may be focused on short term concerns.

i. Immigrants often come to the U.S. with the belief that they will earn higher wages. For these people, better pay equates to a better lifestyle and environment for their children. The focus may be on economic factors, but these factors allow for the improved environment. There needs to be a shift of values from economic to environmental. (Gill)

ii. Just as the colonists believed the land should be used for economic benefit while the Native Americans wanted to preserve the land, we face the same issue today. There must be a compromise between the two opposing views, and the result will be beneficial to future generations. (Cronon)

iii. Impoverished areas are less likely to care about building a sustainable future because of the issues they face every day. We first need to decrease poverty, if we hope create a world of economic, environmental, and societal sustainability. (Sachs, Easterly, Bannerjee & Duflo)

b. The difference and change of beliefs and behaviors between each generations will act as a barrier for sustainability. The older generations will be less likely to spend money and resources to change the future of a world they won't live to see.

i. Just as older generations have a different interpretation of the American Dream, they tend to also have a different view of sustainable methods. It is difficult to change someone's ways when they have grown up being told the opposite. It will be a gradual switch to an accepting attitude towards sustainable methods.

ii. Greed is not a new issue and is a learned habit. The Native Americans learned how to be greedy through trading with the Europeans, and eventually resorted to damaging the environment they once protected. This barrier to sustainability is not easy to overcome. (Cronon)

iii. Unconstrained and constrained visions can conflict, and can often vary between generations. The conflict of visions will be an obstacle when thinking of the future. The goal would be to get to a place where more people have unconstrained visions regarding the future, which may be difficult when it comes to older generations. (Sowell)

c. Insufficient funding from community members could inhibit the opportunity to change.

i. Inequality distorts social conditions and the economy, which affects how likely and able people are to use sustainable products and methods. The gap in equality needs to be diminished in order for progress to be achieved. (Gill)

ii. The Buick from the Jacobs reading represents the wage gap and difference in social classes. We need to ensure that there isn't a large gap between those who use and promote sustainable methods and those who do not. These methods should be affordable for people of all classes, and should not be associated with being high or low class. (Jacobs)

iii. Following each step in the right direction, there are always other ways to move forward. Commerce is an important part in the process. The markets need to be improved to benefit the consumer and encourage the purchase of eco-friendly products. (Hawken)

b. There are people who will deny that creating a more sustainable world is a priority and worth the work to better the future. Their values might be more economic, or their outlook might be to sustain the short term.
   i. Different outlooks usually stem from varying values among a group of people, for example, republicans have a set of inherent values that, in turn, lead them to a strong feeling against democrat's claim of climate change. "It is necessary to shift the debate from the subject under consideration, instead exposing to public scrutiny the tactics they employ and identifying them publicly for what they are". (Diethelm).
   ii. Even though a mass majority of climate scientists agree that carbon emissions are rising due to human activity, there are still people who reject the evidence. There are denialists about every controversial issue, such as evolution, climate change, and the need to be more sustainable (Anderegg)
   iii. The time lapse photos and videos over time show the evident melting of glaciers and poles due to the changes in the Earth's climate. Although a photographer, Balog displays his evidence for human caused climate change as a visual representation of science reports. After such convincing proof, there are still people who deny the phenomenon of global scale climate change- this shows that there will always be someone of differing views that must be worked with when creating change (Balog).
c. The change of beliefs and behaviors through generations will pose a barrier for sustainability because the older generations now will be less likely to spend money and use resources to better a world they won't live to see.
   i. The older generations value the traditional transition into adulthood of going to college, getting a job, and becoming self-sustaining by their mid-life as the only way to be successful. With the recent economic recession, college graduates are having a hard time finding jobs and end up back at home with their parents. These families are called accordion families, and they display the change of outlooks among generations (Newman).
   ii. Emergence is the idea that individuals in a system adhere to rules, creating an environment in which patterns and behavior materialize. Ant colonies are not given instructions for productivity but have developed a collective behavior that allows for maximum efficiency. Older colonies develop specific habits and are resistant to change their habits. (Johnson II).

C. Everything is connected and dependent, so change in one field affects the entire world as a system. Creating a more sustainable world would mean every aspect is subject to change and will inevitably be affected.
   a. a. Rapid population growth in certain places creates problems across the globe (Rosling)

i. This can be seen when Rosling describes the problems that arise when a developing country finally transitions and becomes developed (Rosling)

ii. Rosling is talking about the problems that come with the overconsumption of goods while a country socioeconomically develops (Rosling)

b. Food webs show the interdependence between species and the connections within ecosystems.
    i. A basic example of a food web is between the hawk, snake, mouse, and grass. While the grass is the foundation, the mouse is next, then the snake, and the hawk is at the top. The hawk relies on the mouse and is connected to it even though it is not directly eating it. Ultimately all organisms are connected through interdependence.
    ii. The once abundant plant species in Hawaii have become endangered due to the loss of the Honeycreeper, a bird species with a specific beak shape necessary to pollinate this plant (Diamond).
    iii. The introduction of the invasive brown tree snake In Guam led to decline of a bird species' feces in which the guano moth lays its larvae (Quammen).
    iv. The chain of events that results from one single plant species dying off results in a trophic cascade, illustrating the power of negative events in a system. (Pollan)

c. Economic elements are affected in the same way as the environment's ecological elements.
    i. The financial crisis of 2008 stemmed from homeowner's decision to keep increasing housing prices with the idea that house value would continue to increase (Malakoff).
    ii. The decision to inflate housing prices caused the values of securities tied to U.S. real estate pricing to plummet, damaging financial institutions globally; this highlights how each aspect of an economical system depends on and dictates on another (Malakoff).

d. Bananas are shown as a staple piece between the environment and economy, illuminating the impact that the environment has on markets internationally.
    i. One small banana business utilizes all aspects of the economic system. The banana is grown and sold through a small market in varying countries where it is then shipped to larger companies in the U.S. The bananas are then processed and taken to local markets and supermarkets where consumers all around the U.S. can purchase them. (Koeppal)
    ii. The widespread travel of the banana illustrates just how consumers are connected to the environment all around the world through international trade in an economic system. (Koeppal).