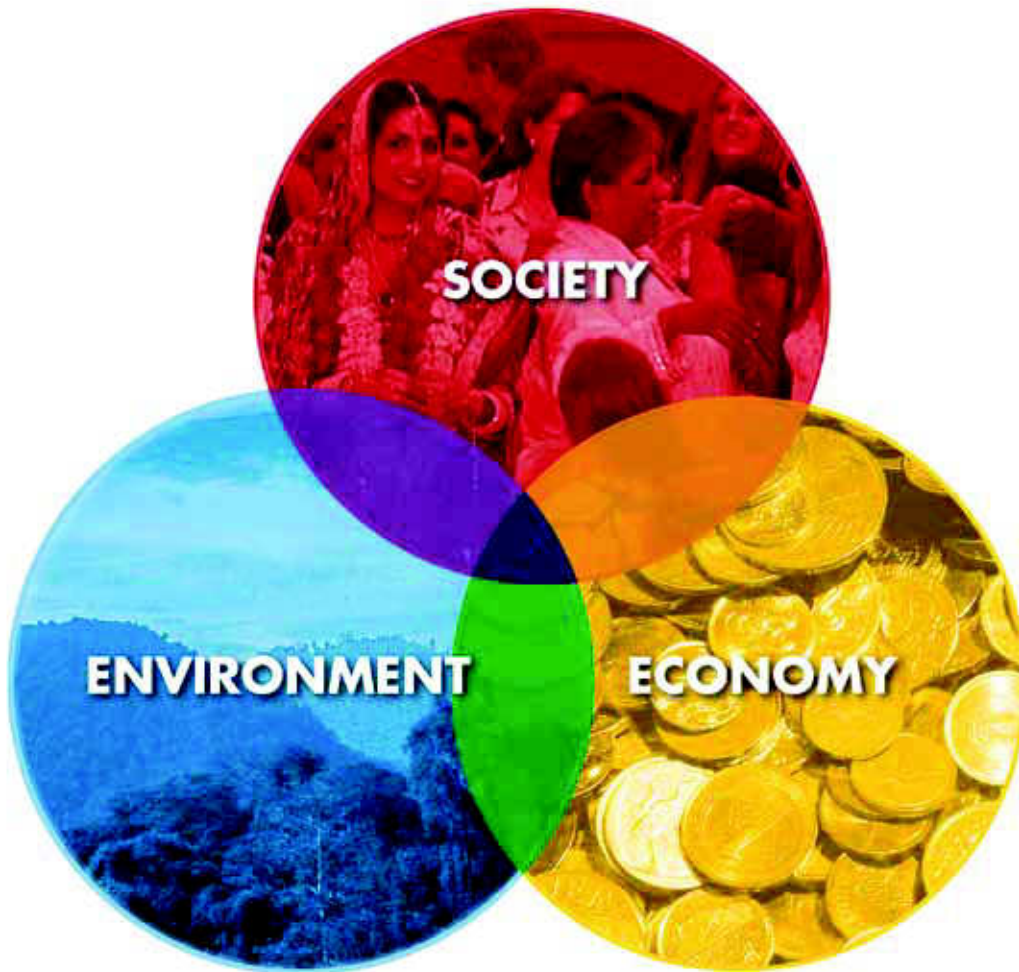


Components of Sustainability



Society

- How are people's lives affected?
- How are cultures affected?
- Do some people benefit at the expense of others?

Environment

- How are plants and animals affected?
- How are air, water, and soil affected?
- What is the long-term impact on the environment?

Economy

- How are local, national, and international economies affected?
- Are meaningful job opportunities provided?
- Is there a long-term economic gain for people and communities?

Extraction & Sustainability

Group A: Gold

I am a **gold miner** in Indonesia. I work at a large open-pit mine owned by a foreign company. Each day, I operate a machine that digs out thousands of pounds of ore (rocks and dirt that contain tiny amounts of gold). I have never actually seen the gold. The ore is transported somewhere else, where

people extract the gold. The area where we remove the ore has become a giant pit that cannot be used for anything else. I make more money than most of my neighbors. In fact, I'm paid over \$600 each month. I have a house and a television, thanks to this job.

I am the vice president of a **cell phone company**. Most people think that gold is only used for jewelry, but our engineers have found small quantities of gold to be extremely useful in cell phones. Gold is a good conductor, meaning that electricity can run through it. This is why gold is used in many electronics. We only use a tiny amount in each cell phone. Cell phones are very important because

people can use them anywhere in the world. People in rural areas can use cell phones to communicate in places that don't even have land-line telephones. If we didn't use gold, we'd find another metal conductor that also has to be mined. Each year more and more people are buying cell phones, and we have to keep up with the demand. That's why we continue to buy gold.

I am an employee of the **national government** in Indonesia. We have seen more and more gold companies come to our country to mine gold for products that will be made and sold in other countries. Since we have been blessed with this resource, why not sell it to make money for our country? It is true that the areas where we currently allow open

pit mining are becoming toxic. However, we will make sure that those areas are safely enclosed so that they don't hurt anyone. We want to make sure that foreign companies continue doing business in our country so that we can invest the money into improving the lives of our citizens.

I am an **environmental scientist**. I worry about how open pit mining is permanently altering the environment. The deep pits that are created are so large they can be seen from space. Also, this type of mining relies on a process called cyanide leaching. A chemical called cyanide is sprayed on dirt and rocks that are removed from the pit. The cyanide bonds

to tiny bits of gold and silver as it trickles down through the ore. Cyanide is very toxic – it is a killing agent used in gas chambers. If it leaks into soil or water, it can contaminate streams, killing fish and other wildlife. Some companies recycle and reuse the cyanide to reduce their environmental impacts.

I am a **resident** of a small community in Indonesia next to a large open-pit mine. At first I thought the mine would be great because it can provide many jobs. Unfortunately, the cost of living is now much higher. The miners make good money, so they are able to pay higher prices for food, electricity, and

land to build homes. Those without mining jobs can no longer afford all of these things. We have also watched the devastation of our environment. The mining company dumps waste rocks onto our beautiful rainforests. What will be left when the company is finished?

Extraction & Sustainability

Group B: Timber

I am a **forester** in Canada. I make my living by harvesting trees. These trees can be used for all sorts of things everyone needs, like furniture, construction materials, magazines, tissues, and toilet paper. Our company cuts down large areas of trees and then lets those areas grow back for twenty years or more. We

even speed the process up by planting tree seedlings in areas we've harvested. We prefer to plant fast-growing tree species, like pines. When these trees get large enough, we go back and cut them again. So long as people need wood and paper products, I'll have a job.

I am a salesperson at a large **paper company**. We sell paper to companies that print newspapers and magazines. Some of our customers now want paper that has been recycled instead of paper made only from new trees. We find that the best paper is still made mostly from new trees, but we also want to

make sure our customers are happy. If people are willing to pay more for recycled paper, we will start making more of it. Our company wants to make a profit, so we will do what we need to do to make our customers happy.

I am a **furniture maker**. Whereas some wood can be recycled, that's not always true for furniture. Some builders recycle wood to build new homes and businesses. However, I need large, beautiful trees to create luxurious dining tables and chairs. As long as people pay me well to create these items, I will continue to make them. I prefer working with hardwood trees, which are typically older and more

valuable than pine trees. I don't really care where the wood comes from so long as it holds up well. A good piece of furniture can be passed down from generation to generation until it becomes an antique. Cheap furniture, on the other hand, tends to break more easily. I don't want my customers to have to keep buying new tables and chairs because their old ones broke.

I am a **wildlife biologist**. I'm concerned about the effect that large-scale timber harvesting has on ecosystems. There are many species of animals that can't survive without a healthy forest. For example, in the southeastern United States the red-cockaded woodpecker can only be found in older forests. They

create nests in dead trees in mature pine forests. These birds are considered a keystone species because many other forest species (including insects, birds, lizards, and squirrels) use their nests. Scientists know that each species is important because it is connected to the lives of other species in a food web.

I am an **indigenous person** whose family has lived in the same forest for over 100 years. The forest provides us with food, shelter, and medicines. Trees are one of our most valuable natural resources, physically and culturally. Last year a portion of the forest in which my community lives was cut down

by a logging company. That forced several families to move from their homes. We must protect what remains of our forests so that they can continue to provide us with essential resources and help us maintain our culture.

Extraction & Sustainability

Group C: Coal

I am a site manager for a **coal mining company** in West Virginia. Most of the people I know also work for the mining company. Some of us used to work in mine shafts that went deep underground. The company I work for now prefers to get coal through mountaintop removal. It is a lot faster and doesn't require as many people. Plus, now I don't

have to worry about dying if a mine shaft collapses. In mountaintop removal, we use giant machines to basically blow the top off of a mountain to make it easier to get to the coal inside the mountain. I know my job is important because many power plants in the United States burn coal to create electricity.

I am a **coal miner**. I work in a shaft mine. It's what my father and grandfather did. I don't know how to do anything else. As soon as I graduated high school, I started working as a coal miner. Right now I work in a mine that is 700 feet deep. It is dangerous work, but the number of job-related deaths of

miners is a lot lower than it was in my father's time. Once I was in a mine that partially collapsed. Luckily, emergency crews were able to get me and my coworkers out before we ran out of air. I'm hoping I can stay healthy and safe so that I can continue to provide for my family.

I am a **citizen of a small mountain community** in the Appalachian Mountains of West Virginia. Our state has long been known for its beautiful mountains. Lately, however, these mountains have been scarred by mountaintop removal. Not only does mountaintop removal destroy the beauty of the mountains, but it's also ruined my well, which is my family's only source of drinking water. The dirt and rocks

that are exposed during mountaintop removal are usually dumped into nearby valleys. In my community, a company dumped the rubble in a valley where a stream runs through. Now the stream is discolored and cloudy. A lot of people I know have cancer and other diseases that no one used to have. We have complained, but the mining companies keep doing business as usual.

I am the Chief Executive Officer for a company that owns several **coal-fired power plants**. Coal is an ideal fuel source. For one thing, we have tons of it right here in the United States. That makes it much easier and safer to access than oil that has to be imported from the Middle East or South America. For another thing, coal contains more energy that can

be turned into electricity than competing fuels, like natural gas. Our country was built on coal. Some of these people who want to use renewable fuels like wind and solar energy just don't understand how much better coal is. So many power plants are already set up to burn coal that it doesn't make sense to change things while we still have plenty of coal.

I am a **mechanical engineer**. I believe that we can and should stop mining coal. We have other technologies available right now – such as wind turbines and solar cells – that could supply us with all the electricity we need. Burning coal for electricity

releases air pollution, including greenhouse gases that result in climate change. The earth is already getting warmer from our use of dirty fuels like coal. Let's invest in clean alternative fuels now!

Extraction & Sustainability

Group D: Coffee

I am a **coffee grower** in Ethiopia. Coffee is a wonderful crop to grow because everyone loves coffee! Unfortunately, I cannot get a fair price for my coffee. I sell the beans to a man who then sells them to a company that will roast them to make coffee for drinking. I make hardly any profit. I feel like I have to sell my beans so cheaply because

otherwise I won't sell them at all. My son and daughters have had to drop out of school because I can't pay their fees. The village school requires money to pay for books, uniforms, and teachers. Instead of attending school, my children now help me in the field. I enjoy their company, but I worry that they will grow up to be poor like me.

I am a **shade-grown coffee farmer** in Costa Rica. Coffee is a shrub that grows well in rainforests, where there are tall canopy trees that shade the coffee bushes. This is how coffee was meant to be grown. Unfortunately, some of the major companies selling coffee want coffee growers to grow a type of coffee that can survive in full sunlight. They can get

higher yields for growing coffee in the sun, but the higher yields come at the price of the rainforest ecosystem. To grow full-sun coffee, first all the trees and shrubs have to be cleared from an area. Once they are cleared, the rainforest ecosystem takes many, many years to regrow.

I am a **coffee supplier**. Some people call me the "middleman" in the coffee industry. I talk to coffee growers and buy their beans for as low a price as I can. Then I resell those beans to companies that roast them to make coffee for drinking. I make my living by being the person in the middle of the transaction between the people who produce coffee beans and the people who sell them to coffee

drinkers. Some coffee roasters are starting to engage in direct trade, whereby they send a representative to make deals with coffee growers directly. That means no money for me. I know that coffee growers should make more money because for a long time they haven't been paid fairly for what they grow. But how will I make a living if I'm squeezed out of the process?

I am the **owner of a coffee shop**. I have heard about "fair trade" and "direct trade" programs that provide coffee growers with more money. It makes sense – why should a coffee farmer make only pennies for a cup of coffee I sell for \$2? However, fair trade coffee is more expensive than the coffee I can get from my supplier. The same goes for organic coffee that has

been grown without pesticides or harmful chemicals. My customers complain any time I increase my prices. Since I have never heard a customer ask for organic or fair trade coffee, I'm guessing no one would even care if I did buy those types of coffee beans.

I am an **eco-tourism guide** in Costa Rica. I make my living by providing tours through the rainforest. People from all over the world come to Costa Rica to visit our rainforests. They are eager to see beautiful plants and animals that live in the forest. Sun-grown coffee threatens my business because it

requires cutting down forests to let in sunlight. Forests don't have to be cleared to grow shade-grown coffee, which is good for the animals that rely on the forest and also for people like me who make a living from the rainforest.

Extraction & Sustainability

Group E: Petroleum

I am a **marine biologist**. I study organisms that live in the oceans. Petroleum drilling like the kind that happens off the coast of Texas and Louisiana worries me. When hurricanes blow over oil rigs (structures that house the machinery that drills into the ocean floor to get petroleum), petroleum can spill into ocean waters. Oil spills can also happen when oil is being transported by boat from one place to

another. When oil enters a marine ecosystem, it can be disastrous. Aquatic birds, mammals, and fish can all become covered in the thick oil, leading to death in some cases. The use of petroleum also has been linked to climate change. Climate change causes oceans to become more acidic, which can kill sensitive species like coral.

I am an **oil company spokesperson**. I believe that petroleum is hands-down the most efficient fuel source for our nation's transportation needs. We already have the technology in place to use petroleum for creating diesel, gasoline, and jet fuel. By drilling off the coast of the United States, we reduce our

need for foreign oil. This is much safer for our country than relying on oil from countries that may have unstable governments. Oil drilling is a relatively safe industry; very few accidents have occurred in recent years. Plus, it provides many jobs in the U.S.

I am a **roughneck on an oil rig**. You have to be in good shape to work on an oil rig, that's for sure! I help set up and carry out the drilling. I'm responsible for maintaining the pipes that carry the oil; I constantly check to make sure there are no leaks. I also help with mechanical maintenance, like making sure the engine is working right. Our rig runs all the time, so I work long hours. I don't really mind, but

my family wishes I spent more time at home. Every once in a while I hear about an accident where a rig blew up or about a storm that sank a rig into the ocean. Those accidents can be fatal for the crew on the rig. I hope I can keep working on the oil rig, though, because it pays pretty well. All of the factory jobs in my hometown have been moved overseas, so this job is even more important now.

I am an **alternative fuels investor**. I fund research on alternative fuels so that we can do all the things we love to do without relying on petroleum. While most people think the only way we can move our cars is with gasoline made from petroleum, I have found that there are quite a few other options that could be profitable. Electric cars could be the wave of the future, especially in places where the electric-

ity is provided by renewable fuel sources like wind power. These cars simply need to have their batteries recharged after use, and they don't require any gasoline. Another possibility is hydrogen fuel cells. The fuel cells convert hydrogen and oxygen into water, producing electricity in the process. Most alternative fuels don't produce air pollution like gasoline does. This could help fight climate change and smog.

I am a **parent** with three children. We have a large vehicle so that everyone has plenty of room when we need to go somewhere. Unfortunately, it takes quite a lot of gasoline to power such a large vehicle. I hope that our country will continue to have enough oil for everyone's needs. I'm afraid that if our oil supply starts declining, gas prices will go up. If we have to pay any more for gas than we already

do, our family will have to cut back on other expenses. We don't have much money left after we pay our monthly bills, so I don't know how we could afford higher gas prices. I understand there might be environmental consequences from oil drilling, but my family and I try to minimize our environmental impacts in other ways.

Is It Sustainable?

Group members: _____

Natural resource discussed: _____



1. What are impacts of resource extraction on the environment?
2. Overall, is extraction of this resource environmentally sustainable?
 - a. Why, or why not?
 - b. How could it be made more sustainable?
3. How does resource extraction affect local and national economies?
4. Overall, is extraction of this resource economically sustainable?
 - a. Why, or why not?
 - b. How could it be made more sustainable?
5. How does extraction impact people and communities?
6. Overall, is extraction of this resource socially sustainable?
 - a. Why, or why not?
 - b. How could it be made more sustainable?
7. On a scale of 1-5, where 1 is not sustainable at all and 5 is completely sustainable, rate the overall sustainability of extracting this resource.

NOT SUSTAINABLE **COMPLETELY SUSTAINABLE**

←—————→

1 2 3 4 5
8. Should the natural resource you discussed continue to be extracted?
 - If yes, is there a particular method that is most sustainable? What is it?
 - If not, why should this resource no longer be extracted?