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Neal Shannon
Parkland College

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Eco Friendly: Ecology Meets Economy

Fujio Cho, president of Toyota motors, has been quoted saying “Environmentally friendly cars will soon cease to be an option, they will become a necessity”. The auto industry has traditionally sold fossil fuel consuming cars and made a lot of money doing so. Technology and fuel supply system changes are expensive. Why would an auto industry leader say it is necessary to use environmentally friendly cars? He says this because of the first law of ecology, “everything is connected to everything else”. Automobiles are a significant source of air pollution. Air pollution is not only directly bad for our respiratory health, but also contributes to larger environmental issues like climate change and ocean acidification. The more acidic the oceans are the more food insecure coastal areas are. Humans are a part of everything and our actions affect aspects of the environment, big and small. The environment in turn affects us. This simple idea highlights the need for environmentally sustainable business practices.

Sustainability is a word that gets used a lot, but it’s important to properly define how we are using it. In general, sustainability is the ability to continue an activity indefinitely. Environmental sustainability is defined as using environmental sciences to manage the rates of renewable resource harvest vs consumption; limit pollution creation vs natural sink potential; and slow non-renewable resource depletion; in a way that our behaviors can be continued indefinitely (Harich). An environmentally sustainable society would prioritize processing waste efficiently and promoting the regeneration of resources, just as a business would prioritize efficient use of equipment to lower costs and grow profits. Financial sustainability refers to an organization’s

ability to achieve its goals and thrive over the long term. Economic sustainability refers to market's and industry's ability to use available resources in a way that is responsible, efficient, and beneficial in the long term. A broad view of long term priorities will show that these forms of sustainability align. To achieve a truly sustainable economy, we must move businesses towards environmentally sustainable practices.

We have entered a new geological epoch that some call the Anthropocene. This means that human activity has changed the workings of the planet, having a dominant influence on climate and the environment. From the time of the first industrial revolution, humans have been releasing huge amount of pollution into the air, land, and water ways with serious effects. There were laws to limit air pollution as early as the 13th Century (“Air Pollution and Climate Change”). Manufacturing and advances in chemistry have allowed economies and governments to build into something bigger than ever before, heralding in an age of technological progress. Even though we have accumulated great knowledge and wealth, we are seeing negative effects in nature. Economics is the study of choice regarding resource allocation and distribution. Resources typically come from nature, so economics is inherently inclined to take the environment into consideration. Economies are cultural choices that reflect how a society functions.

The economy works upon the relationship between government, businesses, and individuals. I will refer to this three-legged relationship as society. Individuals are the primary consumers of resources and suppliers of labor in society. Individuals have the powerful job of motivating government and business through their choices of voting and buying goods. “Rethinking Consumption: Consumers and the Future of Sustainability” is a study from 2012 with the goal to investigate the consumer decisions that grow a sustainable economy. The study

finds that 66% of individuals say that as a society we need to consume less, and that 65% would buy a product because of its environmental and social benefits. It isn't just a marketing craze, the preference for sustainability is real and huge. Individuals are the primary consumers in the economy, and they collectively crave environmentally sustainable business practices and products. 75% of consumers globally believe that government and business should be extremely responsible for improving the environment.

At its core a government is meant to represent its people's interests and help businesses function. If government has created environmental regulations on business, it typically has a reason that is beneficial to the economy. Natural capital degradation and public health decline have big economic costs in the long run. Environmental science is a broader subject than some know. Governments can do things like use census population statistics to build age structure diagrams that predict future economic needs and trends, that play into environmental sustainability. China is one government that closely monitors this kind of information to make decisions. Not always a friend of environmental conservation, China is one of the most polluted countries in the world. They have become an economic powerhouse through using cheap coal energy and manufacturing. The result is low air quality causing an estimated 4000 deaths a day. Now they are putting big incentives on cleaning up. China is rapidly becoming a world leader in clean energy, with one new wind turbine erected every hour and all projected new energy needs being met with renewable resources ("Will China Take the Green Mantle From the U.S.?"). They have set financial incentives on businesses to innovate new clean technologies, and have become the world's largest solar panel manufactures. I use china as an example because they represent both an extreme in environmentally harmful practices and now in environmental conservation efforts. The harsh consequences of their past practices are forcing them to move

towards new sustainable practices. Their people have a need for clean air and water, the government is responding, and the businesses are getting on board.

Businesses are the agents that supply goods and services. They are the main driving force in the economy. Businesses are job creators and cultural leaders to individuals. Like government, they can hold significant influence on society. The goal of business is profit, but is that all? “Corporate Social Responsibility”, a *CQ Researcher* article states that most companies in the U.S. report the desire to provide social benefits as well as make profit. 81% of companies expect businesses to use good corporate citizenship, and 44% incorporate it into their business strategy. The article finds that more socially and environmentally responsible firms return more profit in the long run. Businesses work towards financial sustainability, even if they require an initial investment. We must look to the future of society and invest in more sustainable practices when constructing and replacing public and business infrastructure.

U.S. infrastructure is aging rapidly and many older urban areas need repair (“Infrastructure”). When we repair, we should do it with the long term in mind. We must overhaul infrastructure to promote more environmentally friendly transportation, cleaner energy production, more efficient water resources and waste systems, and emphasize reusability and recyclability. If we can create more of a closed system that allows for resources to be used in a circle we can reduce negative environmental effects. Even if the economy isn’t as strong temporarily, investing in sustainability will provide much more return over time. Some economists suggest that the “Genuine Progress Indicator” should replace Gross Domestic Product. They argue that GDP measures the gains from economic activity that cause pollution, and activity meant to clean the pollution, as the same kind of money spent. This doesn’t accurately reflect economic progress over time. If we have high pollution, and hire more people

to clean the pollution the GDP looks higher and thus better, without taking the environmental and social costs into account. Also, the pollution cleaning services isn't adding any benefit to society past fixing the mess we made, and so the cost of the service isn't justified. GPI shows that regarding the environment, "Taking the proper measures to stay healthy and prevent disease is cheaper and easier than curing a disease (Peterson)".

Society affects the environment in numerous ways. In the last century, we have seen a steep decline in natural wonders like forests, coral reefs, plains, and bio diversity across the world. In the United States, we have merely 4% of our original forests left, according to "Save America's Forest Fund". 70% of fisheries are fished at or above capacity in the U.S. ("Story of Stuff"). 40% of U.S. waterways are undrinkable. Majestic colorful coral reefs are bleaching and dying. Bio diversity, or the abundance of plant and animal life, is being lost globally. All individuals and businesses alike have ecological footprints. An ecological footprint is an impact to the environment expressed as the amount of land required to sustain the use of resources. The U.S. with 5% of the world's population, uses 30% of the resources and produces 30% of the world's waste. The U.S. has a foot print of 5 planets, which is not sustainable ("Story of Stuff"). The material economy process goes from extraction to production to distribution to consumption to disposal. You cannot run a linear system on a finite planet indefinitely ("Story of Stuff"). We must close the loop. Another problem with the rampant manufacturing and disposal of products is the synthetic chemicals used in plastics, paints, fire deterrent coatings, and several materials used for consumer goods. Once in the waste stream, these materials sit and the toxicity seeps into the land and water. Our manufacturing process takes raw material from the ground, turns it into something that can't degrade in nature naturally, and puts it back in the ground. This is terrible for plants and animal life, and therefore ecosystems.

One of the biggest obstacles we face is climate change. Releasing certain green house gases like CO₂ creates an imbalance in the temperature control system of our planet, affecting climate change. An individual's carbon footprint is around 50 tons a year ("Reducing Carbon Emissions"). According to Nasa ("How Do We Know"), the atmospheric carbon dioxide hasn't been above 300 ppm for hundreds of thousands of years. In 1950 we were at 320 ppm, and we are currently at 400 ppm. This is cause of alarm. There is a warming trend which is melting ice caps and raising sea levels. Just 20,000 years ago its believed two continents were mostly covered in glaciers ("Air Pollution and Climate Change"). TEEB, an organization that works to demonstrate the value in natural capital, categorizes the 6 major externalities of business as; water use, greenhouse gas emissions, waste, air pollution, land and water pollution, and land use.

The externalities are unpriced costs to society and natural capital, caused by business operations. The fourth law of ecology is "there's no such thing as a free lunch". For example, if we take trees for lumber at an arbitrary price, perhaps the vegetation dies out and there are no more roots to prevent flooding and erosion of nearby areas. If the vegetation dies then animal life may decline. If local peoples hunted animals or used wood for fires or building than the local society is affected by these business externalities. Maybe the price of the trees is not covering the amount of time it will take for a new forest to grow back, and reset the ecosystem.

Some people argue that the environment is too big for human activity to have any effect, but science overwhelmingly disagrees. 97 percent of climate scientists agree there is a trend in raised temperatures caused by man. Air pollution kills 3.3 million people a year worldwide ("Air Pollution and Climate Change"). While we have influenced the climate for the worse, I am optimistic that we can make the right changes. A study of Himalayan ice cores shows the pollution levels present in the air at different times throughout the decades. Because the

Himalayans is free from any local pollution, and the air is always being trapped into newly formed layers of ice, this is a good area to study global pollution levels. The western core sample extraction sites are hit with western prevailing winds from Europe, while the eastern side samples are influenced by prevailing winds from Asia. On the western side, you can see the pollution output decreasing at certain intervals matching the timeline of European efforts to reduce the pollution. On the eastern side, you can see changing pollution compounds due to the change in types of chemicals used for production. This shows that local policies can very much affect global pollution levels, and we can see the changes quite quickly ("Himalayan Ice Shows Chemicals Ban is Working").

Society and economy are affected by the state of the environment. Companies like Coca-Cola considers certain environmental issues "a strategic threat to business". Wal-Mart follows advice from environmental organizations to reduce its waste of materials and energy to cut the bills ("Corporate Social Responsibility"). Business resources come from the environment, so a richer environment should mean a richer economy. Natural capital has direct economic value, and we must think of in the same way as an asset. Therefore, we must work on maximizing returns, diversifying interests, managing risks, and investing in natural capital ("Nature's Fortune"). Investing in the environment can be profitable in many ways, and reducing unpriced externalities would limit long term social and economic costs. TEEB reports that every year the externalities of business cost as much value of natural capital to the world as the last recession in financial terms. Measuring the costs of environment degradation on the economy will help us manage conservation issues in a way that works for the benefit of business and society. Nature has many unseen benefits to society and therefore the economy. More plant life means higher overall carbon sink and cleaner air. A research study synthesis by Research Gate shows that

there is a reduction of cardiovascular disease mortality in areas with higher residential green spaces. Plant life is also aesthetically pleasing and good for human psychology. With a decline in biodiversity in the ocean, coastal areas are losing many sources of food. Damaging a part of an ecosystem can disrupt everything within, and other ecosystems as well. A change in the hydrosphere, atmosphere, or geosphere, will all influence the biosphere in which we reside.

I believe we have a moral obligation to protect the other life on this planet from ourselves, but more so we also have a responsibility to our own well-being to be aware of our actions. Pollinators such as bees are in decline, which can drastically affect food production that relies on pollination to seed. The cost of the predicted effects of climate change will have a huge effect on the economy. Half of the U.S. population lives in coastal communities (“Live Science”). Raising sea levels will have huge economic costs to infrastructure development and displace millions of people. Changing weather patterns are possibly causing weather to be more severe. Hurricane Sandy cost the government, tax payers, more than 60 billion dollars in relief funding (“Coastal Development”). Also, warming trends are causing more droughts, wind, and negatively affecting certain crop yields such as coffee, reducing production. Coffee crops are a big part of the global economy, with exporting alone being a 20-billion-dollar industry. Not only does the coffee industry employ a large number of people, it is sold and consumed in most developed/developing nations. A decline in coffee crop yield is just one environmental problem that poses social costs. The synthetic chemicals used in manufacturing modern products are unhealthy for the workers who are making the products, and for the people purchasing them (“Story of Stuff”). When entered into the waste stream, these chemicals are just as bad for us as the animals! Poor public health has large economic implications. Gyorgy Lukacs, an economist and historian, said that “a human being belongs to both nature and society”.

A sustainable economy relies upon a sustainable ecological outlook in business. An indefinite and prosperous society would be required to solve the problems of population, food and water, material conservation, and energy. These problems are complex, and there will be a hurdle to create a truly sustainable economy, but it is possible. Humanity cannot willingly accept environmental realities, while also ignoring the relationship between the environment and society. Business practices and economic culture must move towards becoming more environmentally sustainable. I have shown that economic activity affects the environment, and that the environment affects the economy. The economy is a collection of people making choices. People want health, wealth, and a high standard of living. The goals of economic sustainability and environmental sustainability align in the long term, and they can even complement each other. Businesses can see economic benefits to sustainable operational practices as simple as using more efficient lightbulbs, and reducing waste creation. Even little changes in energy use, production methods, or supply chains, can make a difference in environmental health. And in the U.S. workforce, it is easier to retain young, talented workers if the business is environmentally sustainable (“House”). Simply, conservation is cheaper. Years ago, the Environmental Defense Fund demonstrated that California’s projected electricity needs could be met cheaper through conservation than building 10 new power plants. Conservation efforts were made, effectively lowering utility costs for consumers and increasing company profit (“Market Incentives Can Solve Environmental Problems”).

Ecologically sustainable practices build a stable economy. The coal industry, while an energy marvel that has helped usher in this modern age, is not a sustainable business practice. In a sustainable model, coal was always just the stepping stone to re-invest into renewable energy methods. Coal is beginning to face this reality. 2015 was the first year in which natural gas

became the top U.S. fuel source. Hundreds of coal plants have been closing since 2010, with a plan to phase out coal entirely by 2030 (“Coal Industry’s Future”). The fall of the coal industry isn’t an economic threat, but a natural course of economic flow. James Van Nostrand, director of the Center of Energy and Sustainable Development at West Virginia University, says that “the coal industry is being pounded by market forces, not regulation” (“Why Coal Jobs Aren’t Coming Back”). On top of natural market forces, the coal industry has invested in following regulations, and at this point deregulating would actually cost them more money. The Asian Development Bank, ADB, is investing \$30.1 billion to fund research into new ways to conduct business that is less harmful, and working with six Asian countries to draft laws to enact these methods (“Phyo”). Implementing an environmentally sustainable economy should be a natural course. There is a fourth industrial revolution of technological interconnectivity coming known as Industry 4.0. More efficient production and supply chain management due to an increase in automation and “smart” technology, will allow businesses to cut costs. The increase in flexible and effective management of operations will help small and medium sized businesses succeed. Creating smarter supply chains is also a big step towards sustainability. Sustainability keeps small businesses profitable. Increased transparency and control in IT will be a big factor in maintaining sustainable practices (“Industry 4.0 and Sustainability Impacts”).

Some people that favor coal and other harmful industries, claim that environmental protection regulations hurt business and the economy. If you regulate through limits and punishments, without providing incentive to go beyond, creativity is squandered (“Market Incentives Can Solve Environmental Problems”). An example of this is the Cap N’ Trade emission market trading system, which is now used in America, Europe, and parts of Asia. In this system companies must pay for permits to release harmful emissions, and one can’t release

more emissions than their permit allows. Permits are retired every year and the national emission cap is lowering. If you have cleaner tech, you can produce more before hitting your permitted emissions cap. Also, if you produce at a low emission level, you can sell your remaining left over emission permits to a less efficient company to make even more money! This regulation places financial incentive on companies to go beyond the standard regulations and become leaders in innovation. There is empirical evidence that show emissions were being lowered, acid rain was dissipating, and people were innovating new cleaner technology (“Market Incentives Can Solve Environmental Problems”).

The implications of sustainable business practices are a nicer world and a longer future for humanity. The UN has 17 “Sustainable Development Goals”; including zero hunger, clean water, affordable and clean energy, decent economic growth, sustainable cities, responsible consumption, and climate action. These global sustainability goals should be pursued, for the health of the global economy. Even though it will take some period of time to achieve this, we will eventually see positive effects. Not only should corporate responsibility for social and environmental wellness be a moral obligation for all businesses to adhere to, but it should be an economic priority to achieve a truly sustainable society. Survival and advancement is human nature, and to do these things we must adopt a new path that fits human nature into the rest of nature. Only with enough minds on board can society implement the change we need.

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