Co-Evolution: Re-engineering Human Networks. Rebuilding Natural Systems

Throughout fall 2020, ISD hosted several webinars with key thought leaders, one of which was Michael Gallis. He is the author of *Co-Evolution*, a report that outlines the interaction between the human and natural environments, the problems with how we have interacted thus far, and guidelines for improving this relationship. Through his report, he advocates for a new co-evolution where we focus on evolving both systems together and create large scale, integrated change. We cannot consider individual environmental impacts, but rather focus on the system-to-system interaction between the human and natural worlds. One of the ways Michael Gallis mentioned to initiate some of these changes is through the idea of creating value-based solutions that incentivize investment and participation.

Co-evolution is the idea that there are two separate worlds on the planet, and we are tasked with figuring out how to reverse the current relationship between them such that 10,000-year-old human networks continue to grow and evolve in a way that is compatible with the 4.5 billion year old natural environment. Human economies and populations will continue to grow and demand more energy and resources, while the natural world begins to be used up and move in the opposite direction.

The natural world is composed of self-sufficient, interconnected systems that are governed by sciences that is collectively built for sustaining all life. The human world is composed of settlements, infrastructure, waste, and resources together in a continuous and global relationship focused on sustaining human life. Each system has what Gallis refers to as a "state", the current status of a system. This is the first level of fostering co-evolution, where the focus on flows and interconnectedness needs to be a main focus where policy decisions are made on a large scale and backed by science. The relationship and interactions between the human and natural environments are occurring on a large scale due to the global nature of economies such that the natural system is being overwhelmed, something that current policies, strategies, and practices have been reinforcing at the expense of the planet.

Humans have impacted the environment through fragmentation, depletion, pollution, erosion, and extinction. Fragmentation is from breaking up natural ecosystems, depletion is the use of natural resources by humans (both renewable and non-renewable), pollution includes non-natural waste products into the system, erosion is the displacement of natural resources, and extinction is the disappearance of species. Human economies and populations will continue to grow and demand more energy and resources, while the natural world begins to be used up and move in the opposite direction. Humans and nature must compete for resources and human growth is not set to slow down any time soon.

Human growth has come from developing world advancement along with developed world growth. It is now predicted that world output could grow by at least 360 percent by 2050 and the World Bank shows increased gross world product, while the World Wildlife Fund shows a decreasingly livable planet on this current trajectory according to the report. Human impacts on the environment are no longer local, they are global and systemic and greatly differ in self-sustainability, regeneration and recycling and efficiency in terms of waste compared to the natural system. Human cities have been built to "overcome" nature and have been built with economic goals that fulfill our needs, but we have not focused adequately on our interconnectedness and allowed nature's science to sustain the planet. Calls for visual tools can help better demonstrate the systems and flows that exist. One excellent example used in the report is the comparison of the images of Earth in the day and night, shown at the end of the article.

Although visual tools can help highlight the systems that exist better, there are still significant empirical markers that demonstrate the growing human footprint over time. Petroleum consumption has increased, food production and consumption have increased, and urban areas have expanded. In 1800, only London had over one million residents and now nearly 400 cities and metropolitan areas have populations at least that size. Soil fertility is decreasing globally, global water use has increased six times since 1900, and nearly 80% of the world's forests have been cleared or degraded. As of 1995 only 17 percent of the globe was not directly influenced by humans.

Human and natural systems operate across the lines and divisions we have drawn out ourselves. Current efforts analyze and address issues in part, but few entail the entirely broken system that exists. Current technological advancements like clean energy and electric cars are not enough to address the strain between the human and natural environment. The negative effects on the natural world are starting to have reciprocal effects on human economies. The negative impact of humans on nature works both ways. The number and cost of natural disasters has increased by more and more throughout the 20th and 21st centuries, meaning they are increasingly increasing.

The negative effects on the natural environment are calling what Gallis refers to as "de-evolution" of the natural system. This has negative reciprocal effects on human economic systems and one example he dives into in the report is the salmon fishing industry deterioration in California and Oregon, where the industry damaged the environment, and the environmental response crippled the industry further after restrictions were put in place to try and counteract the massive disruptions the industry caused. Gallis calls for a reversal through coevolution wherein humans must focus on evolving together with the natural system.

Our plan to combat the negative current relationship between human and natural systems needs to be science-based that sees the human and natural systems as connected, increases our efficiency, and lowers our impact on the environment. Using visual language can help depict some of the systems we have overlooked, although population and economies will

continue to grow, and we must figure out how to integrate this human growth with natural growth.

The report suggests not using one size fits all solutions for various ecological areas and reengineering focused mission statements and perspectives on the external as well as internal outcomes of businesses. Policy implications call for new policies based on science and the interaction of the systems, new management structures, new financial structures with significant incentives to participate, and new program structures. Many current issues cannot be solved one at a time, but must be considered as the entire system to system interactions that need adjustments.

One way to create this is through economic value-creating solutions in which changes are incentivized to evolve to save the environment, rather than thinking of the environment as a separate area of research and policy.

The Natural System (Earth at Day) vs. Human System (Earth at Night)

https://techcrunch.com/2017/01/31/google-will-soon-open-source-google-earth-enterprise/

https://wallpaperaccess.com/earth-at-night