Let's Talk Sustainability

By Elaine Tantalo

The word “Sustainability” has become popular over the past few decades. Sustainability is frequently specified as a goal by organizations involved in economic development and environmental initiatives, including the United Nations. Students have opportunities to pursue degrees related to sustainability, as universities and colleges all over the world offer programs dedicated to this concept. As often as the word is used, this article asks how well we understand what is meant by sustainability, and why is the concept important?

This article focuses on how sustainability is defined and introduces a definition from the United Nation's 1987 Brundtland Report, which is widely accepted throughout the world. Examples of current unsustainable human actions are discussed later, to reinforce why there is the ever-progressing need to use Earth sustainably.

First used in Britain in 1972 to describe concepts related to the future of civilization, the term “sustainability” came to be used more widely. Two years later in the United States, the term sustainability was used in an economic context to refer to a policy of a stable national economy rather than a policy based on continued economic growth (Kidd, 1992).

To sustain something means to make it last unchanged, giving the notion of having a sense of constancy and durability. In the present day, the word sustainability is most often understood to be in reference to the environment. The original definition still holds, only now being expanded to include natural resources and wellbeing of the planet. In this context, “sustainability” simply means making the Earth and its resources last. This expands to focusing on and being aware of the long term, and how current actions will affect the future of the world.

In 1987, the United Nation's World Commission on Environment and Development (WCED) published Our Common Future (also referred to as the Brundtland Report) that includes one of the most notable definitions of sustainability (Jarvie). The authors refer to "sustainable development" as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Jarvie para. 3). This enhanced meaning of sustainability includes an awareness of long-term economic goals while working to achieve a comfortable standard of living for all.

Is it valid to wonder about sustainability in a non-environmental sense? Is this word as applicable across other disciplines, such as in an economic or social context?

The answer is yes... but it's complicated. We can use a nested dependency model to understand interconnections and dependencies between economy, society, and environment, and how these relate to sustainability. The notion of complex interdependencies is incorporated into the WCED's work, as the Brundtland committee explored "the causes of environmental degradation, attempted to understand the interconnections between social equity, economic growth, and environmental problems, and developed policy solutions that integrated all three areas" (Jarvis, para. 1). More about the nested dependency model can be found at https://www.process.st/economic-sustainability/.

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In 2002, former United Nations Secretary-General Kofi Annan wrote that "Unsustainable practices are woven deeply into the fabric of modern life" (line 16), giving several examples such as human activities causing expanding deserts, chemical pollution of soil and water, and species being threatened with extinction (Annan, 2002). These examples include modern agriculture uses of water and fertilizer.

Water is a significant agricultural input to crop production. Agriculture "accounts for, on average, 70 percent of all water withdrawals globally" (The World Bank, 2020, para.1). Much of the irrigation water used in crop production comes from aquifers (stores of underground water). The largest aquifer in North America is the Ogallala Aquifer, which covers 174,000 square miles under the states of South Dakota down to Texas. This one aquifer provides water for 13.6 million acres of crops. The unsustainable use of the Ogallala Aquifer at rates surpassing recharge rates has resulted in a prominent depletion of the Ogallala, specifically a 100-foot decrease in the water level when compared to its level in the 1940s (Water Encyclopedia).

Crop production supported by unsustainable use of water resources exists world-wide. For example, kilogram of avocados grown in Chile requires about 2,000 liters of water; one kilogram of rice grown in India requires 1,670 liters of water (Gerretsen, 2019). Unsustainable agricultural practices result in aquifers around the world being use at rates that exceed their recharge.

Another aspect of modern agriculture is the use of synthetic nitrogen and phosphorus fertilizers to increase plant growth, but also leaving excess nutrients in soils that find their way into surface waters – causing algae blooms that reduce dissolved oxygen needed by aquatic organisms (Gilani). Excess nitrogen and phosphorus negatively impact organic matter and bacteria that facilitate necessary processes in plants (Gilani). Accumulations of excess fertilizers in soils cause long-term damage to soil health, eventually impacting future fertility for crop production..

These examples indicate how easily producers' decisions and actions may be more heavily focuses on short-term, rather than long-term benefits. Resource depletion and contamination are evidence of unsustainable practices. Policies that aim to align realign and reduce resource depletion rates and reduce contamination by incorporating the full future costs of unsustainable practices into input and commodity prices are one approach to bring about more sustainable agricultural practices. Stay tuned to future articles in this series for examples of agricultural policies to bring about more sustainable practices and reduce costs to future generations.

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