

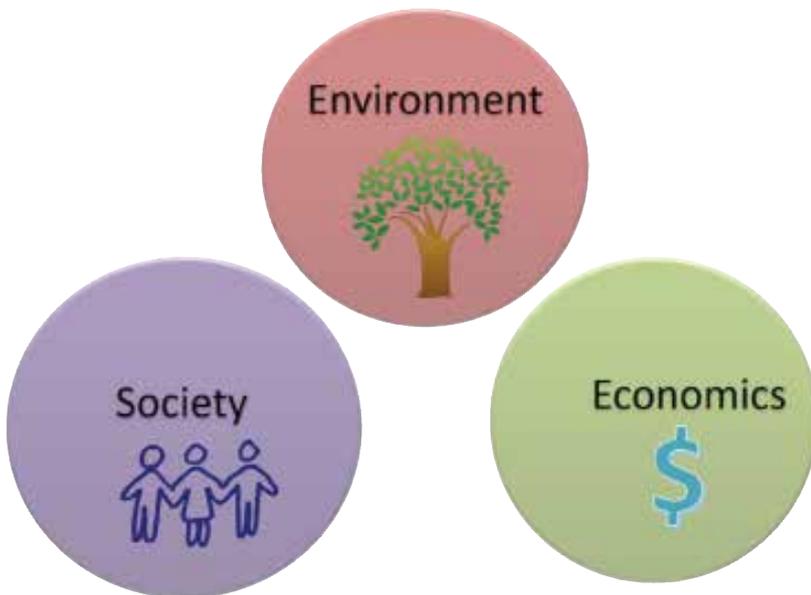
CLIMATE CHANGE

By Jennifer Pronto

# Sustainability

What is sustainability? Sustainable development is defined by the *Our Common Future* report (1987) to be development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Three main areas comprise sustainability: environmental sustainability, economic sustainability and societal sustainability.

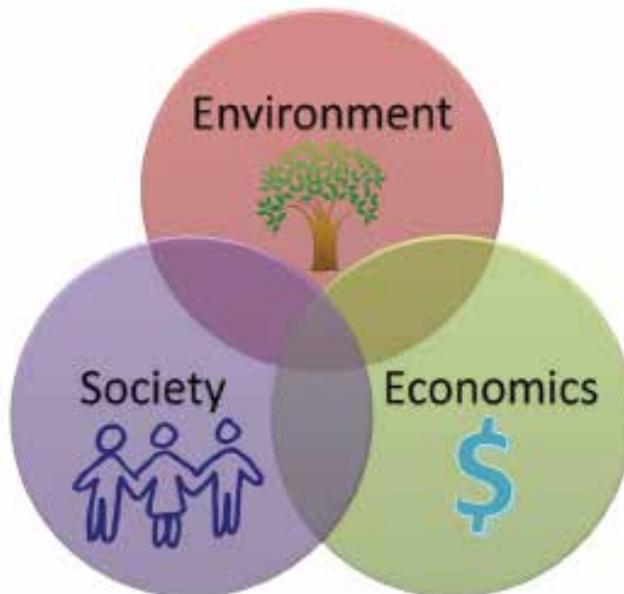
Environmental sustainability can pertain to our immediate environment, on a small scale or a micro-regional level, or it can apply to a broader environment, such as an entire forest or whole country.



Economic sustainability can be thought of on a short time scale, a few days or years, or over a longer term such as several years or decades or more. Society can be represented by the impacts to a single person, a community, or a whole nation. The scale of each area is not the focus, however, accounting for each piece of the puzzle is what is important.

While we can easily think of issues that fall within each one of these three main themes, practicing the application of sustainability involves placing issues in the overlapping areas, between themes. When we place issues in the space between themes, it helps us to make decisions that support sustainable choices and to choose strategies that are sustainable in all aspects.

In the center of this Venn diagram, (see next page) there is a



“sweet spot” where all three pillars of sustainability overlap. When any issue is considered in the light of sustainability, it should be considered in this space, because only then each of the three main themes, environmental, economic and societal, are considered together and are balanced.

If only one or two of the themes are considered, the issue is lopsided, and may work in the short-term, but over the long-term, the unbalanced approach will become evident, and will have negative effects.

This is especially important to think about in terms of growth, so that all three themes are balanced to yield sustainable growth.

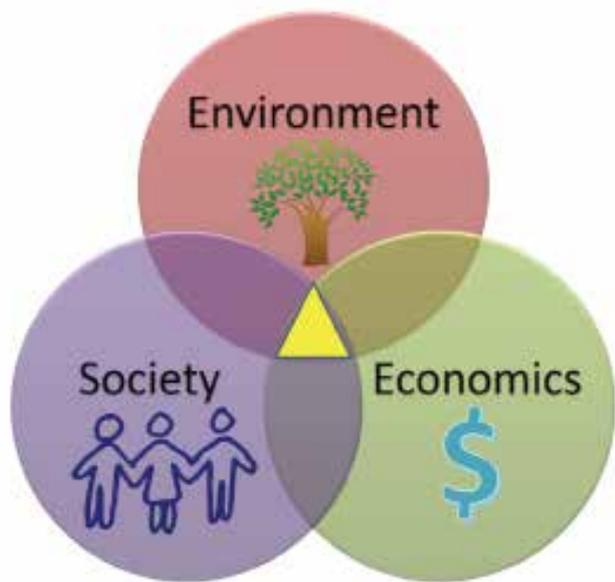
The nine issues shown in the circle on the next page are of current importance to the dairy industry in New York, when considering the future success and growth of the industry. These are time-appropriate, and also subjectively chosen, so these issues could change depending on different time periods and perspectives.

**1.** Manure management has obvious environmental implications, related to air and water quality. But many manure management decisions are driven by cost and have a strong economic tie-in, especially when considering more advanced systems, such as anaerobic digestion that offer different revenue opportunities as well.

Society also drives manure management issues, with people residing more commonly in farming areas. Society is increasingly concerned with water quality implications (both surface and ground water) in relation to manure management strategies.

Covered manure storages may offer a solution with compromises for all parties involved. This approach is significantly lower cost than more advanced methane-capture technologies, but achieves the same goal of capturing harmful emissions (such as methane), as well as reducing odors. This can be part of an environmentally sustainable manure management system that satisfies concerns of the public, and offers an affordable approach for producers.

**Sustainability includes environmental, economic and societal factors.**



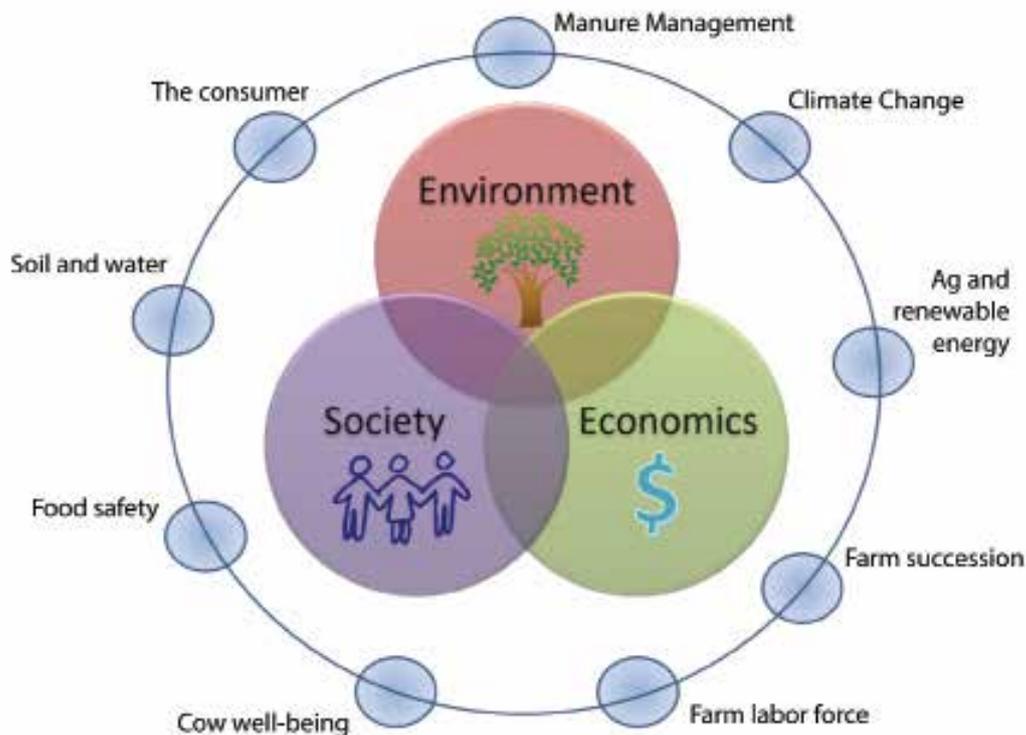
**2.** Climate change is a current social issue with many adverse environmental consequences predicted. Agriculture has an impact on climate change, as many activities on-farm involve the release of three different greenhouse gases – carbon dioxide, methane or nitrous oxide. Improvements to production efficiency in the last 50 years have significantly decreased the quantity of these emissions, but opportunity exists to reduce them further. Society has expectations of agriculture to reduce its impact, but the question remains – Who should pay for these costly improvements? Farms that voluntarily take on emission reduction measures could be at a competitive economic disadvantage locally, nationally and globally.

This is an important issue to act on because of the many potentially negative implications for agriculture and society as a whole.

**3.** Renewable energy generated from agricultural sources is an area of opportunity that can have significant positive economic, environmental and social implications. Opportunities exist in the areas of farm-based wind and solar generation, as well as renewable energy generated from combined-heat and power (CHP) generation from anaerobic digester derived-methane gas. The farm can realize energy savings as well as revenue from the generation of renewable energy on-farm, and it aids society and the environment in reducing emissions by offsetting fossil fuel-based electricity use. A big question here is when will society be ready to pay reasonable cost for renewable energy in order to, in part, make these systems economically affordable for dairy farms to invest in?

**4.** Farm succession and farm transfer may seem like a minor issue, but when considering the long-term sustainability of a dairy farm business, if there is no entity to carry the business forward, it risks closure. The current median age of farmers in the United States is over 50 years old – initiating the question, will the next generation remain on the farm or is there a succession plan? Many issues are at play here, involving the attractiveness of a farming lifestyle, opportunities for obtaining a higher education and returning to the farm. These questions need to be considered to ensure there is a capable, passionate management to carry on the farm business. It's very important when exploring the sustainability of a farm business to look at the long-term plan to continue the business, which is very dependent upon the ownership/management structure.

**5.** Farm labor includes a more complex look at all employees on the farm. Who is working on your farm? Are they effective workers? How can you keep them effective or even improve their efficiency? The better your workers are, the more opportunity



you have to improve the quantity and/or quality of your product(s). Farm workers could be considered the backbone of the industry, which means we should address issues that would make them more effective and efficient. Health, happiness, safety and education are a few areas that we can address to accomplish this.

**6.** Just as happy, healthy employees are crucial to a successful, sustainable industry, healthy cows are obviously essential as well – making cow well-being an important issue. Cow well-being occurs on two fronts – with the animal itself and with its immediate environment. Cow well-being issues that have been in the media recently include tail docking and dehorning. The design and upkeep of the barn environment has a direct impact on the health of the animal. Design features to consider include: stall design, flooring, feed system, ventilation, cooling and water supply.

**7.** Food safety is of paramount importance to continue and to increase demand for your products. If your products are not safe or healthy to consume, they will most likely not be purchased. And, if you cannot sell your products, the economic outlook for the business is dismal at best. Experts in the field offered a selection of issues that are of current importance in the field of food safety:

- a. FDA-issued preventative controls and updated good manufacturing practice rules that are to be mandated for all dairy plant operations.
- b. Listeria outbreaks associated with dairy, including ice cream and soft cheeses.
- c. Raw milk cheese regulations and changes to the current policy on aging.
- d. Fluid raw milk consumption and associated outbreaks/illness.

**8.** Soil and water quality is a very broad category that contains many important sub-issues. The basic idea is that maintaining water quality is important not only for environmental reasons, but for socially-related needs as well. New York State Department of Environmental Conservation (DEC) states “New York State has more than 7,600 freshwater lakes, ponds, and reservoirs, as well as portions of two of the five Great Lakes and over 70,000 miles of streams and rivers. These waterbodies are drinking water supplies, provide flood control to protect life and property, and support recreation, tourism, agriculture, fishing, power generation, and manufacturing and provide habitat for aquatic plant and animal life.” A brief mention of some of the most important water quality issues today, include: winter manure spreading, tile drainage systems, manure management and irrigation water management.

Healthy soils are the basis of agricultural stewardship, and are essential for productive farms, according to the Massachusetts Department of Agricultural Resources. Conservation tillage, cover crops, buffer strips, contour farming, strip cropping, diversion ditches and grass waterways are only a few strategies that exist to improve soil health and to avoid or reduce erosion.

**9.** The consumer could be considered the main driver for all the issues included in this dairy sustainability exploration. If the consumer decides to change their attention and focus on other issues, they may alter their purchasing patterns based on different criteria. The Innovation Center for US Dairy participates in many consumer-research initiatives, and are responsible for a significant amount of dairy advertisement campaigns that exist. A few current trends are sourcing food locally – for which dairy is well-suited, being that it is a major industry in New York State, and consuming “real,” “fresh” and “natural” products for health reasons. Dairy is also well-suited to succeed based on this consumer trend, as dairy is a fresh and healthy product that is in line with many current health and weight management trends.

Consumer trends are heavily tied to demographics, and each different generation exhibits different purchasing patterns. Currently millennials make up a significant portion of market share, so much attention is focused on their patterns and habits, as they will be economic drivers for decades to come. Millennials as a group are tech-driven and health conscious.

Consumer education and outreach are important to maintain educated approaches to issues surrounding dairy sustainability. Misinformation and lack of access to credible, research-based information leads to poor decision making and poor product choice. Since consumers cannot be expected to engage in researching every product choice, advertising, packaging and media are necessary tools to distribute credible information to inform and educate consumers. When this is done well, the industry grows in a responsible and sustainable way, focused on developing solutions to issues that will improve the people, the products and the planet. □



*Jenny Pronto joined the Cornell PRO-DAIRY Program's Environmental Systems Group as a Research Associate immediately after graduating from Cornell in 2007. Jenny proved to be a quick learn and had immediate contributions to the program and impact to the dairy industry with her work in monitoring and reporting on seven anaerobic digesters. This work, along with subsequent related efforts by her, still today stands as the best source of digester performance data available in the US. When dairy farm carbon emissions became a hot topic in late 2000's, Jenny developed cutting edge information for farmers to use in making decisions about monitoring carbon credits. More recently, Jenny impacted the industry with her work in dairy and climate change/adaptation, including being a key team member of a national project that developed eight online training courses for producers to learn about climate change/adaptation. It is most fitting that this issue of The Manager highlights her recent work. Jenny and her family have a great opportunity to relocate to Chile. Although we are sad to see her leave and she will be greatly missed, we are most happy for her and her family as they move on to new and exciting opportunities. Thanks Jenny! Curt Gooch.*