

ISK CLIMATE CHANGE & HEALTH SERIES

Biodiversity Issue

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What is biodiversity?

Biodiversity is just what it sounds like—the biological variety of all living things. This includes things like genetic qualities of plants and animals, and can refer broadly to the entire world or more specifically to a particular habitat or area. More biodiversity tends to mean better health for both people and planet.

Here's an illustration of this: let's say we plant an ISK community garden and decide we want to grow tomatoes, corn, beans, and squash. We could plant each vegetable separately in its own slice of the garden, or we could intermingle them for increased biodiversity—for example, using the ingenious Indigenous American combination of corn, beans, and squash, otherwise known as the Three Sisters. The corn provides a stalk for the beans to grow upward, the squash's fanning leaves trail through the corn and keep the soil moist, cool, and weed-free, and microbe interactions between the roots of these three plants help keep the soil healthy and nutrient-dense. The gardeners among us know this as *companion planting*, and will also probably know that it isn't a silver bullet, as the wrong companions can wreak havoc on each other. However, the right mix can also help reduce insect pests, which are usually more likely to target areas with single crops growing (Wetzel et al., 2016). This can also reduce the spread of diseases, like, for example, powdery mildew in squash plants, which can spread like wildfire through a dense patch of plants once the first leaf gets it. We can increase our biodiversity even more by planting different varieties of each of our vegetables. After all, a harvest of purple, red, yellow, and cherry tomatoes will yield us a wider range of nutrients than a row of beefsteak only.



Illustration of the Three Sisters planting [tasteantigua.com]

Biodiversity under climate change

Climate is an important cog in any ecosystem machine, so climate change can contribute to biodiversity loss. Take a look at the infographic on page two to read some of the ways biodiversity is impacted by climate change.



What's this got to do with human health?

Everything! Humans rely on biodiverse ecosystems to provide the things we need to live: food, clean water, energy, materials, livelihoods, and medicines. Furthermore, research shows that species biodiversity in our surroundings has a positive impact on our mental health and access to green space has a positive impact on mental and physical health (Methorst et al., 2021). Our anecdotes, folk stories, and blockbuster movies touting the crucial interconnectedness of everything are slowly being tested by science—and the science agrees. Biodiversity holds it all together and our minds and bodies react to its abundance or shortage.

Unfortunately, under climate change, we experience more and more shortage, and the consequences can be seen

everywhere from our grocery shelves to our backyards. We already have a man-made shortage of biodiversity in our food systems; of some 30,000 edible plants on earth, 6,000 to 7,000 have been cultivated by humans, and today we produce only 170 of these on a significant scale. Of these 170, we mostly eat just 30, and just three—corn, wheat, and rice—account for about 40% of our daily calories on average (World Economic Forum, 2018). This already leaves us vulnerable to pests and diseases, as there is little biodiversity in agriculture to protect plants. These threats increase under climate change, as conditions arising from warmer temperatures and changes in precipitation patterns help pests and diseases to thrive.

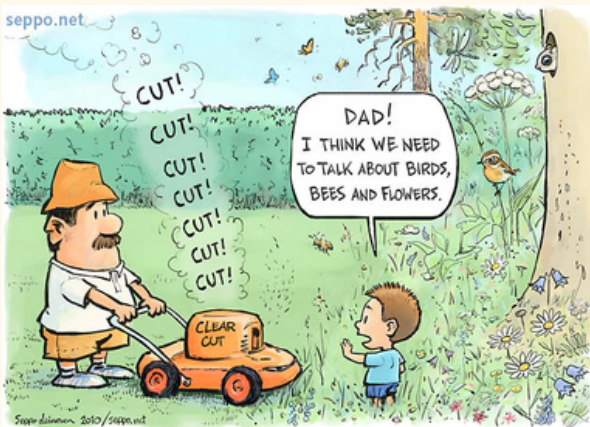
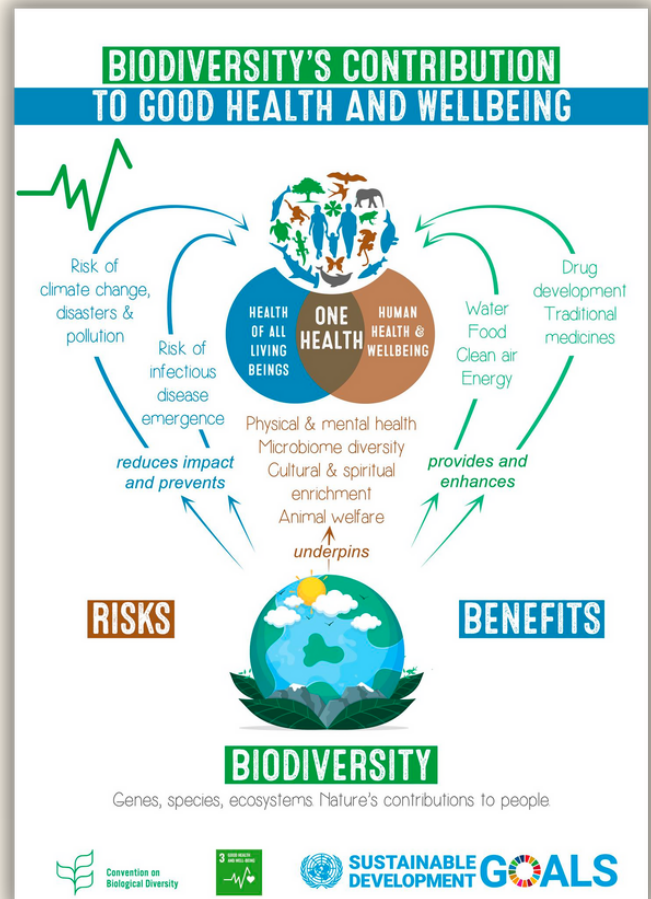
As biodiversity decreases, humans have less buffer against infectious disease and have less biodiversity in our surroundings. Biodiversity loss can also contribute to eco-anxiety, as the imminent collapse of ecosystems, loss of meaningful natural encounters, and implications of biodiversity loss on the future of humanity can rightfully cause anxiety, particularly in individuals who regularly engage with news, research, or activism around this topic.

Actions to take

When it comes to addressing biodiversity issues with ourselves and ISK clients, the most important thing is to **engage**. We won't solve the biodiversity crisis on our own, but advocating for biodiversity in our communities or taking steps to diversify our backyard ecosystems (out with the lawn, in with the native plants!) does make a difference, and can help ease eco-anxiety too.

We're probably all familiar with prescribing nature for mental wellness, and this is another thing we can do for ourselves and our clients—encourage engagement with biodiverse areas. In Kalamazoo, this might mean a walk in the celery flats or Al Sabo, a gardening project, or a trip to one of our lakes. It could also be as simple as finding a sturdy patch of trees in your neighborhood and sitting with them for a while. Getting outside in the winter can be equally

stimulating and can reveal natural phenomena we might be less familiar with, so don't shy away from the cold. The more people go out and engage regularly with our diverse natural areas, the more likely we are as a community to protect these areas, and thus protect our biodiversity, and thus protect our health!



[Cartoon source: seppo.net]

For those who have the means to do so, buying and consuming more diverse foods, particularly grains and vegetables, on a regular basis can help drive biodiversity in our food system, while providing us with a wider nutritional range. Talking with clients about food procurement and cooking skills can help encourage more diverse eating. Next month's issue on food security will delve into this further!



Here are some recommended resources for learning about and addressing biodiversity, including resources used in this newsletter:

- [WHO Biodiversity and Health fact sheet](#)
- [Paper: Species richness is positively related to mental health— a study for Germany](#)
- [5 Ways Increased Biodiversity can Improve Mental Health](#)
- [World Economic Forum article on underutilized crops](#)
- [Biodiversity and Health page from Convention on Biological Diversity](#)

This month, talk to your colleagues about biodiversity:

- Do they make any small, personal contributions to preserving biodiversity?
- Do they ever “prescribe” engagement with nature to their clients?
- Does biodiversity loss or related topics ever come up as a source of anxiety with clients?
- Do they know of any local groups that advocate for biodiversity in Kalamazoo?