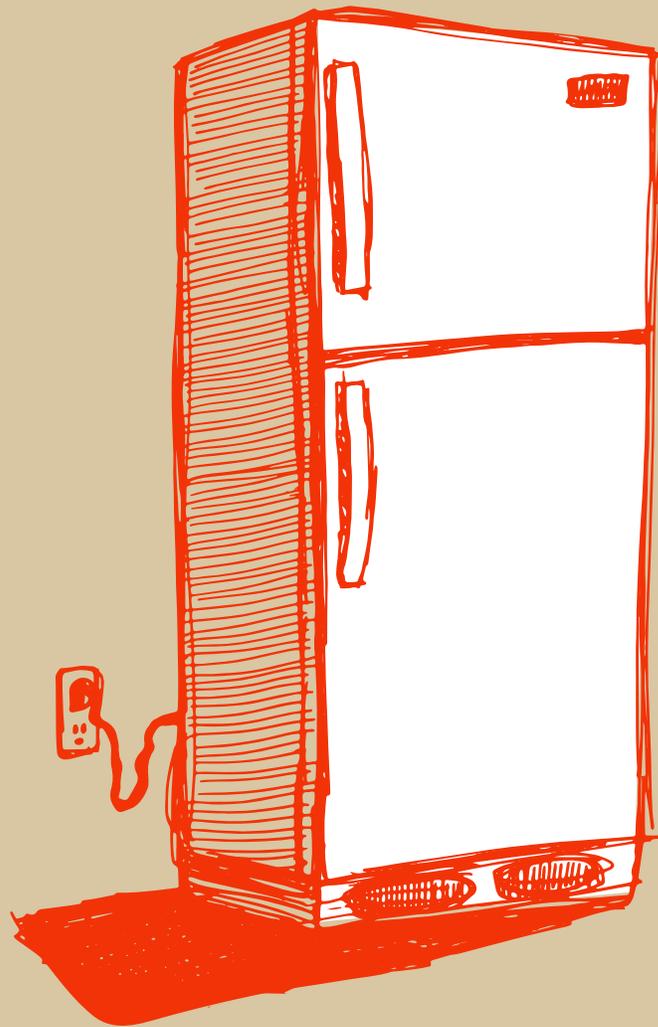


# n° 27 Canary



feed the world

nora belmont • chad frischmann • mamta mehra • gabrielle folau

**Canary Magazine**

Social Issues Through The Eyes of Artists

**Publisher**

The Untitled Group

**Editor In Chief**

Gabrielle Folau

**Editorial Assistant**

Oliver Kearon

**Issue Visual Creator**

Nora Belmont

**Distribution**

Placeholder Media Inc.

**Editorial Contributors**

Chad Frischmann, Mamta Mehra, Rachelle Macy, Claudia Alvarez, George Arnold, Benjamin Lomu, Angela Calahan, Mariel Alberty, Aaron Day, Gabrielle Folau, Nora Belmont

**Editorial Services**

801.764.5876 / editorial@canarymag.com

//

Canary Magazine is published quarterly. It is mailed directly to readers worldwide by Placeholder Media Inc.

75 Meridian, Suite 21 / Salt Lake City, UT 84044  
Subscription price: \$30 per year  
Inquiries: canarymag.com or 801.764.5876  
© Placeholder Media Inc. All rights reserved.

Canary Magazine is a registered trademark of Placeholder Media Inc.

No articles, illustrations, photographs, and any other editorial matter herein may be reproduced without written permission of copyright owner. Printed in U.S.A.

//

**Cover Art**

Nora Belmont / norabel.com

**10 Feed The World /  
Chad Frischmann &  
Mamta Mehra**

**21 The Greenland Issue /  
Rachelle Macy**

**29 The Pelagic Zone /  
Claudia Alvarez**

- 2 Editor's Note
- 4 This May Be a Tough Pill to Swallow / George Arnold
- 6 "He Looks to The Heavens" 2024 Nature Photo Awards / Jacquie Matechuk
- 15 Weathering The Texas Freeze / Benjamin Lomu
- 19 Reciprocity – Flora & Fauna / Angela Calahan
- 27 Spirit of the Soil / Mariel Alberty
- 33 You Have A Say In Your Future / Aaron Day
- 35 Our Good News / Gabrielle Folau

# Feed The World

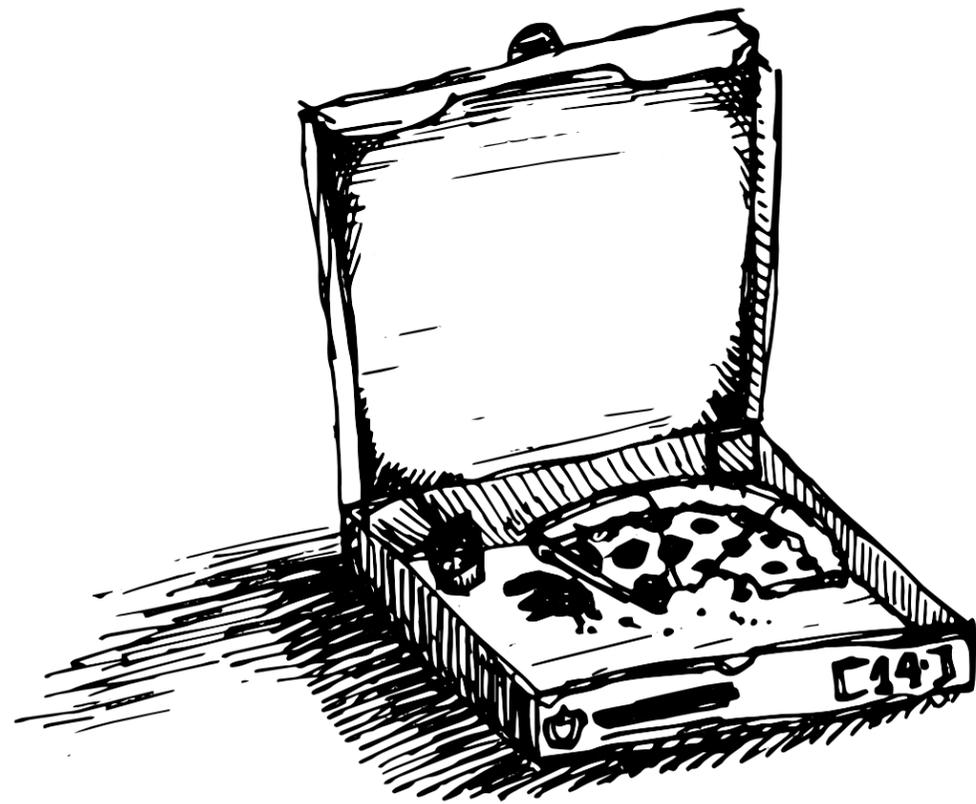
“

Imagine going to the market, leaving with three full bags of groceries and coming home. Before you step through your door, you stop and throw one of the bags into a trash bin, which later is hauled away to a landfill. Collectively, that is exactly what we are doing today.

*/ Chad Frischmann & Mamta Mehra  
Project Drawdown*

# 30% — 40%

## of food intended for human consumption is not eaten.



<sup>1</sup> Buzby, Jean C., Hodan F. Wells, and Jeffrey Hyman. *The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States, EIB-121, U.S. Department of Agriculture, Economic Research Service, February 2014.*

Globally, 30 to 40 percent of food intended for human consumption is not eaten.<sup>1</sup> Given that more than 800 million people go hungry every single day, the scale of food loss fills many of us with a deep sense of anguish.

If population growth and economic development continue at their current pace, the world will have to produce 53 million more metric tons of food annually by 2050. That increase would require converting another 442 million hectares of forests and grassland—far greater than the size of India—into farmland over the next 30 years. The escalation would also release the equivalent of an additional 80 billion tons of carbon dioxide over the next 30 years—about 15 times the emissions of the entire U.S. economy in 2019. Food waste already accounts for roughly 8 percent of the world’s greenhouse gases.

There is another path, however. Our group at Project Drawdown, an international

research and communications organization, completed an exhaustive study of existing technologies and practices that can significantly reduce greenhouse gas levels in the atmosphere while ushering in a more regenerative society and economy. Reducing food waste is one of the top-five means of achieving these goals among 76 we analyzed. Basic adjustments in how food is produced and consumed could help feed the entire world a healthy, nutrient-rich diet through 2050 and beyond without clearing, planting or grazing more land than is used today. Providing more food by eliminating waste, along with better ways of producing that food, would avoid deforestation and also save an enormous amount of energy, water, fertilizer, labor and other resources.

Opportunities to reduce waste exist at every step along the supply chain from farm to table. We harvest crops, raise livestock, and process these commodities into products such as rice, vegetable oil,

<sup>2</sup> Poore & Nemecek (2018) - *Reducing food's environmental impacts through producers and consumers*. The mean (average) GHG emissions data is the data used. It is then converted to the portion size of each item.

<sup>3</sup> Case studies. *Zero Foodprint*. (n.d.). <https://www.zerofoodprint.org/case-studies>

<sup>4</sup> Prevent perfectly good food from going to waste. *412 Food Rescue*. <https://412foodrescue.org/>

potato chips, perfectly cut carrots, cheese and New York strip steaks. Most of these products are packaged in cardboard boxes, plastic bags and bottles, tin cans and glass jars made from extracted materials in industrial factories, and then they are shipped on gas-guzzling trucks, trains and planes all over the world.

After arriving at stores and restaurants, food is held in energy-hungry refrigerators and freezers that use hydrofluorocarbons—powerful greenhouse gases—until purchased by consumers, whose eyes are often bigger than their appetites, particularly in richer communities. In high-income countries, restaurants and households turn on their energy-consuming stoves and ovens, and in developing nations, billions of people burn biomass in noxious cookstoves that spew polluting, unhealthy smoke and black carbon.

After all these waste-producing activities, too much of the food that makes it to a consumer's table is thrown in the garbage, which then is typically transported by fossil-fueled trucks to landfills where it decomposes and emits methane, another potent greenhouse gas. Tossing that leftover lasagna accounts for far more emissions than a rotting tomato that never leaves the farm gate. We can do better.

#### SMALLER FOOTPRINT

At Project Drawdown, we poured global data from the Food and Agriculture Organization and many other sources into a detailed model of the entire food production and consumption system. The model took into account rising population projections, as well as greater consumption and more meat eating per person, particularly in developing countries, based on actual trends over the past several decades. According to our calculations, healthier diets and more regenerative agricultural production lead to a lower "foodprint"—less waste, fewer emissions and a cleaner environment.

If half of the world's population consumes a healthy 2,300 kilocalories a day, built around a plant-rich diet, and puts into practice already proven actions that cut

waste across the supply chain, food losses could decline from the current 40 percent to 20 percent, an incredible savings. If we were even more ambitious in following the same practices, food waste could be cut to 10 percent [see graphics below].

These hefty savings would result partly from shifts in basic habits. In the developed world, embracing an average daily 2,300-kilocalorie diet instead of consumption that often reaches more than 3,000 kilocalories lessens food waste in the first place. In the developing world, caloric and protein intake generally need to rise to reach nutritious levels, which may increase some waste across the system. But overall, if everyone on the planet adopted healthy consumption practices and a plant-rich (not necessarily vegetarian) diet, 166 million metric tons of food waste could be avoided over the next 30 years. Feedback would be sent across the supply chain to increase crop production and decrease animal production.

Reducing waste by adjusting how food is produced and consumed can greatly help the environment as well. Different types of foods such as grains, vegetables, fish, meat and dairy have very different environmental footprints. On average, growing and harvesting one kilogram of tomatoes creates about 0.35 kilogram of carbon dioxide emissions.<sup>2</sup> Producing the same amount of beef creates an average of 36 kilograms of emissions. With the entire supply chain taken into account, greenhouse gas emissions from plant-based commodities are 10 to 50 times lower than from most animal-based products.

Additionally, industrial agriculture has spread monocropping, excessive tillage, and widespread use of synthetic fertilizers and pesticides. These practices degrade soil and emit a vast amount of greenhouse gases. Staples are still destroyed in the field by pests and disease and can rot in storage. Livestock consumption of grasses and feed adds further emissions.

Agroecological pest-management practices, such as planting different crops together, and smarter crop rotation can suppress pests and weeds, reducing these losses.

Improved livestock-management practices, such as silvopasture, which integrates trees into foraging land, can improve the quality and quantity of animal-based products: more food from fewer hooves in the field and thus fewer resources used and fewer losses. And because regenerative farming practices—which can increase yield from 5 to 35 percent, restore soils and pull more carbon from the air—use compost and manure instead of artificial fertilizers, any food that fails to leave the farm gate can be recycled as natural fertilizer or can be converted by anaerobic digesters into biogas for energy on the farm. More farms need to convert to such practices. Restaurants across the U.S. are helping them through one interesting organization called Zero Foodprint,<sup>3</sup> started by chef Anthony Myint, which takes a few cents added to patrons' bills to fund regenerative farms in the making.

#### SAVING THE THIRD BAG

In low-income countries, most food is lost before ever getting to market. Improving education and professional training for farmers and producers there, along with innovative technologies, can minimize waste. India's state of Jharkhand, for example, has installed solar-powered refrigeration units that allow farmers who produce vegetables, fruits and other perishables to store their products without sacrificing quality—a project led by the United Nations Development Program and the Global Environment Facility. In Africa, the Consortium of International Agricultural Research Centers has expanded training that will help local farmers grow more food under conditions being created by climate change, using crops that better tolerate drought and no-till farming to protect withering soil.

In high- and medium-income countries, most waste occurs at the end of the supply chain—markets and households. There consumers have a tremendous amount of power to prevent waste. A good first step is to reflect on what and how much we are buying. This begins with conscious decisions to purchase what we intend to eat and to eat what we purchase. Rather than overstocking on perishables and other

products, buying appropriate quantities of food reduces waste. If too much is cooked for the dinner table, properly storing leftovers reduces spoilage, or they can be shared with neighbors, building stronger community ties.

Broader cultural shifts are also required. The "inglorious fruits and vegetables" campaign launched by the French supermarket chain Intermarché in 2014 aimed to avoid waste by changing cultural attitudes toward "imperfect" foods. Markets tend to procure only fruits and vegetables that meet an idealized cultural perception of shape and color. Imperfect produce that does not match these false traits accounts for up to 40 percent of edible fruits and vegetables being discarded before they leave the farm gate. Instead Intermarché sells these fruits and vegetables in special aisles and runs a national marketing campaign glorifying the inglorious. Other retailers are going even further: All the shelves at Danish supermarket WeFood are stocked with products that would have gone to a landfill. Pittsburgh-based 412 Food Rescue<sup>4</sup> distributes nutritious food that was destined for landfills because of imperfections, limited freshness (such as day-old bread) and unclear labeling to communities in need—for free.

Wholesalers, retailers and restaurants can play a significant role in shrinking the waste piles. They can demand that suppliers use more food from local regenerative farms. Ensuring that food items are sold with clear, standardized "sell by/use by" labels helps store managers know when to mark down items, and it helps consumers know when and when not to dispose of food. Restaurant owners can offer different portion sizes and fewer menu items and can encourage patrons to take leftovers home.

Governments and companies that offer food services to employees can jump in, too. U.S. federal government cafeterias serve more than two million people; imagine if the kitchen managers chose to offer plant-rich fare made from perfectly imperfect produce procured from regenerative suppliers. Google is already doing more of that in its cafeterias today.

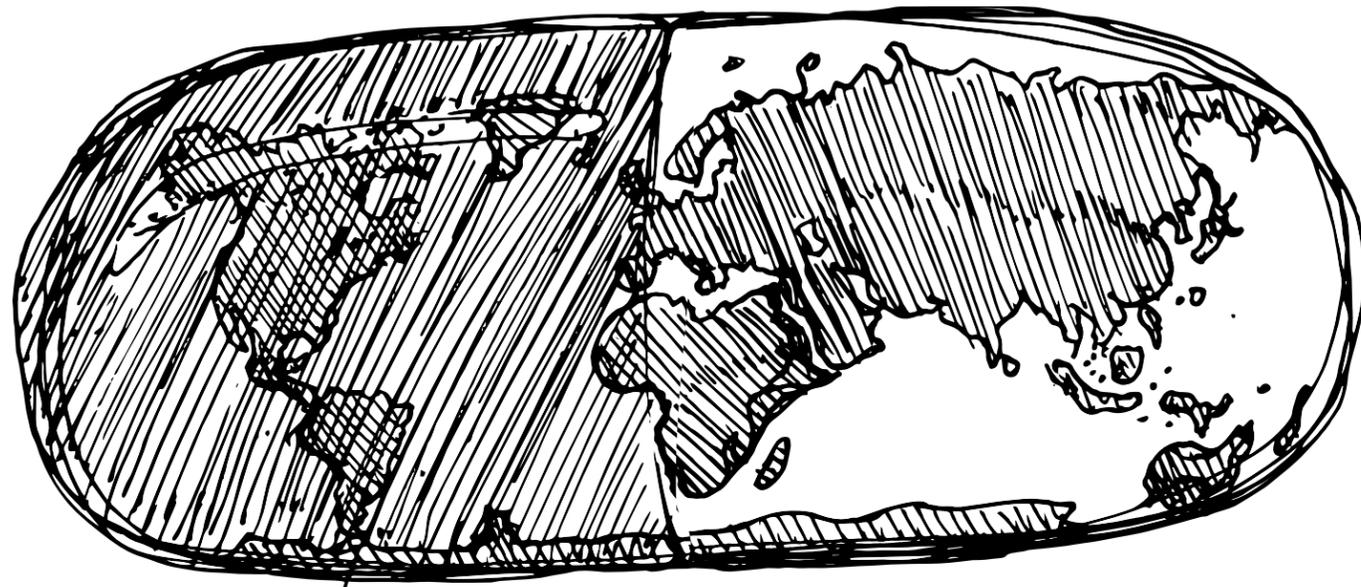
No matter how conscientious we all are, some food will inevitably be lost across the supply chain. Anaerobic digesters and composting are better ways of disposal than dumping food in landfills because they create soil or generate electricity. Nine states across the U.S. now have laws requiring that organic waste be diverted from landfills to avoid potent methane emissions. The latest Project Drawdown analysis shows that implementing these solutions globally can reduce greenhouse gas emissions by around 14 billion metric tons over the next 30 years.

The real magic happens when a variety of solutions are adopted in parallel and sustained over time. The decisions people make as farmers, executives, grocers, chefs and consumers can prevent enough food loss to feed the world through 2050 without converting any more land. That means together we can eliminate hunger and support a healthier global population. And there would still be enough cropland available to grow plants for organic materials such as bioplastics, insulation and biofuels.

Revamping the food chain and adjusting eating habits will not happen overnight. Nor should we expect to immediately become perfect, regeneratively minded, plant-rich connoisseurs who are fastidious about our purchases and what we waste. Our most fundamental task is to be conscientious about the choices we make—to try to be "solutionists" as much as we can. Together we can save that third bag of groceries. //

# this may be a tough pill to swallow.

/ George Arnold



Climate experts give the U.S. mixed grades on its efforts to mitigate climate change — but they all agree there’s room for improvement.

<sup>1</sup> *Slanger, D. (2023, October 4). It’s the IRA’s first birthday, here are five areas where progress is piling up. RMI. <https://rmi.org/its-the-iras-first-birthday-here-are-five-areas-where-progress-is-piling-up/>*

<sup>2</sup> *U.S. senator Christopher Coons of Delaware. Home. (2023, December 7). <https://www.coons.senate.gov/news/press-releases/senators-coons-tillis-introduce-legislation-to-increase-use-of-low-emissions-concrete-and-asphalt>*

‘Tis the season to be merry ... and get graded. As students across the country anxiously await their report cards, we thought it would be a good time to ask climate experts to grade the United States’ efforts to address responses to the issue over the last year.

They were more than happy to play along. “As a professor of sustainability, grading is very much in our working dialog,” one respondent told us. Another chimed in: “I’m finishing up my fall semester class right now, so grades are on my mind.”

The stakes, however, are much greater for the planet than for their students. This almost certainly will go down as the hottest year in recorded history, and the time for meaningful action is drawing short. Although the U.S. showed great effort as the Inflation Reduction Act started to roll out, it fell short of its potential with incomplete work on issues such as permitting reform, not to mention the approval of a massive drilling project in Alaska.

While experts varied in the grade they assigned, everyone agreed the country has a lot of homework to do if it hopes to pass the planet’s hardest test.

Let’s start with the highest grade, from Ari Matusaik, who leads the electrification nonprofit Rewriting America. In awarding an A-, he hailed the billions of dollars the Department of Energy and other agencies have started allocating under the 2022 Inflation Reduction Act, or IRA. The landmark law<sup>1</sup> ushered in a record level of investment in clean energy projects, from solar to battery manufacturing. But even as that

money begins flowing, he noted, “we’re already headed in the right direction.”

“Sales of heat pumps are outpacing oil and gas furnaces for the second year in a row, and we’re going to end 2023 with electric vehicles representing nearly 9 percent of total light-duty car sales,” he told Grist. And that, he said, is “far past what experts say is the tipping point to wide-scale adoption.”

Bob Inglis is an avowed conservative, a former congressman who represented South Carolina, and a devoted proponent of climate action. He awarded the country a “high B+,” in large part because he sees momentum to address climate change building on the political right.

“Young conservatives want action,” he said, adding that Republican legislators have been introducing bills to advance sustainability. He cited bipartisan efforts around low-emissions cement<sup>2</sup> and holding countries with dirty production accountable as examples.

That focus on foreign pollution is of particular interest to Inglis, who would like to see the United States move toward what he called “a carbon border adjustment mechanism” that taxes emissions-intensive imports. The European Union is in the process of implementing such a system, and will initially target sectors such as cement, iron and steel, aluminum, and fertilizers.

“It uses the prize of access to the American market to basically muscle the rest of the world into accountability for negative externalities,” said Inglis, who also founded

# spirit of the soil

/ Mariel Alberty

*Our lives and our health are intrinsically linked with that of the earth.*

<sup>1</sup> Heggie, J. (2022, April 21). *Why soil matters (and what we can do to save it)*. *Environment*. <https://www.nationalgeographic.com/environment/article/paid-content-why-soil-matters-and-what-we-can-do-to-save-it>

A worm burrows its way through the dark earth, ingesting particles of soil and expelling nutrient-rich casts in a constant forage for food. Charles Darwin described earthworms as one of the most important creatures on Earth. Worms are critical to soil health, and without soil Planet Earth would be little more than a lifeless rock. So why is it that most of us take the earth beneath our feet for granted?

We might imagine soil as endless and indestructible: it is neither. Only about 7.5 percent of the earth's surface provides the soil we rely on for agriculture, and it is remarkably fragile. Topsoil is used to grow 95 percent of our food, and it is disappearing ten times faster than it is being replaced: America's corn belt has already lost much of its topsoil, threatening livelihoods and communities as well as food supply. The reality is that it takes thousands of years to create an inch of fertile topsoil, but it can be destroyed in minutes.

Healthy soil is a dynamic living ecosystem: a complex combination of minerals and organic matter containing air, water, and life. Worms are not alone in the ground, just a gram of dirt can contain as many as 50,000 species, all interacting with each other to keep their soil habitat healthy and productive. The activity of these organisms,

the type of rock particles, the volume of organic matter, and the proportion of air and water all combine to create hundreds of different types of soil. These range from loose sandy soils to waterlogged peats to the beautifully balanced loam that is so well suited to agriculture. But human activity is destroying the balance and one-third of the world's soil is already degraded.

Soil degradation, where soil loses the physical, chemical, or biological qualities that support life, is a natural process but it is being accelerated by human activity. Pollution kills microbial life in the soil; deforestation and development disturb soil structure making it vulnerable to erosion; soil compaction associated with farming and urbanization squeezes the air out of the ground and prevents it from absorbing water. Meanwhile, climate change continues to dry the ground: three-quarters of Spain is at risk of becoming desert.

But perhaps the biggest threat to soil is intensive farming. The need to feed a growing population and drive greater efficiency has sacrificed natural balance for increased yields. Monoculture farming, where one crop is grown repeatedly on the same ground, drains the soil of specific nutrients and allows pests, pathogens, and diseases to thrive.<sup>1</sup> The pesticides and fertilizers