

Appendix 1:

Contained within are two accounts from scientists, the first from 2018, which details the problem of food waste as they saw it before the drought, and the potential solutions that they were thinking about. The second scientist is actually writing from the perspective of living through the drought, and seeing the solutions implemented as time went on.

Scientist 1:

The patterns of production and consumption in our food system contribute to the significant, large scale food waste problem we face. 40% of the food we produce, package, and purchase in the United States ends up uneaten and untouched in landfills across the country. There are many different parts of our food system that we can attribute the food waste problem to, considering that significant food loss occurs in production, transportation, distribution, and consumption. Because the problem is so deep rooted in the way the American food system operates, it is going to take large-scale systemic technological, behavioral, and social change to eliminate food waste. It is imperative to address the various stages at which this waste occurs to find a solution that considers the entirety of the problem rather than honing in on one specific aspect of it. Eliminating food waste will require a change in the relationship between people and the food they eat in addition to local and national understanding of appropriate production, and it is imperative to implement technological and social systems that will allow this shift to happen.

Currently, composting is not a regular part of most people's lives. Over many years, recycling has become a cultural normality and people better understand how/what to recycle and generally expect a blue bin next to trash cans. In the same way that recycling has become expected and commonplace, compost must also become a part of daily life to help solve the food waste problem. We have so much food that we don't eat, in the household and on a larger national scale, and we lack the technology and diligence to appropriately recycle this food in useful and ecologically thoughtful ways. Not only does compost keep tons of food out of overflowing landfills, but it allows the food to naturally decompose and then be reused to fertilize and enrich soil and the earth. Compost is a valuable tool that keeps soil rich, moist, and fertile and aids the growth of agricultural products, so it would be significantly beneficial for many reasons to capture our food waste and turn it into compost. Ideally, compost pickup would become incorporated into the typical trash and recycling pick up system that we are all used to, whether is be a municipal or private service. To successfully incorporate compost into our everyday waste disposal systems and habits, it needs to become regularized in the same way traditional trash and recycling are. Where there are trash and recycling receptacles, there can also be a food waste/compost bin, both in households and public places. If garbage trucks also collect compost, it will make it easy and relatively convenient for households to shift away from throwing food scraps into the regular trash. A three-type waste system that allows food to be composted instead of thrown out will seriously



decrease food waste that ends up in landfills. By repurposing uneaten food into a valuable agricultural additive, we can not only eliminate the prevalence of food waste in landfills but can also advance food growth efforts on a local scale. If behaviors can change systematically and all people compost their food scraps, essentially all food waste can be captured and turned into compost.

In addition to composting the food we have already grown/made but do not eat, we must also produce less food in the first place by more accurately considering the true demand for food in the United States. We live in a society of surplus and overproduction, where it is always better to have too much than too little. In order to assess how much food is actually needed to sustain communities and not produce so much more than could ever be eaten, food production needs to be shifted to become a more local process. Instead of massive CAFOs making and growing most of the food the country eats, smaller localized farms should be the main producers not only because smaller agricultural operations have less ecological impact, but also because localized food production will more accurately understand the reality of the local consumption needs. Ideally, to eliminate excess production, our food system would shift from large industrial farming to smaller scale, local, sustainable farming. If each farm is providing for only one or two localities, they will be able to more accurately assess how much food is actually needed and therefore not overproduce beyond the communities consumptive needs. Because local farms would be influenced by the climates in which they are located, agricultural technology could be used to help maximize yields in the growing season and assess which varieties crops will be the most successful in that part of the country. This model should include both community farms and individual household farms, which together with technological assistance can sufficiently feed the local populations. The compost collected as a part of regularly weekly trash pickup can also be redistributed to these household and small community farms to fertilize their soil and help increase agricultural yield and quality. A new system of efficient, local farming could arise to replace the current industrial CAFO model, eliminating excess food production to more accurately match the food demand in local populations and also promoting sustainable agriculture within communities.

By composting essentially all food scraps and reshaping the current agricultural production system, it is possible to imagine the reality of a food waste free society. According to these plans, in 2040 every person will eat food grown locally in considerate moderation, tailored to the populations' consumption patterns and needs. Food will not be grown and produced to excessive surplus because each farm will grow only as much as their community needs. All food that is not eaten will be composted in the home and from the farms, and the collection, handling, and redistribution of compost as fertilizer will be a municipal service in the same ways that trash and recycling currently are. As the project continues on, we will find more ways to fix the flaws in our food system and use technological and social changes and advancements to further eliminate food waste.

Scientist 2:

Ever since the devastating three-year drought of 2019, the United States has been driven to recreate their systems of food production, transportation, and disposal, in a way that would be more environmentally friendly. The first step in this was the dismantling of large-scale industrial farming use, while moving towards a mostly small farm model in which each family would have their own small farm on their land, or if they lived in a city they would have access to rooftop gardens for fresh food. This would have been an impossible system to implement before the drought, however in the years since the drought the culture of the people of the United States has warped massively. Now in 2040 people actually want to spend the time to work on these farms so that they have more nutritious fresh food that hadn't been transported a thousand miles to them. Luckily this actually solves two of the major problems that had to be dealt with, both production and transportation. Production is much more easily managed because people would be able to gauge the amount they grow on how much they would want to eat. While before this change industrial companies would have to guess at how much people would buy, most likely overestimating on purpose to make sure they didn't run out of product, while also creating a lot more waste.

The third problem which would need to be dealt with is how exactly food scraps would be reused instead of disposed. If you look at the food recovery hierarchy from before the drought, you can essentially see the process used today if you enlarge the other five layers to fill in what was Landfill/Incineration. One of the largest used solutions was a promotion of composting. This came in two forms, first those who had enough land would create their own private composting pile, while in cities municipal composting centers would be erected, and a third bin would be left out for people to put their food scraps into so they could be collected. This effectively solved the problem of any food waste created by the farms themselves, however some more specific solutions were needed for other foods, such as meat farms. Each of these farms would need to make sure they are using any usable part of the animal, including grinding up the bones for fertilizer.

The last problem was raised once the problem of how to dispose of food waste was reached, and this problem is how to monitor all of this to make sure that people are really abiding by the rules, and that small farms don't use and GMO plants, or that they don't try to hide their food waste. To combat this problem sensors were put into grocery stores so that the amount of food you buy can be accounted for. Along with this any private farms/composting must be recorded, this makes it so that if someone is under question you can look at how much they buy, and how large their garden is and see if it matches up to the amount of compost that they create.