The Clean Plate Club? Food Waste and Individual Responsibility

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1. Introduction

If your childhood was anything like ours, you were probably admonished for leaving uneaten food on your plate through the invocation of starving children in distant lands. This used to drive one of us up the wall (incidentally, the one who become the philosopher: the other was a much less picky eater). Given that the food on his plate could not possibly end up feeding anyone else, what good did it do to hitch his distaste for broccoli to his empathy for the suffering of others?

Indeed, this nascent thought is one that we will develop further in this chapter. The point, of course, is not that one should not have empathy for the suffering of others or ignore opportunities to relieve it. Nor will we argue that reducing the waste that you produce (be it food or otherwise) isn't in general a good thing to do. Rather, the concern is with linking a morally important goal (the reduction of starvation) with a phenomenon that has a tenuous causal (and perhaps moral) relationship to it. There is a surprising disconnect between virtue- and vice-based objections to waste in individual behavior and the more consequentialist concerns with hunger and carbon emissions that often arise in the context of food waste discussions.

To be sure, we have a problem. It is not a good thing that close to half of the food that we produce is ending up in landfills. In what follows, we will try to tease out some of the ethical complexities involved in confronting this problem and how it is framed. We will devote special attention to the problems of hunger and carbon emissions and their relationship to individual food behaviors. In doing so, we will suggest that there is often a misleading link made between these serious problems and individual waste behavior. Ultimately, we will conclude that, while there is certainly nothing wrong with trying to reduce your individual food waste, cultivating virtues of civic engagement geared toward systemic change in food production and distribution is more important than fostering extreme individual efficiency of food use.

2. The Facts About Food Waste

To begin, it will be helpful to review the empirical lay of the land. From an empirical perspective, food waste is a complicated concept where the rigorous quantification of waste and its impacts are contingent on the food life cycle, which considers the processes by which food is produced, transported, sold, consumed, and disposed (FIG. 1). Waste is created at every level along the food production life cycle, where it generally falls within one of the following four categories:

1) Inefficient resource use: input resources (fossil fuels, water, etc.) that are ineffectively used if they don't produce food for consumption
2) Production waste: greenhouse gas emissions and pollution
3) By-products: otherwise unusable that are transferred with edible food
4) Wasted food: edible calories lost

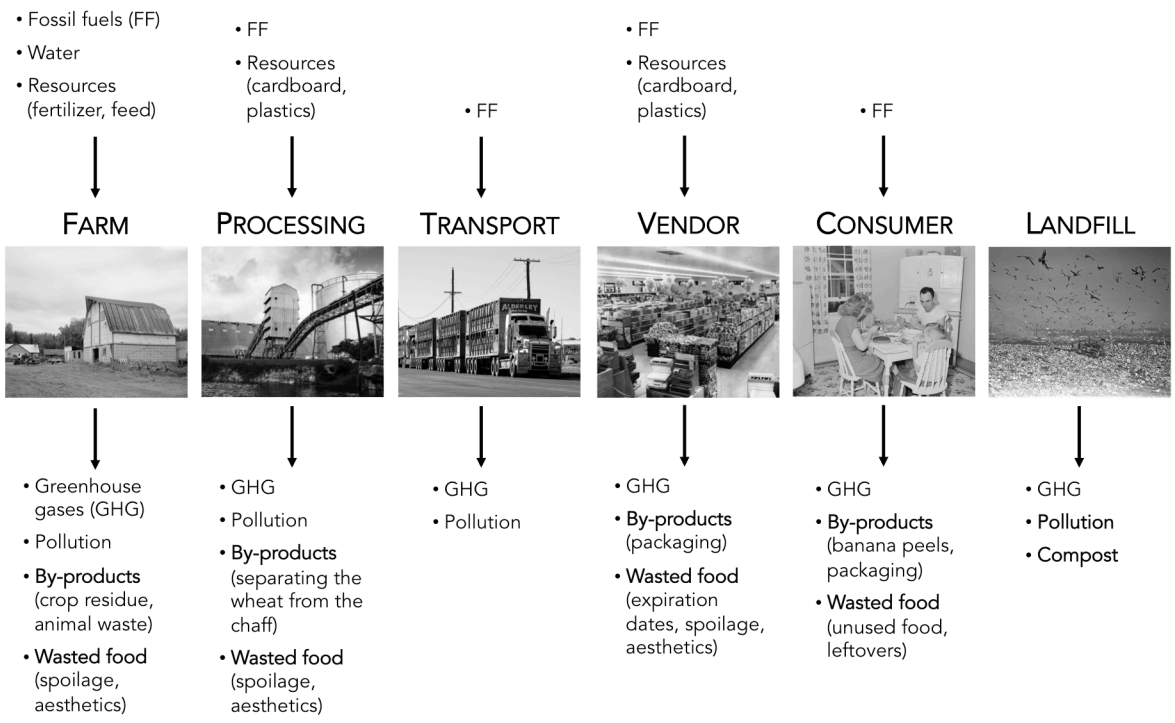

FIG 1. Life cycle of the food system with associated inputs and outputs.

The agricultural systems that produce food require the extensive mobilization of input resources to sustain high rates of productivity. Globally, 70% of freshwater water withdrawals are devoted to irrigation for agriculture,[1] and the quantity of reactive nitrogen synthesized for agricultural fertilizers exceeds the amount of nitrogen cycled through all natural pathways combined.[2] Agriculture also produces pollution that deteriorates important ecosystem services such as water availability, water quality, and biodiversity,[3] and fertilizer runoff from agricultural systems is the dominant cause of pollution in the U.S.[4] Agriculture and the entire food system is also a major source of greenhouse gases, including carbon dioxide, methane, and nitrous oxide, the three most important drivers of global climate change.[5]Agricultural systems cover 38% of Earth's ice-free land,[6] where the widespread land conversion from previous ecosystems is a primary driver of global biodiversity

[1] Postel, S. L., Daily, G. C. & Ehrlich, P. R. Human appropriation of renewable freshwater. Science 271, 785–788 (1996).
[2] MEA, Millenium ecosystem assessment. In *Ecosystems and human well-being: biodiversity synthesis*. Washington, DC: World Resources Institute (2005).
[3] Power, A. G. Ecosystem services and agriculture: tradeoffs and synergies. Phil. Trans. R. Soc. B 365, 2959–2971 (2010).
[4] Vitousek P. M., Aber J. D., Howarth R. W., Likens G. E., Matson P. A., Schindler D. W., Schlesinger W. H., Tilman G. D. Human alteration of the global nitrogen cycle: sources and consequences. Ecol. Appl. **7**,737–750 (1997)
[5] Ciais, P., C. Sabine, G. Bala, L. Bopp, V. Brovkin, J. Canadell, A. Chhabra, R. DeFries, J. Galloway, M. Heimann, C. Jones, C. Le Quéré, R.B. Myneni, S. Piao and P. Thornton, 2013: Carbon and Other Biogeochemical Cycles. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
[6] Ramankutty, N., Evan, A. T., Monfreda, C. & Foley, J. A. Farming the planet: 1. Geographic distribution of global agricultural lands in the year 2000. Glob. Biogeochem. Cycles 22, GB1003 (2008).

loss.[7] These negative externalities are typically justified as means to producing the enormous quantities of food necessary for the exponentially growing human population. But in addition to the direct problems created by discarded edible food at later levels in the food system, wasted food also carries the burden of inefficient resource use of inputs and unjustifiable production waste through the creation of unnecessary greenhouse gas emissions and pollution.

After food is produced in agricultural systems, depending on the type of food, significant by-product waste is generated during food processing. Although most food by-products are discarded as municipal solid waste, the large and increasing global volume of waste at this level is driving research for the production of "second generation" fuels and chemicals produced from by-products.[8] However, by-product re-use currently constitutes less than 0.5% of total by-product waste. During the post-agricultural stages of the food system, waste is also generated by inefficient use of the tremendous amount of fossil fuel energy required to process, transport, and distribute food. Although processing can prolong the shelf life of food, therefore increasing the odds that it will be purchased and consumed, the mobilization of raw materials that are required to produce a typical bag of vending machine snack mix is astounding. Energy consumption at the Processing through Vendor levels of the food system represented 8% of the total U.S. energy use in 2007, with the largest energy consumption at the Vendor level.[9,10]

Enormous quantities of edible wasted food are also created at the Processing and Vendor levels of the food system. Globally, 1-30% of rice and 2-50% of fresh fruits and vegetables are lost as wasted food following agricultural production and never reach individual consumers.[11] Although there are insignificant differences in the total quantity of wasted food from differently resourced nations, reasons for post-agricultural losses differ. In tropical nations, spoilage due to rainy and/or hot weather events is the most important driver of food waste, whereas in the U.S. and U.K., most food is wasted due to aesthetic selection for perfect products.[12] At the Vendor level in the U.S., up to 10% of total produced food is wasted[13] for reasons that include overstocking, cosmetic "defects," and expired "sell by" dates. Several European vendors recently launched campaigns to convince consumers to overcome stereotypes regarding perfect produce and reduce wasted food, offering lower prices on "weather blemished apples" in the U.K. and "inglorious fruits and vegetables" in France.[14] Labeling perishable foods with "sell by" dates at the Vendor level has also generated recent

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[7] Foley, J. A., N. Ramankutty, K. A. Brauman, E. S. Cassidy, J. S. Gerber, M. Johnston, N. D. Mueller, C. O'Connell, D. K. Ray, P. C. West, C. Balzer, E. M. Bennett, S. R. Carpenter, J. Hill, C. Monfreda, S. Polasky, J. Rockström, J. Sheehan, S. Siebert, D. Tilman, D. P. M. Zaks, Solutions for a cultivated planet, Nature (2011).

[8] Lin, C. S. K., L. A. Pfaltzgraff, L. Herrero-Davila, E. B. Mubofu, S. Abderrahim, J. H. Clark, A. A. Koutinas, N. Kopsahelis, K. Stamatelatou, F. Dickson, S. Thankappan, Z. Mohamed, R. Brocklesby, R. Luque. Food waste as a valuable resource for the production of chemicals, materials, and fuels. Energy and Environmental Science 6: 426-464.

[9] U.S. Energy Information Administration, Primary Energy Consumption by Source. U.S. Department of Energy, Washington, DC (2016).

[10] Cuéllar, A. D. and M. E. Webber. Wasted food, wasted energy: The embedded energy of food waste in the United States. Environmental Science & Technology 44(16): 6464-6469 (2010).

[11] Parfitt, J., M. Barthel, S. Macnaughton. Food waste within food supply chains: Quantification and potential for change to 2050. Philosophical Transactions of the Royal Society B: Biological Sciences 365(1554): 3065-3081, (2009).

[12] Ibid.

[13] Buzby, J. C., J. Hyman, H. Stewart, H. F. Wells. The value of retail- and consumer-level fruit and vegetable losses in the United States. The Journal of Consumer Affairs 45(3): 492-515, (2011).

[14] Godoy, M. "In Europe, Ugly Sells in the Produce Aisle", National Public Radio, 9 December 2014, http://www.npr.org/sections/thesalt/2014/12/09/369613561/in-europe-ugly-sells-in-the-produce-aisle.

public scrutiny, since these dates are not regulated through any system nor do they indicate food safety.[15] Labeling confusion about sell by dates initiated at the Vendor level was responsible for up to 20% of wasted food at the Consumer level in the U.K.[16]

The Consumer level of the food system primarily creates wasted food and food by-products that are sent to landfills. The wasted available U.S. food supply has grown from 30% in 1974 to near 40% in 2009, even after accounting for the increased caloric consumption that is driving America's obesity epidemic.[17] Rates of food waste production can be even higher in some communities, where a study in Ithaca-Tompkins County in New York State (the location of Cornell University and its 19,000 students) found that 60% of edible food was wasted and 72% of that wasted food was sent to landfills.[18] Reasons for the creation of wasted food vary, where people discard potentially edible food due to actual or perceived spoilage, over-buying, or simply because they didn't like something. Although donations of unused or unwanted canned or packaged food capture a very small volume of food waste (3% of wasted food in the Ithaca-Tompkins County study), the relatively short shelf life of items like fresh fruits and vegetables, milk, eggs, and meats has challenged the feasibility of donation schemes for perishable food from individual households, and most of this food ends up in landfills. The Consumer level also accounts for the most significant disposal of food packaging by-product waste. Packaging, including glass, metal, plastic, paper, and paperboard, produced 31% of U.S. municipal solid waste in 2005, where two-thirds of that fraction represented food-packaging by-products.[19] Food packaging can increase the shelf life of foods and is an important component of food convenience, traceability, and marketing.[20] While most food packaging is recyclable, in practice only 6-50% of packaging by-products enter recycling streams for partial resource recovery[21].

The majority of wasted food and waste by-products from all levels of the food system end up in landfills, where the most significant impact is created through the formation of greenhouse gases by food and by-product decomposition. Wasted food represented 14.6% of total municipal solid waste entering U.S. landfills in 2013.[22] Although both food by-products and wasted food are often compostable, in practice only 3% of food waste is composted in the U.S.[23] mostly due to the lack of composting infrastructure. Within landfills, wasted food and by-products rich in organic matter fuel the growth of methane-producing microbes, which thrive within the low oxygen

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[15] Gunders, D. Wasted: How America is losing up to 40 percent of its food from farm to fork to landfill. NRDC Issue Paper, IP:12-06-B, National Resources Defense Council, Washington, DC. (2012).

[16] WRAP, "Consumer Insight: Date labels and storage guidance", May 2011, www.wrap.org.U.K./downloads/Technical_report_dates_final.cf179742.11175.pdf.

[17] Hall, K. D., J. Guo, M. Dore, C. C. Chow. The progressive increase of food waste in America and its environmental impact. PLoS One 4(11): e7940.

[18] Griffin, M., J. Sobal, T. A. Lyson. An analysis of a community food waste stream. Agriculture and Human Values 26: 67-81. (2009).

[19] Marsh, K. and B. Bugusu. Food Packaging – Roles, Materials, and Environmental Issues. Journal of Food Science 72(3): R39-55. (2007).

[20] Ibid.

[21] Ibid.

[22] U.S. EPA, **"**Total MSW Generation (by Material), 2013", 2016. https://www3.epa.gov/epawaste/nonhaz/municipal/images/2012_totl_msw_gen_fig4_lg.png

[23] U.S. EPA, "Municipal Solid Waste Generation, Recycling and Disposal in the United States: Tables and Figures for 2010," www.epa.gov/osw/nonhaz/municipal/pubs/2010_MSW_Tables_and_Figures_508.pdf

condition of landfills. Globally, landfills produce 25-27% of all anthropogenic methane emissions[24] and in the U.S. landfills represent 18-25% of anthropogenic methane emissions,[25] which is a greenhouse gas 82 times more powerful than carbon dioxide on a 20-year timeframe. Composting wasted food and by-products emits less total greenhouse gases than landfilling and promotes the cycling of renewable soil resources, however municipal compositing facilities tend to be more energy intensive than landfills.[26]

3. Conceptions of Waste

With these facts about the extent and variety of food waste problems in mind, it is helpful to step back and consider the different ways in which the concept of waste itself can be understood. The discussion so far has assumed a common-sense understanding of waste, or one that is given an operative definition in the scientific literature. Upon further analysis, it may turn out that using waste in these ways is misleading; or, alternatively, that the concept of waste is broader than it initially appeared. However, we should of course be wary of arriving at a conception of waste that is too revisionist, rendering our common use of the term unintelligible.

For one, waste can be understood in both a descriptive and a normative sense. A normative concept is one that carries with it a prescription in favor of or against a certain action, attitude, state of affairs, etc., whereas a descriptive concept lacks any direct implications concerning how things should be. So, for example "death" is a descriptive concept, whereas "murder" is normatively laden. Although we may often have negative associations with death, we can use it as a purely descriptive concept that indicates whether or not an organism is alive. On the other hand, to invoke the concept of murder is to indicate that the action should not be performed (as in "but that would be murder!").

Insofar as there is a descriptive sense of waste, it seems to refer simply to the by-product of a process, or what is left over. So, for instance, we might descriptively refer to a cantaloupe rind or carrot peels as waste. If it is true that these items are waste in the descriptive sense, than by identifying them as waste, we don't imply that their existence is to be avoided. And this does seem true: we don't generally bemoan the production of carrot peels the way we do the production of bread that goes uneaten. This is of course not to say that there might not be better or worse things to do with this waste (e.g. compost it vs. send it to a landfill). Though we often have unpleasant associations with it, excrement is also a form of food waste, in the descriptive sense. As new parents who deal with a lot of waste from a tiny human, we can certainly attest to the unpleasantness of this waste, but it's certainly not a bad thing: on the contrary, proper production of waste is a sign that your child is healthy.

However, in the context of food, "waste" is seldom deployed in the descriptive sense. Rather, to identify food waste (whether in a household, a supermarket, or an agricultural operation) is typically to make a claim about something that ought not be done. We don't usually need to make explicit the claim that food ought not be wasted, any more than the claim that people ought not be murdered, because these are normative concepts that carry with them a prescription against their enactment.

It is helpful to recognize that waste is typically invoked in a normative sense, especially when it comes to food, because it can draw out attention to cases where there may be slippage between

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[24] Ciais, P., *et. al.*, (2013)

[25] U.S. EPA, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013", U.S. Environmental Protection Agency, Washington, DC, (2015).

[26] Lou, X. F., J. Nair. The impact of landfilling and composting on greenhouse gas emission – A review. Bioresource Technology 100(16): 3792-3798, (2009).

descriptive and normative uses of the concept (as in the pizza example that we discuss below). Indeed, it seems that even the kind of thing picked out by these two senses of waste is itself different. As noted above, it seems like waste is usually used in the descriptive sense to identify the by-product of a process. However, when used in the normative sense, waste seems less to refer to the by-product of a process than to something that has failed to be used or whose potential is unrealized. This in itself may not be too surprising: after all, if by-products are inevitable, and the philosophical dictum of "ought implies can" holds, then it would be strange if we had a normative concept that referred to such by-products as things that ought not be produced. This is of course not to say that we don't make further normative claims about what we ought to do with waste by-products, as in the case of carrot peels discussed above: we might for instance, think they ought to be managed by appropriate waste treatment facilities, but note that the "waste" in "waste management" is being used in the descriptive sense. It is intriguing to realize that the single concept of waste can refer both to the conclusion of a process and to a process that was never begun.

While our empirical overview above describes many forms of waste that occur in the production and distribution of food, we can see that the term "food waste" in the literature is typically understood (normatively) as food that is uneaten (Category 4). Note that in this context, waste is defined relative to a specific purpose, i.e. nourishment: it would still be wasteful to use canned goods as doorstops, even though they are being put to use. It seems to follow that food that is eaten is not wasted, at least within a reasonable range of consumption habits. This is certainly the implication of the childhood chastising that we introduced at the outset of the paper: if you just eat the leftover broccoli on your plate, then it will not have gone to waste. To be sure, we can acknowledge that gluttonous gorging on food might be wasteful, even though the food is eaten, but this kind of consumption is not typically counted as "waste" in the studies discussed above.[27] However, it is reasonable to ask: Why not? How should we really understand the concept of "waste" in these discussions? Perhaps there is justification for thinking of waste in even stronger terms than are typically employed in the empirical literature. As Mark Sagoff notes in a broader discussion of our consumptive practices: "defining or characterizing wastefulness may be an essential task in determining what we most need to reform about the way goods are produced and consumed."[28]

Philosophers have not written an extensive amount about waste, when it comes to food or otherwise. Yet common themes emerge in these writings that call into question the straightforward understanding of food waste as uneaten food that seems to be operative in the empirical literature. For instance, Michael J. Thompson appears to define waste as follows: "waste comes into play whenever some thing, or some person, or some group, or aspect of nature is unable to bring forth into the world the maximum of its abilities and potentialities, either because of non-use, under-use, or misuse. For an activity not to be wasteful, it needs to be able to satisfy the greatest amount of potential needs that any specific resource possesses and it also has to be able to employ resources for the benefit of the society as a whole, and not merely for an exclusive part of, or at the expense of it."[29] Note that this is a far more radical construal of waste than then the sense employed in the statistic that roughly half the food we produce is wasted. That statistic uses 'waste' in the conventional sense found in discussions of food waste; namely, food products that are thrown out without being consumed. According to Thompson's definition, on the other hand, any food that is not made maximally beneficial to society as whole is wasted. This would seem to entail that much of

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[27] Though there are exceptions. For example, see Hall et al., 2009.

[28] Mark Sagoff, "Consumption," in *A Companion to Envrionmental Philosophy*, ed. Dale Jamieson (USA: Blackwell, 2001).

[29] Michael J. Thompson, "On the Ethical Dimensions of Waste," *Archives for Philosophy of Law and Socail Philosophy* 101, no. 2 (2015): 255-6.

the food that we eat as individual consumers is in fact "wasted" since it could better meet societal needs if it were redistributed to those who are hungry.[30] [31]

Implications of this kind can also be found in accounts of waste that are at pains to pick out a definition that gels with our pre-theoretical intuitions about the concept. Andrew Jason Cohen provides an exhaustive analysis of waste that is tightly circumscribed by various common uses of the term.[32] He argues that waste is "(a) any process wherein something useful becomes less useful and that produces less benefit than is lost—where benefit and usefulness are understood with reference to the same metric—or (b) the result of such a process," ultimately suggesting that it is wrong to prevent someone else from using what you are wasting, by your own lights, though tempered by the qualification that it is for the sake of the others' preservation.[33] Though this is not as radical as the maximizing account suggested by Thompson, it is still predicated on the idea that waste results at any time that something could be "better" used. Bernard Baumrin notes that according to a maximizing utilitarian, any time that is not spent making the world better is "wasted," yet another way of describing the demandingness of that moral theory.[34] Yet a further remark draws out the fact that we need not think of usefulness in maximizing terms in order to arrive at the conclusion that much of our time is wasted, morally speaking. He notes: "Acts are not morally neutral when they have as a consequence the failure to do something else of great value, and, though it might go without saying, there is always something of value worth doing."[35] Even if we do not adhere to the notion that we should always be making the *best* use of some resource (be it time, food, or something else), the idea that a resource is wasted when we could even do something *better* with it already places significant normative demands on how our resources are employed. Indeed, all of the philosophical reflections on waste briefly described here yield a normative conception of waste that is far broader, and consequently more demanding, than the conception that we typically employ.

Thompson, Cohen, and Baumrin all begin their analyses of waste with reflections on Locke's second proviso on property: "As much as any one can make use of to any advantage of life before it spoils, so much he may by labour fix a property in: whatever is beyond this is more than his share, and belongs to others."[36] But perhaps we should pause before predicating our understanding of waste on the thoughts of a philosopher who viewed the pre-colonization Americas as "wild woods and uncultivated waste."[37] Putting aside the fact that Locke was simply wrong in claiming that Native Americans had not actively shaped their environment, this claim illustrates the dangers in

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[30] This evokes Peter Singer's argument that we ought to reduce ourselves to the level of marginal utility in order to assist suffering others. Peter Singer, "Famine, Affluence, and Morality," *Philosophy and Public Affairs* 1, no. 3 (1972).

[31] Interestingly, this very idea is explored in Dorothy Blair and Jeffery Sobal, "Luxus Consumption: Wasting Food Resources through Overating," *Agriculture and Human Values* 23 (2006). They define "luxus consumption" as "consumption beyond metabolic need" and assess the ecological impact of its increasing prevalence in United States in the 1990s.

[32] Andrew Jason Cohen, "A Conceptual and (Preliminary) Normative Exploration of Waste," *Social Philosophy and Policy* (2010).

[33] Though Cohen's formulation implies that self-preservation is a sufficient, not necessary, condition for such wastefulness to be morally wrong.

[34] Bernard Baumrin, "Waste," *Journal of Social Philosophy* 24, no. 3 (1993): 11.

[35] Ibid., 18.

[36] John Locke, *Second Treatise*, II. 31

[37] Ibid. (check reference)

thinking of waste only in relation to potential use.[38] Not all who wander are lost, and surely not all that is unused is wasted. To view wilderness as a wasteland betrays an evaluative outlook perverted by utilitarian preoccupations.

It may feel as if we have now gone far afield of our primary topic. You might agree that viewing all uncultivated land as waste is a mistake, but note that the application of this thought to the issue of food waste is unclear. After all, food has already been cultivated: it has an explicit purpose that is not being met when it is simply thrown away. However, the tight connection between waste and potential use may have more dramatic implications for our thinking about individual food waste than it initially appears.

If individuals wasting food is a vice, consider the corresponding virtue. On a strict use-based understanding of waste, it seems that virtue would be something like *efficiency*: every item is used for its intended purpose (where on some accounts this will be it's *best* purpose, variously defined). So with regard to individual food consumption, you should make sure that all the food that you purchase for consumption is eaten. To the extent that you fail to do this, you are wasting food. This is in essence the goal that the United States EPA promotes in their literature on food waste.[39] However, as with other virtue/vice pairs, it is not obvious that taking any means to avoid a vice renders your action virtuous. Think of a time you were at the dinner table, fully sated, with a single slice of pizza left in the box. Everyone is stuffed, but inevitably someone will pick up the slice, intoning the maxim that "we shouldn't let it go to waste." We doubt we're alone in recalling many such scenarios. Is eating the last slice of pizza so as to avoid "waste" an instance of virtuous behavior?

According to Aristotle's "doctrine of the mean," virtues are always the point of moderation between two vicious extremes. Now, many philosophers have critiqued the doctrine of the mean as a general account of the virtues, but that doesn't mean that Aristotle wasn't on to something. Thinking about our individual behavior with respect to food waste looks like a good example. While it certainly seems like a vice to gratuitously throw out edible food, it also seems problematic to seek perfect efficiency in our food habits, either by gorging ourselves in order to avoid "waste," or, for that matter, through obsessive calorie counting in an effort to purchase the precisely correct amount of food for your household. That level of moral fussiness doesn't exactly feel like a virtue, anymore than obsessively telling the truth (even to the proverbial murderer at the door) exemplifies the virtue of honesty.

These brief thoughts suggest that, upon reflection, we are not actually inclined to think of waste, in the normative sense, exclusively in relation to potential use: we don't really think that *every* missed opportunity to use something is objectionably wasteful, and indeed, the pizza example suggest that slippage between the descriptive and normative senses of waste can have somewhat perverse consequences. Recall that earlier we noted that it seems like waste is usually used in the descriptive sense to identify the by-product of a process, whereas it is used in the normative sense, to refer to something that has failed to be used or whose potential is unrealized. Rather than regarding the leftover slice of pizza as the descriptive waste by-product of a delicious dinner, the use-based food waste concept mistakenly compels us to regard it as the normative waste of unrealized potential.

While waste certainly is not unrelated to potential use, the examples considered so far suggest that an important element in our normative understanding of waste is that it is *gratuitous*: our sense of wastefulness is not predicated only on potential use (itself a descriptive notion), but rather

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[38] For discussion, see John O'Neill, "Wilderness, Cultivation and Appropriation," *Philosophy & Geography* 5, no. 1 (2002).

[39] "Reducing Wasted Food at Home," https://www.epa.gov/recycle/reducing-wasted-food-home, 3/31/16

on a prior normative understanding of *appropriate* use that sets limits on deficient and excessive use. On this conception of waste, we can make sense of how both non-use and excessive use can qualify as wasteful.

This may be why we find aggregate statistics about individual food waste so troubling: we don't think it's appropriate at all to simply throw out a third of the food we buy. This is not just a waste of food, of course, but also a waste of money: we certainly don't think it's appropriate to effectively burn our money. Interestingly, though, the individual instances of non-use that add up to these troubling statistics may not seem inappropriate to us at all. Some salad greens are wilted and slimy, so we throw them out. The last serving of cereal has gone stale, so we throw it out. The milk is starting to smell rancid, so we throw it out. Surely, if half the carton has spoiled, we are likely to bemoan this as a waste, but a little milk that turns before anyone gets around to drinking it is just the cost of doing business. Again, we're not perfectly efficient predictors of our food needs.

Of course, there are many everyday behaviors that can seem troubling when we aggregate them. There's very little we're willing to drop $300 on, yet spending less than a dollar a day seems like no big deal (hence the prevalence of converting to daily metrics in marketing). Clearly there is a framing effect at work here that affects our judgments about what is appropriate to spend or waste, but it's not obvious that the aggregate frame is necessarily the right one to employ. Indeed, when it comes to our normative thinking about individual actions, it is not implausible to think that the aggregate frame may be the distorting one.

Recognizing that our understanding of waste depends not merely on potential use but on a prior normative understanding of appropriate use also accounts for cultural variability in the norms surrounding what is regarded as waste. This is a welcome consequence, and, contrary to appearances, does not raise the specter of moral relativism. For example, though we might agree that disrespecting another person is, other things being equal, universally morally objectionable, surely what qualifies as disrespect will be deeply embedded in various cultural norms. To acknowledge that what qualifies as waste will vary cross-culturally is not to slide into cultural relativism, but to be appropriately sensitive to the diversity of cultural norms and the ways they inform a potentially universalizable set of thick ethical norms. There is a worry here that this move will excuse wasteful behavior that seems intuitively problematic but is acceptable within a given cultural context. But this is not an *ad hoc* effort to give an easy pass to the affluent, chalking up their less efficient use of resources to a more permissive waste-norm. Indeed, there are a variety of cultural practices, from the potlatch ceremonies of the Pacific Northwest tribes to the ritual destruction and reconstruction of temples in parts of Laos might be regarded as "wasteful" according to certain Western cultural norms.[40] Neither does it render anyone immune from waste-based criticism of their practices. It simply encourages us to think about waste in the context of the various cultural norms within which understandings of appropriate use will inevitably be embedded.

Another welcome consequence of acknowledging the cultural roots of use-norms is that these norms are sensitive to influence and change. Indeed, we have seen examples of such changes. Consider, for instance, the rise of recycling or the increasing occurrence of dryscaping in the western United States. These are instances in which behaviors that were once regarded as culturally acceptable (sending all of your garbage to landfills, expending excessive volumes of water on cultivating a grass yard in an unfit climate) became regarded as wasteful. Thus if we can zero in on an independently justifiable understanding of appropriate use for a given cultural context, we can

[40] For discussion of the latter practice, see Anna Karlstrom, "Authenticity," in *Heritage Keywords*, ed. Kathryn Lafrenz Samuels and Trinidad Rico (USA: University Press of Colorado, 2015).

argue that it ought to be adopted and that we ought to engage in campaigns to alter cultural norms surrounding waste in that context.

4. Food Waste and Individual Responsibility

What might this argument look like in the context of food waste? One approach might be to pursue a strictly non-consequentialist justification. So, for example, we might argue that leaving broccoli uneaten on your plate when other people are starving is *disrespectful*, and that's the concern that ought to drive our moral thinking about food waste, independently of whether cultivating a norm against uneaten broccoli has any effect on reducing the incidence of starvation. This approach is not without its appeal. However, it is worrisome to disconnect our thinking about waste norms from the consequences of our actions when there is so much that needs to be done in confronting the relevant problems. This is especially so if, as we discuss below, focus on our individual wasteful behavior might disincline us to pursue other activities that could make more of a difference. Moreover, it is difficult to spell out what precisely is disrespectful about not eating while others go hungry. In many contexts this behavior will be private, so it will not *express* disrespect towards anyone in particular. And it is not clear what general principle of respectfulness the claim about food waste might be an instance of. It certainly does not seem to be true that it is disrespectful to forgo *any* opportunity just because it is unavailable to someone else. Nor does this even seem to be the case for injustices regarding other basic needs (is it disrespectful to forgo sleep when others are unfairly tired?). This is not to say that there is no way to make out this argument, but appeal to disrespect does not seem to provide a straightforward explanation for why we should cultivate certain cultural norms surrounding food waste.[41] Although arguments against vices can of course come apart from strictly consequentialist concerns, this is a context in which *some* relationship to the production of helpful consequences seems desirable.

So compare with the other two examples mentioned in the previous argument. Now, on the one hand, there are familiar philosophical worries about our moral obligations to modify individual behavior when our individual actions seem to make no difference.[42] These collective action puzzles will be addressed directly in other chapters in this volume.[43] However, putting those worries aside, we can see how large numbers of people modifying their behavior with respect to recycling and dryscaping could collectively have a significant impact on resource-use. And if we have good moral reason to improve our resource-use in these ways, then we might argue that we ought to attempt to shift cultural norms in a way that will help achieve those goals. But what of individual food waste? What would be the consequences of large numbers of people altering their food consumption habits?

Surely the answer to this question will depend not just on how individuals conceive of wasteful behavior, but what kinds of actions they take to combat wastefulness (e.g. being a card-carrying member of the Clean Plate Club). Let's consider, for the sake of argument, that we ought to modify our norms such that all uneaten (or gluttonously eaten) food is regarded as wasteful. Now, consider two different ways in which individuals might modify their behavior in order to avoid being wasteful. First, they might *Buy Better*, modifying their food purchasing behavior so as to reduce the

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[41] Thanks to Kate Nolfi for pressing us on this point.

[42] For example, see, Jonathan Glover, "It Makes No Difference Whether Or Not I Do It," *Proceedings of the Aristotelian Soceity, Supplementary Volumes*, Vol. 49 (1975), pp. 171-209; Shelly, Kagan, "Do I Make a Difference?" *Philosophy and Public Affairs*, 39. No. 2; " Walter Sinnott-Armstrong, "It's Not *My* Fault: Global Warming and Individual Moral Obligations," in Stephen M. Gardiner et al., eds., *Climate Ethics* (New York: Oxford University Press, 2010).

[43] In particular, see Julia Nefsky, TITLE, this volume.

amount of purchased food that goes to waste. Second, they might maintain their food purchasing behavior but *Distribute Better,* modifying their food donating behavior by making a concerted effort to ensure that purchased food that they will not consume will be distributed to the hungry (for instance, via local food banks). These are both suggestions made by the EPA.

What will be the consequences of Buy Better? For one, individuals would throw out less food, because they would do a better job purchasing only what they need. This on its own would have an impact on methane emissions from landfills (again, we are assuming that large numbers of people are engaging in these behavior modifications). While landfills represent a significant fraction of anthropogenic methane emissions, the burden of these greenhouse gases represents a small fraction of individual carbon emissions compared to the amount of carbon used in fossil fuel combustion for transportation, heat, and embedded within other goods and services. Even if 75% of the 2013 U.S. landfill methane emissions were produced by wasted food (an estimate on the high end) and assuming that these emissions were spread among the U.S. population over the age of ten, these emissions represent just 2.5% of the total average individual U.S. carbon footprint.[44] Although this is a small fraction of the average individual carbon footprint, we can put this value into context by considering that 19% of the individual carbon budget is used for vehicle fuel, 15% for electricity generation, 5% for health care, 4% for air travel, and 1.5% for clothing (a meager value when considering the resources spent on green marketing of eco-chic fashion).[45] While the potential direct impacts of wasted food on landfill methane emissions are relatively small at the individual level, so are the carbon impacts of most goods and services. That carbon emissions are embedded within essentially everything that we use to support and enjoy our lives highlights the 'death by a thousand cuts' nature of climate change, where we may incur benefits from even modest carbon savings. From a different perspective, eliminating the landfill methane emissions from individual food waste is equivalent to a 13% reduction in individual vehicle fuel use or a 16% reduction in individual electricity use, processes where increased efficiency can be more challenging to attain because it is tied to basic needs[46]. And this simple calculation also ignores the large amount of food waste that occurs before the consumer level, indicating that this is a low estimate for the total impact of food waste reduction on the global greenhouse gas burden. The effects of Buy Better on the food distribution and production systems will be extremely complicated in reality, but if we assume that a decrease in demand will decrease food production, then there will also be upstream energy savings (particularly of water) from food producers. However, it's not at all clear that this assumption is warranted, given how far food production currently outstrips consumer demand. On a related note, it's not immediately obvious that Buy Better would have any particular effect on food distribution: indeed, increasingly picky buyers might exacerbate waste in the food distribution system as retailers attempt to display and offer only the very best-looking produce to consumers aiming to buy only what they will use. Ideally, buying better would involve both more efficient purchasing and less picky purchasing, but these two goals might make uneasy companions. [47]

So where does Buy Better stand? The 2.5% of the individual carbon footprint represented by the landfill emissions from current rates of food waste is a small fraction, particularly when

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[44] Jones, C. M., and D. M. Kammen. Quantifying carbon footprint reduction opportunities for U.S. households and communities. Environmental Science & Technology 45(9): 4088-4095, (2011).

[45] Ibid.

[46] Ibid.

[47] For an overview of some efforts along these lines, see "How 'Ugly' Fruits and Vegetables Can Help Solve World Hunger," *National Geographic:* http://www.nationalgeographic.com/magazine/2016/03/global-food-waste-statistics/, 2/25/16.

considering that the total elimination of all wasted food is unreasonable. While many actions that reduce carbon emissions are laudable, changing what we buy at the market, and not necessarily the quantity of food, would likely attain a more significant improvement in an individual's carbon footprint. Food purchasing and consumption constitutes 15% of the average individual U.S. carbon footprint, accounting for both direct and indirect processes within the food system that require fossil fuel use.[48] Changing individual diets by eating less meat and fewer calories generates the largest individual cost savings per unit of carbon reduction compared to many other individual reduction initiatives (e.g., reducing flying, changing thermostat temperatures, buying efficient vehicles, using CFL light bulbs, etc.).[49] So buying better by modifying what you buy, and not just how much you buy, has the promise of being more impactful: not with respect to reducing how much food you waste as an individual, but in reducing the up-stream carbon impacts of your purchasing

The complex nature of carbon emissions, and the fact that they are embedded within essentially all products, also create important downstream consequences for what individuals buy with their savings from potential diet changes and reduced food waste. Models of consumer behavior indicate that cost savings frequently shift consumption to other goods, not necessarily creating neither an appreciable decrease in overall resource consumption nor individual carbon footprint[50]. While individuals might initially save significant financial and carbon resources through changing diet and reducing wasted food, the lasting impact of their efforts depend on how those resources are reallocated. For example, if a family of four is using their modest annual cost savings from food waste reduction to buy a new television, they might easily consume (or even exceed) the amount of greenhouse gas savings that they accrued from food waste reduction throughout the year. A single-minded focus on food waste at the individual level doesn't capture the whole picture, and a more holistic attention to behavioral changes would create a more significant and lasting impact on individual carbon emissions.

What of Distribute Better? The primary way that individuals could reduce their individual food waste in this way is by donating to those in need. This modification would ostensibly increase the supply of food available for the hungry at local food banks. However, the donation of perishables at the individual level is tricky, where a recent study showed that household donations reclaimed only 3% of wasted food[51]. Due to the frequency with which it would be necessary, donating perishables would be burdensome on individuals who need to get the food from their houses to a food bank. Moreover, if we assume that opened containers cannot be donated, it's not even clear how much perishable food that individual consumers could reasonably hope to donate. This is of course not to say that individuals might not buy extra food for the purpose of donation, but we're focusing here on how to reduce waste given extant purchasing patterns.

So it looks like promoting a modified conception of what counts as food waste, and buying better in response, might have some modest effects on our individual food waste, and some more substantial effects on our individual carbon footprints. However, in order to be effective, this shift would need to be accompanied by a range of other modifications in our purchasing and energy-use behaviors. And as noted, individual food waste comprises only a very small fraction of overall carbon emissions. Far more significant progress could be made on this score by changes in the

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[48] Ibid.

[49] Ibid.

[50] Garnett, T. Where are the best opportunities for reducing greenhouse gas emissions in the food system (including the food chain)? Food Policy 36: Supplement 1, S23. (2011).

[51] Griffin *et. al.* (2009)

production and distribution of food, changes that individuals are in a relatively weak position to influence through their purchasing behavior alone.

Thus, when it comes to emissions, it's not clear that a focus on shifting norms surrounding individual food-waste behavior will yield results that will make a significant contribution towards affecting the substantial problems caused by waste in the food system. To be clear, there is absolutely nothing wrong with setting individual goals to reduce food waste, and it looks like widespread adoption of more efficient waste-norms would have some modest positive results. However, it is important to remember that individuals have a limited capacity to adopt behavioral changes in their everyday lives, both because of restrictions on time, resources, and energy, and because of the cognitive load involved in doing so. Moreover, adopting certain small goals can lead to the self-licensing of other problematic behaviors.[52] To that end, we need to think very carefully about what norms and virtues we want to devote time and resources to promoting. The extent of problems in the agricultural production and distribution systems relative to the benefits of widespread changes in individual food waste norms suggests that a more productive focus might be the promotion of virtues of civic engagement surrounding food and other environmental issues. Institutional changes have the potential for far greater improvements in the food and agriculture system, and individuals have a role to play in influencing those changes through activism and lobbying of their elected representatives. For instance, France has recently made it illegal for supermarkets to throw out edible food.[53] It is difficult to imagine a governmental response to food waste of this sort in the U.S. without significant grassroots support. Moreover, promoting virtues of civic engagement has the potential for crossover effects surrounding other moral and political issues in contrast with the narrow scope of modifying individual food waste behavior.

Laws requiring food producers and distributors to donate more food also have the potential to make more significant contributions to combatting hunger than the donation of food by private individuals (as discussed above). Indeed, though there is surely an important relationship between food waste and hunger, the rhetoric surrounding this relationship at the individual level can be misleading. For instance, a recent *National Geographic* article on food waste and world hunger notes: "Some U.S. schools, where children dump up to 40 percent of their lunches into the trash, are setting up sharing tables, letting students serve themselves portions they know they'll eat, allotting more time for lunch, and scheduling it after recess—all proven methods of boosting consumption."[54] For one, this approach to food waste plays into some of the same worries about waste norms discussed above: it's not obvious that "boosting consumption" is a noble approach to eliminating food waste, especially considering the epidemic of childhood obesity in the U.S. Moreover, though, school children throwing out a smaller percentage of their lunches have a tenuous connection with the alleviation of hunger. Food waste and world hunger are often mentioned in the same breath, and while this may play an important role in educating people about these broad problems and their relationship, we should be wary of implying that individual reduction of food waste is going to make significant strides towards eliminating hunger.

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[52] See, for instance, Anna C. Merritt, Daniel A. Effron, and Benoît Monin, "Moral Self-Licensing: When Being Good Frees Us to Be Bad," *Social and Personality Psychology Compass* 4(5) (2010), pp. 344-357; Ayelet Fishbach and Ravi Dhar, "Goals as Excuses or Guides: The Liberating Effect of Perceived Goal Progress on Choice," *Journal of Consumer Research* 32(3) (December 2005), pp. 370-377

[53] https://www.washingtonpost.com/news/wonk/wp/2015/05/22/france-is-making-it-illegal-for-supermarkets-to-throw-away-edible-food/

[54] "How 'Ugly' Fruits and Vegetables Can Help Solve World Hunger," *National Geographic:* http://www.nationalgeographic.com/magazine/2016/03/global-food-waste-statistics/, 2/25/16.

The importance of institutional change when it comes to combatting hunger is not only about the more substantial contributions that food producers and distributors can make to food banks. Rather, it is about alleviating the pressure on food banks as an adequate solution to the problem of hunger in the first place. For instance, Mark Winne offers a critical appraisal of the relationship between food banks and food producers/distributors, arguing that what should be an emergency network for the hungry has come to function primarily as a mechanism for managing waste from a broken food system without making any substantial changes to that system. Summing up, he writes: "All of this means that we must confront policymakers with the reality of food insecurity and hunger in North America and not let them use the private network of emergency food providers as an excuse to withhold adequate public funding to get the job done. Surely this would be better than expending the countless resources we do now to mobilize the thousands of people who are needed to manage the surplus food that our food system giveth and just as easily taketh away."[55] Addressing food insecurity must ultimately be about providing accessible and affordable food that people can acquire, as Winne puts it "through *normal channels*."[56] Perhaps the innovation of stores like Daily Table (founded by Doug Rauch, formerly of Trader Joe's) which sells surplus food from other vendors at discount prices might be part of an approach that unites concerns about hunger and food waste in a sustainable fashion.[57]

5. Conclusion

This discussion suggests that the problem of food waste is more of a political and institutional problem than one of individual moral responsibility. This conclusion should have an effect both on what we do about food waste and how we talk about it. Current food waste rhetoric that focuses on individual consumer behavior has the potential to be a "double diversion," misleading at best, because it obscures the disproportionality larger role played by institutions in causing food waste problems, and pernicious at worst if this prevents us from effectively addressing the problem.[58] This, of course, does not mean that individuals do not have a role to play in addressing that problem, but it suggests that discharging our moral duty with respect to reducing food waste will be largely a matter of political advocacy and activism rather than a matter of making substantial changes to our individual food behaviors. By all means, we should make reasonable efforts to not overbuy food and to avoid being overly picky about our produce. But these efforts should not lead us to neglect our responsibility to fight for systematic changes that have a much greater potential to solve the problem of food waste.[59]

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[55] Mark Winne, "Waste not, want not?" *Agriculture and Human Values* (2005) 22: 203-205.

[56] Ibid, 205. For a recent discussion of the relationship between food banks and food security, see Domenic Vitiello, et al. "From commodity surplus to food justice: food banks and local agriculture in the United States," *Agriculture and Human Values* (2015) 32: 419-430.

[57] http://dailytable.org/about-us/our-story/, 3/31/16

[58] See William R. Freudenburg, "Environmental Degradation, Disproportionality, and the Double Diversion: Reaching Out, Reaching Ahead, and Reaching Beyond," *Rural Sociology* 71 (1), 2006, pp. 3-32. Thanks to Chris Schlottman for making this connection.

[59] Thanks to audience members at the 2016 UVM Food Ethics Workshop for helpful feedback on this paper. Thanks, in particular, to Tyler Doggett for thoughtful written comments.