

Food Today

with Pat Bennett, "Turning Stones into Bread: Developing Synergistic Science/Religion Approaches to the World Food Crisis"; Varadaraja V. Raman, "Food: Its Many Aspects in Science, Religion, and Culture"; A. Whitney Sanford, "Why We Need Religion to Solve the World Food Crisis"; and Steven M. Finn, "Valuing Our Food: Minimizing Waste and Optimizing Resources."

VALUING OUR FOOD: MINIMIZING WASTE AND OPTIMIZING RESOURCES

by Steven M. Finn

Abstract. The magnitude of the global food waste problem is staggering, yet it receives little mainstream attention. We waste nearly half of all food produced—more than one billion tons annually—yet nearly one billion global citizens are hungry. Our values are out of balance; we need to properly value our food. Urgent change is needed, beginning with heightened awareness and a sense of responsibility to people and planet.

Feeding nine billion people by 2050 is a tremendous challenge, but also a tremendous *opportunity* to develop new levels of innovation and collaboration to eradicate hunger, improve the environment for future generations, and create a more unified, secure world.

A new, durable, multifaceted approach to reducing food waste is needed in the form of a global network. This global network should be anchored by a sense of shared responsibility among consumers, businesses, governments, and global institutions to optimize resources in the quest to provide for nine billion people by 2050.

Keywords: environment; global food waste; hunger; opportunity; optimizing resources; partnerships; sustainability

SCOPE

There is no shortage of alarming statistics on the problem of global food waste today. A study by the Stockholm International Water Institute, for example, noted that food losses and wastage between field and fork may be as much as 50% (Lundqvist, de Fraiture, and Molden 2008, 4). A study

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by the Food and Agricultural Organization of the United Nations (FAO) noted that about one-third of all edible parts of food produced globally for human consumption (about 1.3 billion tons) goes to waste annually (Gustavsson et al. 2011, 4).

In U.S. dollars, FAO estimates that food losses and food waste total about \$680 billion per year in industrialized countries and \$310 billion in developing countries (FAO 2013a, 1). Combined, that is essentially one *trillion* dollars in food losses annually. Viewed by type, global food losses and waste per year total 30% for cereals, 40%–50% for root crops, fruits, and vegetables, 20% for oil seeds, meat, and dairy products, and 30% for fish (FAO 2013a, 1).

In the United States, a 1977 study estimated that 20% of the food produced for human consumption was lost annually. At the time, this amounted to 137 million tons valued at \$31 billion (USDA 1977, 9). Two decades later, another study estimated U.S. annual food losses in 1995 at 96 billion pounds (43.5 billion kg)—or 27% of the food available for human consumption (Kantor et al. 1997, 3). More recently, The Natural Resources Defense Council noted that 40% of the food in the United States is not eaten, which translates to 20 lbs (or nine kg) of food per person per month and a value of \$165 billion (Gunders 2012, 4).

Although the United States has advanced in many ways since 1977, we have regressed in terms of food waste. Jonathan Bloom made the concept of food waste a bit more tangible to many in noting that each day the United States wastes enough food to fill the Rose Bowl in California (Bloom 2010, 1). While that stunning visual has sparked some additional awareness and much needed dialogue, clearly we have much work to do in terms of reducing food waste and optimizing our use of critical resources.

The United Kingdom shows alarming rates of food waste as well. A 2008 study revealed that U.K. households waste 6.7 million tons of food per year—about 33% of purchases. More than 60% of that food “could have been eaten if managed better,” and nearly 25% of all avoidable food waste was thrown away in a whole or unopened state (WRAP 2008, 4).

Food losses and waste occur for numerous reasons and at all stages of growth, distribution, and consumption. Extreme weather conditions and pests can lead to losses prior to harvest, while regulations and overly selective quality standards on size and shape (linked to consumers’ demand for perfect produce) can lead to significant waste at harvest. Additional waste occurs from machinery, during transport and storage, and throughout food preparation and conversion. Further downstream, waste occurs due to supply/demand variability, damaged packaging, overpurchasing and plate waste, and “sell-by” date regulations (Kantor et al. 1997, 3–8). Consumers are largely indifferent to food waste and many do not make the effort to manage it aggressively; wasting food is too easily accepted as a natural consequence of modern lifestyles. Others are simply unaware of their level

of food waste and thus avoid the discomfort of considering it further. Such behavior is costly; an average American family of four discards 25% of its food totaling over \$2,200 per year (Bloom 2010, 187).

Interestingly, FAO notes that food losses in developed countries are roughly the same as in developing countries—although there is a difference in *where* all of that waste occurs. More than 40% of food losses in developing countries occur at postharvest and processing levels, while conversely more than 40% of food losses in developed countries occur at the retail and consumer levels (Gustavsson et al. 2011, 5). Lack of infrastructure is a significant problem in developing countries; material often perishes in transit to market or rots in inadequate storage facilities. In the technologically advanced industrialized nations, highly efficient transportation systems allow for rapid movement of material over great distances. Convenience-focused consumers expect fully stocked shelves at all times, and they expect “perfect” produce. Both expectations result in excessive waste. Retailers do not want to risk alienating customers with sparse-looking shelves, so they knowingly order more than they will sell. Similarly, consumers want produce items that are uniform—items that are too small, too big, or misshapen will not be selected and will therefore not be displayed on store shelves. In fact, vast amounts of such items—though nutritious and perfectly edible—will be isolated from the start and will not even make the journey to supermarkets due to our culture of abundance.

In developing countries, infrastructure and technology constraints lead to high waste between producer and market. Once the food gets to market, however, little goes to waste because food is simply considered too valuable. In industrialized nations, where food is undervalued, the reverse occurs. Highly efficient infrastructure allows food to get to market in excellent condition with much remaining life. Once there, however, excessive supply coupled with perfection-seeking consumers leads to substantial waste, which all too often goes to a landfill. Food waste in developing nations results from lack of infrastructure; food waste in industrialized nations stems largely from a culture of abundance and apathy.

When considering such dire facts in conjunction with statistics on poverty, hunger, environmental degradation, and climate change, one wonders why the United States and other industrialized nations have not made more progress on minimizing food waste to date. Vaclav Smil agrees, noting that the prevalence and extent of waste throughout the food system are “astonishing” and that “its perpetuation is among the most offensive demonstrations of human irrationality, and its reduction would obviously go a long way toward improving the productivity of the modern food system while reducing its environmental impacts” (Smil 2004, 18). Despite the alarming statistics and the callous waste of resources, however, food waste has not yet become a mainstream issue in the United States.

SIGNIFICANCE

Although below the radar of most Americans, the significance of the global food waste problem is extreme, and it has direct bearing on the two most pressing issues of our time—poverty/hunger and the environment.

A review of hunger-related data raises the question of how we can possibly waste so much food. FAO's 2012 report on global food insecurity noted that 870 million people (12.5% of the global population) were undernourished from 2010 to 2012, with about 98% of those individuals living in developing countries (FAO, WFP, and IFAD 2012, 8). The most recent update puts the number of global undernourished at 868 million, with an estimated 2 billion individuals facing one or more micronutrient deficiencies (FAO 2013b, 3).

In the United States, the most prosperous nation on the planet, hunger figures continue to climb as we waste billions of pounds of food annually. More than 50 million Americans—roughly one in six—lived in food insecure households in 2011. Roughly 17 million of these individuals were children, and about 5 million were seniors (Feeding America 2013). In addition, a recent study of thirty-five economically advanced countries ranked the United States— at 23.1%—second to last in terms of the percentage of children living in relative poverty (UNICEF 2012, 3).

Wasted food prevents needed calories from reaching the mouths of the needy. A trip to the back of almost any supermarket will reveal large quantities of bread and other bakery items piled in dumpsters. Worse, it is easy to find discarded fruit, vegetables, chicken, meat, and numerous items from fresh food bars. A study of supermarket retailers showed that annual losses in 2005 and 2006 for three key food groups averaged as follows: 11.4% for fresh fruit, 9.7% for fresh vegetables, and 4.5% for fresh meat, poultry, and seafood (Buzby et al. 2009, iii). These are high-quality calories going to the waste stream rather than to individuals lacking nutritious food. Fruits, vegetables, and quality proteins are desperately needed among the food insecure to combat growing obesity rates. Note that these figures do not include the waste that occurred upstream as “imperfect” items—also with high nutrition content—were discarded after being deemed unsuitable for market.

Beyond the missed opportunity to redistribute wasted food to help feed people, or even animals, food waste significantly impacts the environment in terms of resource consumption and pollution. Producing food that ends up going to waste increases deforestation; we are needlessly taking land out of its natural state. One study noted that the production of meat and dairy products wasted annually in the United States and the United Kingdom alone required 8.3 million hectares (one hectare is about 2.5 acres) (FAO 2012, 2). This equates to an area about two-thirds the size of the state of New York. The continued press for land to grow food has the potential to

disrupt climate, hydrological cycles, and soils and threatens to reduce the productivity of agricultural land by 25% this century—thus “undermining humanity’s ability to grow enough food at all” (Stuart 2009, xv).

Food waste means wasted water—our most precious resource. Since agriculture is the largest consumer of water, the scale of food waste translates to excessive water waste. More than one-quarter of annual freshwater use is attributed to wasted food (Hall et al. 2009, 2). Significantly, the loss of water associated with food waste could “easily meet the household water needs of the nine billion people expected in 2050” (FAO 2012, 2).

Food waste pollutes the air and contributes to global warming. The energy required to produce the food that goes to waste annually in the United States translates to 300 million barrels of oil (FAO 2012, 2). We expend additional resources to haul that waste away for disposal. A large percentage of food waste ends up in landfills, where it decays and produces methane gas—a gas which has 25 times more global warming potential than carbon dioxide (Hall et al. 2009, 2). Decomposing food also contributes to groundwater pollution.

Agricultural institutions use large quantities of fertilizer to produce food, along with large quantities of pesticides. These inputs are not only wasted when we discard excess food, but they also contribute to water pollution via runoff.

Given these shortcomings, our food system can be viewed as a dysfunctional circle of immense proportion. We produce vast amounts of food, harvest some (not all), pick out less than perfect items, distribute the remainder to markets, store it, stage it for sale, discard it as it ages, and eventually haul away the discards to landfills. At the end of the process, we have utilized vast amounts of labor and consumed a substantial amount of finite resources only to discard nearly half of what we initially produced—and further pollute the environment in the process. It is useful to think of this process at the individual level. How many of us would work all day to produce ten widgets knowing that at the end of the day we would throw away five, incur additional costs to dispose of those five, and further harm the environment in the disposal process?

There is a moral issue here as well. All individuals on the planet have the basic right to an adequate standard of living—and food and adequate nutrition are rooted in that right. Yet we discard immense quantities of food annually that could be utilized by the needy to attain that adequate standard of living. Indeed, the Ample Harvest organization notes that in the United States we discard over 100 billion pounds (45.3 billion kg) of food annually—enough food to completely eliminate hunger (www.ampleharvest.org 2013). Similarly, FAO notes that eliminating one-fourth of current food loss and wastage would be enough to feed the 870 million that are experiencing hunger today (FAO 2013a, 2). On moral grounds alone, food waste reduction should be a global priority. Looking

forward, we face the challenge of providing adequate nutrition for another two billion people in less than forty years. A recent study by the World Resources Institute suggests that halving current rates of food loss and waste would cover 22% of the caloric gap between food that is available today and food that is needed in 2050 (Lipinski et al. 2013, 2). Clearly, we have a moral obligation to better utilize excess food resources.

TIME FOR GLOBAL (NETWORKED) CHANGE

Thus, to recap, we are wasting over a billion tons of food across the globe annually. That waste exacerbates the hunger problem (and perpetuates the gap between the haves and the have-nots), contributes to health problems and obesity by keeping nutritious food from reaching the needy, and harms the environment by unnecessarily consuming land for agricultural purposes, wasting water, increasing greenhouse gas emissions, increasing use of fertilizers and pesticides, increasing landfill use, and increasing water pollution through runoff. In all of these ways, food waste perpetuates instability in the world.

The lack of mainstream attention given to food waste—and the lack of a sustained and unified global effort to reduce it to date—suggests a lack of understanding of the potential social, economic, and environmental benefits of such reduction. Increased awareness of the scale of the global food waste problem is needed among consumers, businesses, and government leaders; more involvement and tangible action is needed from them to reduce food waste as part of a broad, durable, collaborative global resource optimization strategy to prepare the world for nine billion people by 2050.

It is clear that we need change to drive global reductions in food waste. In fact, one of the challenges of this discussion is overcoming what seems so painfully obvious: Who wouldn't want to feed people versus landfills? Who wouldn't want to help the environment rather than hurt it? Who wouldn't want to optimize resources instead of squandering them? Part of the reason for slow progress on reducing food waste is lack of awareness. Not enough people understand the scope of the problem, nor have they considered these simple questions. Some do not foresee any threat to our current culture of abundance. Others may have shied away from experimenting with food donation programs due to concerns over communication, logistics, reliability, and potential liability (Finn 2012, 44–47). Still others are as yet unwilling to move away from an economic model which excludes the costs associated with environmental externalities. For many, sending food waste to the landfill is simply too easy and has not yet become cost-prohibitive.

Food waste has not yet become a mainstream issue in the United States. Not only must it be added to the national agenda, but it must be a global priority as well as part of planning for nine billion people by 2050. Ten

years ago, Jean-Francois Rischard pointed out twenty global problems in need of urgent solutions (i.e., within twenty years) and cited the need for a more “intelligent alliance” between public, private, and civil sectors. It is important to note that several of the problems—global warming, biodiversity and ecosystem loss, fisheries depletion, deforestation, water deficits, and maritime pollution—are closely tied to the problem of global food waste. Rischard called for a “networked governance” approach to these problems, with knowledge-based teams forming transparent, collaborative, global networks that appeal to universal values and “seek to resolve global problems in the spirit of global citizenship.” In addition to problem solving, these teams would establish norms for national governments to follow, and develop a system to rate their adherence (Rischard 2003, 81–83).

In essence, Rischard called for a new form of public-private partnerships at the global level to tackle the world’s most pressing problems with speed and efficiency. Ten years later, his approach is highly appropriate for the topic of global food waste and would be a sound way to quickly advance food waste reduction efforts. A global initiative to reduce food waste appeals to universal values, and it requires a spirit of global citizenship that harnesses the expertise of key individuals while fostering deep, effective public-private partnerships. At a high level, surely we can all agree on the benefit of attacking this sustainability challenge which is so central to many aspects of the 9 billion by 2050 problem?

In discussing the end of poverty, Muhammad Yunus notes that “a great crisis offers great opportunity” (Yunus 2010, 199). Because it is so intertwined with the dual problems of hunger and the environment, the problem of global food waste is one which offers a colossal opportunity for the world—and a global network devoted to reducing food waste should focus on that opportunity. Such an effort not only involves working to reduce food waste and optimize resource consumption to feed people and reduce environmental damage, but it also creates a sense of global community. It unites nations around a problem which concerns everyone, while also inspiring individuals and business, promoting partnerships, and bridging gaps between nations.

A FOCUS ON OPPORTUNITIES

The overriding opportunity presented by the problem of global food waste can be viewed in several pieces, ten of which are listed below.

- (1) *The opportunity to expand national/global awareness and education on food waste*

Raising awareness is critical to driving meaningful change regarding food waste. Food waste must become a mainstream topic—especially in industrialized nations—but in developing countries as well.

When made aware of the staggering amounts of food waste, most people are eager to make changes in their individual behavior. There is a certain suppressed discomfort regarding food waste; at a deep level most people realize that food is valuable and should not be so easily squandered—but our fast-paced lifestyles do not allow us to stop for deeper reflection.

Most individuals in industrialized nations like the United States and the United Kingdom are blessed with a culture of abundance. Food is relatively cheap—and plentiful—and that plentiful nature is reinforced with every trip to attractive, fully stocked supermarkets. That abundance comes at a high cost, however, in terms of resource consumption and sheer waste. And because resources are finite, that abundance is a myth—it cannot last forever. In fact, there are already alarming signs throughout the food system regarding scarcity—particularly in terms of seafood—and the addition of millions of new middle class consumers in the coming decades will only put further strain on food and water resources.

Of paramount importance is the need to change the culture of abundance in industrialized nations, creating recognition of the value of food and the value of the resources used to produce it and bring it to our tables. This involves consideration of the value of food to those who are food insecure.

Hand in hand with increased awareness is the need for education. We need to inform individuals at an early age of the importance of respecting food and reducing food waste. We are inundated with too many signals that it is acceptable to waste food: all-you-can-eat meals, two-for-one deals, commercials showing fresh produce being destroyed with joy, and “advergames” which convey an abundance of food to children (Harris 2013, 111). Also, we need an intensive change campaign directed at consumers. Meaningful change starts with the consumer, who then impacts producers, businesses, and markets. Consumers need to reward companies that embrace sustainability principles related to food; their choices at check-out are critical to driving change.

We need a new compact between the consumer and the food industry—one in which consumers are more tolerant of shelves that aren’t stocked to full capacity right up until closing time with excessive varieties of items like bread and rolls—and one in which consumers are less fixated on perfection and size (given that the fruit or vegetable in question will taste the same regardless of size and shape). Such a change will allow retailers to avoid culling out millions and millions of pounds (or kg) of “imperfect” produce annually.

FAO’s Global Initiative on Food Losses and Waste Reduction—SAVE FOOD—is a recent food waste reduction initiative which rests on four pillars: awareness raising; collaboration and coordination; policy, strategy, and program development; and support to investment programs and projects implemented by private and public sectors (FAO 2013c). The

SAVE FOOD initiative is a nice start; a global network of the type discussed here can and should go further with urgency.

(2) *The opportunity to make inroads toward mitigating hunger*

Food waste and hunger are clearly linked. When nearly one billion people are hungry—and simultaneously more than one billion tons of food are going to waste across the globe annually—we have a serious disconnect that cries out for change. This disconnect requires short-term and long-term action. In the short term, it requires capturing and redistributing high-quality calories to meet the nutritional needs of hungry people. In the long term, it requires a global commitment to eliminating poverty—and that is a question of global will.

It is time to resolve the hunger problem for the long term—and what better place to start than by reducing the vast amount of perfectly healthy food that we discard every day as part of the existing global food system? The nine billion by 2050 problem provides the needed urgency, and it should serve as the tipping point toward a global network approach toward eliminating hunger. Driving that process will lead to innovations that will spur sustainability gains in other sectors along the way.

(3) *The opportunity to make significant contributions to the environment*

A recent McKinsey report noted that the world might be entering a period of high and volatile prices for resources. Some of the reasons cited include the addition of up to three billion middle-class consumers in the next twenty years, rising demand for resources while new sources of supply are becoming more challenging, the fact that resources are increasingly linked, and the fact that environmental factors (increased soil erosion, declining groundwater reserves, ocean acidification, declining fish stocks, and so on) constrain production. The report also noted that growing concern about inequality among those lacking food, water, and energy resources might require action (Dobbs et al. 2011, 4–7).

A world in which nearly one billion people lack access to adequate food and water is not a secure world, but is a world ripe for social unrest and upheaval. Extensive food waste in both industrialized and developing countries contributes to this problem. As the Institution of Mechanical Engineers notes, “the potential to provide 60–100% more food by simply eliminating losses, while simultaneously freeing up land, energy, and water resources for other uses, is an opportunity that should not be ignored” (Fox 2013, 5).

Also regarding the environment, the Natural Step has developed a table of four sustainability conditions that must be met “to maintain the essential natural resources, structures and functions” that serve to sustain society. The first three are (1) the systematic increase of concentrations of

substances extracted from the Earth's crust, (2) the systematic increase of concentrations of substances produced by society, and (3) the systematic physical degradation of nature and natural processes (Stuart 2012). It is worth noting that food waste—which involves massive consumption of fossil fuels, involves pesticide and fertilizer use, and which degrades nature by promoting deforestation—violates all three conditions.

Food waste provides a serious drain on resources—those used in production and those used to haul the waste away—while also contributing to land, water, and air pollution. Any successful effort to reduce it would be beneficial from an environmental and resource optimization standpoint.

(4) *The opportunity to make inroads on obesity and health*

Walk through any major city in the United States and observe the people. Actually, just look around in your local travels. Unlike hunger, the obesity epidemic is highly visible. The Centers for Disease Control reports a number of alarming statistics regarding obesity, including the fact that more than one-third of Americans (35%) are obese (www.cdc.gov 2013b). In addition, roughly 17% of children and adolescents ages 2–19 (12.5 million) are obese. These rates have been rising sharply. In the past thirty years, obesity rates have more than doubled in children and tripled in adolescents (www.cdc.gov 2013a).

Obesity stems from poor nutrition, and the long-term health care problems (and costs) that ensue are staggering. Food deserts are a significant part of this problem—areas where there are insufficient choices of fresh produce items available for residents. Waste of high-quality calories (fruits and vegetables, meat, dairy, and so on) in affluent areas prevents access to such calories by low-income individuals who desperately need them. Efforts to efficiently capture and redistribute produce and proteins that would otherwise be discarded are needed. Education is also imperative here, both to influence individuals at an early age about the importance of healthy eating and to spur potential donors (growers and food retailers) to donate healthy foods rather than discarding them.

(5) *The opportunity to build “community” on a much greater level*

Corporate social responsibility efforts often involve building deeper relationships within the local community in which the organization resides. Addressing the problem of food waste with the above-mentioned capacity and urgency provides the opportunity to bring *nations* together in a *global* effort to solve critical challenges related to hunger and the environment.

The global network addressing food waste can benefit from the work of George Kent. Kent argues that the hunger problem has not yet been solved because the world has not cared enough to solve it. He notes that the hunger problem must be “transcended” via the creation of new

institutional arrangements that do not generate new hunger, and that a new approach should involve “human rights, local self-reliance, appropriate planning, and strong communities” (Kent 2011, x–xiii). He argues that strong communities are those in which individuals have a high level of concern for one another’s well-being (Kent 2011, 25). Attacking food waste is central to feeding nine billion by 2050 in a sustainable manner. The effort must involve unprecedented global collaboration—since the fate of the planet relies on solving food security and environmental issues—and must therefore involve the creation of a strong global community. Such change will ultimately contribute to greater global security.

(6) *The opportunity to develop innovative partnerships on food waste and share success*

The world produces enough food to feed the global population today. However, redistribution of excess food to combat hunger is not an easy fix, and the food “is not where it needs to be” (Parker 2011, 3). This is evidenced by the fact that nearly 900 million people are hungry worldwide.

Opportunities for meaningful partnerships to reduce food waste abound. At the local level, many caring and motivated individuals dedicate their own time to pick up excess food from neighbors, farmers, and/or stores and then transport that material to charitable food organizations, where it can be put to good use. Many small nonprofit groups are dedicated to picking up excess food for local pantries through established relationships. Organizations like the Food Recovery Network in Maryland began with a simple concept: college dining halls have excess food every day, and a small amount of timely labor can transport that food to nearby pantries on a daily basis. Feeding the 5000, founded by Tristram Stuart, promotes awareness of the problem of global food waste by organizing events in major cities in which thousands are fed delicious meals with food that would have otherwise been discarded. Food banks establish relationships with corporate donors, particularly those in the food sector, to ensure a reliable supply of food for their constituents.

A challenge in the current landscape is to efficiently capture high-quality food—such as fresh produce and meat—and distribute that food to the needy. Liability concerns limit donations, and perishability makes for a short time window in which food banks can distribute the material. Some food organizations fear perceived complexity in donation arrangements and simply continue to discard food as it approaches expiration dates. Confusion over date labels results in vast amounts of food being discarded that could otherwise be utilized.

Still, there are significant opportunities to capture highly nutritious food at multiple stages of the food chain. Food agencies can create productive relationships with agricultural colleges and nearby growers. Larger

organizations with significant infrastructure can capture sizeable quantities of imperfect (nonmarket grade) produce at harvest time. Other groups can focus solely on awareness and educational efforts to promote relationships.

Significant benefits accrue to donors who partner with charitable food organizations in the form of tax deductions, reduced trash disposal costs, improved employee morale, and enhanced reputation in the community. Such partnerships also benefit the donor organization by prompting the search for more productive operational changes and can help enable an environment for implementation of sustainability initiatives. Increased visibility of such benefits as part of a national (and global) awareness campaign would undoubtedly generate more partnerships. A case in point as noted by ResponsEcology's Matt Walls: of the more than 6 million firms in the United States with a payroll, only 209 are currently signed on as members of the EPA's Food Recovery Challenge. Increased awareness of the benefits of partnerships is clearly needed.

A global network addressing food waste should be tasked with promoting partnerships to reduce food losses with stakeholders at local, state, national, and global levels. This will involve promoting collaboration on a grand scale to minimize food losses and redirect excess food for optimal use.

(7) *The opportunity to harness the power of business*

A global network on food waste has the opportunity to harness the power of business at a time when corporate social responsibility appears to be gaining more traction as innovation becomes more intertwined with sustainability.

Business organizations, especially multinationals in the food sector, are in a unique position to lead implementation of sustainability initiatives which utilize resources efficiently and minimize environmental impact. Anders Dahlvig, former CEO of IKEA, recognizes the importance of business contributing to a better society for several reasons: companies are better equipped than any other institutions to actually help people's lives; they can provide larger meaning for their employees; they will likely earn more profits if they live up to a social ambition; and they will be more competitive in the labor market by doing good. Significantly, Dahlvig also notes that companies "have the capacity to reduce poverty, improve the environment, and increase the standard of living for most people" (Dahlvig 2012, 9).

Innovating for sustainability is crucial for the survival of business, and solving the global food waste problem along with the nine billion by 2050 problem provides tremendous opportunities for business. Solving these problems will require vision of a hunger-free, minimal-food-waste world, and companies will have to think and operate differently to contribute to these goals. They will need to reframe for sustainability—overcoming fear of change, embracing sustainability as competitive advantage, and

creating an enabling environment such that sustainability lies at the core of operations. Organizations that reframe in this manner are the ones that can be harnessed by the global network to drive efforts to solve the food waste problem.

Innovating for sustainability is about purpose, and about thinking differently. It is also essential; we no longer have the option of leaving hunger and environmental challenges to the next generation.

- (8) *The opportunity to see the benefits of, and move toward, a new economic system*

Many of the environmental problems we face today stem from the fact that our current economic model has not assigned the full costs associated with production and disposal (air pollution, water pollution, landfill space usage) to for-profit firms. As a result, environmental externalities have long been ignored. If food retailers faced a higher cost to dispose of excess food to the landfill, they would either stock less or engage in other efforts (conversion, donation, and so on) to reduce the amount of food discarded. Producers would take similar actions, such as donating excess food for human consumption, utilizing the excess for animal feed or industrial use (such as a waste-to-energy operation), or composting for fertilizer.

We need to move away from the “take-make-waste” model (or produce, sell, use, and discard) to a regenerative economic model—a model which draws on lessons from nature—where byproducts (outputs) from one phase become nutrients (inputs) to another process (Senge, Carstedt, and Porter 2001, 28). Scharmer notes that we need to move toward Capitalism 3.0, a collaborative economic system in which *ego*-system awareness is replaced by *eco*-system awareness—where an individual perceives a problem from *all* of the perspectives in a given socio-ecological situation and not just from his or her own (Scharmer 2009, 5–6).

Solving the problem of global food waste, and creating a sustainable world which can provide for the needs of nine billion people, is going to require new thinking, massive collaboration, and very likely a global transformation to a new economic paradigm. In such a world, the environmental externalities of food production can no longer be ignored.

- (9) *The opportunity to experiment with scaling up; coordinating large national/global projects*

Every four years the world comes together in spectacular fashion to put on the Olympic Games. It is a way to promote international harmony and mutual understanding through sports; a goal that most would agree is a worthy one. Tremendous logistical and financial investments are made that require urgent collaboration across continents, and several countries lobby extremely hard for the opportunity to host the Games. In the aftermath,

the host country usually receives tremendous accolades for successfully managing the event.

This begs the question: why not channel human expertise and financial investment into a global network dedicated to resolving the global food waste problem? As with the Olympic Games, collaboration with multiple stakeholders is needed, urgency is required, and a global leadership team is needed to coordinate success. In the case of food waste, however, the stakes are much more serious, and the investments will be far more extensive.

McKinsey identified 130 resource productivity initiatives and prioritized them according to areas of opportunity. The top 15 accounted for 75% of the potential resource productivity gains; of those, food waste ranked third (Dobbs et al. 2011, 12). The opportunity is there. Coordinating national change efforts in industrialized nations to reduce food waste at all levels of the food supply chain—and creating a new compact between consumers and supermarkets—is a worthy effort. Advertising campaigns warrant development—both at the national level for countries like the United States as well as additional campaigns of a global nature. With extremely high unemployment, New Deal-type programs could serve to put people to work gleaning fields or harvesting orchards for food recovery organizations—thus reducing waste, feeding the hungry, minimizing environmental harm, and providing dignified work. Legislation could be developed to incent food recovery efforts and increase the cost of organic material going to landfill. In developing nations, massive infrastructure investments to reduce food losses in storage and transportation require coordination, along with knowledge transfer.

(10) *The opportunity to change the world for the better*

Last, the opportunity to minimize global food waste has significant positive implications for ending hunger and enabling food security for a planet of nine billion people.

It is an opportunity to unleash global creative capacity on a pressing problem that impacts everyone. It requires the establishment of a global network of experts with shared purpose and a shared sense of urgency.

It will require new levels of innovation and collaboration and a durable, multifaceted approach led by a global network of experts with shared purpose. This effort has the potential to bring nations of the world closer together.

CONCLUSION

The enormous magnitude of the global food waste problem has resulted in serious social and environmental problems—problems that are intertwined with the critical issue of feeding nine billion people by 2050.

Globally, we discard over one billion tons of food annually, while nearly a billion individuals remain hungry. In developing countries, vast amounts of food are lost due to poor storage and infrastructure. In industrialized nations, consumers operate amid a culture of abundance and relatively inexpensive food. As a result, a vast amount of nutritious food—food that could go to feeding the hungry—is discarded for numerous minor imperfections related to size and shape. Much of the world's food waste goes to landfills, where it consumes space as it decays and further pollutes our air and water. It also consumes additional scarce resources on the journey.

A serious disconnect exists. Our values are out of balance. We have lost touch with the value of our food—to the detriment of people and planet. The current state of waste, pollution, and hunger is unsustainable.

By 2050, the world's scarce resources will be impacted by another two billion people, many of whom will have increased purchasing power. We cannot afford to waste 30%–50% of our food, nor can we afford the environmental impact of that waste.

Urgent change is needed to reduce food waste around the globe. This change should be viewed as a great opportunity to unite the world and positively contribute to feeding nine billion people by 2050. A new, durable, global network is needed to attack the social and environmental problems caused by global food waste. This global network must have tremendous expertise, it must be collaborative, and it must be driven by shared values—as the social and environmental problems of food waste impact everyone. This network must operate with urgency and unite consumers, businesses, and governments from around the globe in the effort to minimize food waste, optimize resources, and feed nine billion people.

Fedele Bauccio of Bon Appetit cites the importance of the *journey* to sustainability, noting that it is a continuous process that doesn't culminate at a specific destination (Bauccio 2013, 1). The effort to reduce global food waste is a key component of the larger sustainability effort to provide food to hundreds of millions, improve the environment, and create a more secure world. It is a continuous journey in which we all need to participate. We each have a responsibility to nine billion other people by 2050, and that date is fast approaching.

NOTE

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