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A Wasteful Disposition: How A Consumerist Society Can Slowly Become Zero-Waste

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A Wasteful Disposition: How A Consumerist Society Can Slowly
Become Zero-Waste

Paige Werman

Abstract

Humans have exploited planet earth's resources to generate many different forms of useless remains: solid waste, food waste, pollution, electronic waste, wastewater, hazardous and chemical waste, and nuclear radioactive waste—so many that we have disregarded the environmental principle that waste in any form is not sustainable or natural. Developed countries have habituated a lifestyle of excess—the societal concept of waste being the most detrimental to the Homo sapiens' future as a living, thriving species and the reason why we have succumbed to a climate crisis. Through a reframing of ethical philosophies, economic theories, and sustainable design, societies are capable of avoiding overproductivity and the creation of unwanted materials. I examine how entire cities can become zero-waste by utilizing the NYC Green Infrastructure Plan, The Comprehensive Solid Waste Management Plan, and PlaNYC 2030—among other reports that target the waste problem in New York City, specifically. Through a new system that eliminates municipal solid waste, installs more urban farms, utilizes more sustainable technology and design, maximizes localization, changes human diet and replaces industrial packaging materials, New Yorkers can discontinue a passive reliance on the waste industry. By identifying the many sources and types of waste production, treatment, and handling, the issue can be acknowledged and remedied on a short and long term scale. Through laws, regulations, community development, urban design plans, and grassroots movements, our society can begin to refashion its trash-producing system, think about waste differently and eventually eliminate its origin. The goal of this thesis is to elucidate a zero-waste structure of living.

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Introduction: The Consumerism Problem

We have all heard the familiar dictum: reduce, reuse, and recycle—proclaimed for the modern consumer to counteract the overuse of resources and energy; to save money and land; and to begin questioning the excessively expending mechanized way of human life. Zero-waste involves eliminating the need for landfills and incinerators (trash) and honoring the life cycles of resources so that everything is returned to our ecosystem. In order to move toward zero-waste, we must first consider what wasting less entails—that is, reducing. To reduce requires consuming less than an average human currently consumes out of a concern for environmental impact—to live sustainably. Therefore, there is a necessity to create incentive. To “sustain” means allowing natural processes to proceed at a biological pace. Our continuous exploitation of earth and its inhabitants is unnecessary; and it is how waste is created, significantly harming the quality of life. I will explore the problems by applying sustainability to a consumerist mentality. I suggest that zero-waste leads to a higher level of human satisfaction and will help significantly to decipher our environmental crisis in the short and long-term. I will evolve a comprehensive environmental philosophy that frames waste production as a fundamental violation of nature’s principles. This thesis will examine how the United States and other developed countries’ economic pursuits are responsible for our substantial role in waste production and how wasting is costing us far more than is recognized. Finally, I will assess how urban planning can promote sustainable and convenient modern living without degrading the earth’s natural capital. Wasteful use of resources is a pillar of anthropogenic environmental degradation and from an in depth interdisciplinary approach, human waste production can be better understood as to why it’s a problem on the local/individual and global/societal level.

Creating a zero waste society does not imply humans must not use anything anymore without personal immoral affliction. It simply means that the remains of everything an individual uses must be re-used in some way whether direct or indirect. Naturally, all organisms produce waste in some form, but unlike most human waste or output, it is filtered and recycled to be used by another feature of the living environment. “Zero” involves two different ways to handle waste. One: some manmade materials must be reused indefinitely (like plastics) because, on a biological scale, it takes at least 1000 years for these industrial hybrids to decompose.¹ Two: other things need to cancel out or be returned to the environment in order to maintain the balance of natural chemicals in the air, water, and soil, for example, emitting air pollution and in exchange, planting a thousand trees (replacing an excess of carbon dioxide with an excess of CO₂-consumers). The goal is not to limit everything we do—although I will discuss how our mentality of excess must be transformed in some aspects—but throughout our routines, we need to “celebrate an abundance of human creativity, culture, and productivity”.² Reducing is an important stepping stone to a zero-waste society. However, humans have evolved to become heavy consumers and degraders of our natural environment and everything we’ve imagined it to become. We revel in our intelligence and manipulation of the world we live in and the answer to our crisis of waste is inherently as complicated as we are and as convoluted as the problem has become. As a connected global society, we have grown to commend the abundance of our brilliance and diversity so reducing is not a fundamental feature of our nature—but a necessary intermediary.

¹ Ellis, Sarah, et al. “Plastic Grocery Bags: The Ecological Footprint.” *Vipirg.ca*, 8.

² Braungart, Michael & McDonough, Williams. *Cradle to Cradle: Remaking The Way We Make Things* (North Press Point, 2002), 16.

Human civilizations today operate from a linear model whereas everything else—nature, our calendar, and the universe—operates in cycles. All systems in nature have inputs, flows, and outputs. Inputs come directly from the raw environment. In terms of the average human waste system, inputs can be represented by pretty much anything: wood from a tree, oil from mineral rocks, etc. Flows represent the process in which we use these materials: paper or plastic for grocery bags, gas for a car, etc. Output is the waste we produce from using the input that ends up in places ranging from the county landfill to L.A. smog. Cyclical systems are based on an unlimited lifespan whereas linear systems ensure demise in the end. I will analyze how humans can relate to a cyclical type of system. To utilize cyclical systems, we as a human society can emerge in harmony with nature. Industrial ecology is the study of energy flows in the “network of industrial processes that extract resources from the Earth and transform those resources into commodities which can be bought and sold to meet the needs of humanity”;³ seeking to understand “emergent behavior of complex integrated human/natural systems”.⁴ One of the major issues in our age of technology and innovation is the idea of a separation between nature and society. With this outlook, there can be no integration of human systems and natural systems. I will examine existing analyses of how humans can transform our systems to mimic and connect with the cycles of nature. I will establish how the consumerist society can collectively live a more fulfilling lifestyle by changing our ideas about waste. I believe a new sentiment will enlighten readers of an adequate human place within the intricacy of space and time.

³ Wikipedia. “Industrial Ecology”.

⁴ Allenby, Brad. “The ontologies of industrial ecologies?”, 33.

Chapter 1. Exactly How Much Is Too Much?

Today, human's total resource use is unsustainable and is a major cause of environmental havoc. The "Ecological Footprint" calculates the average American as utilizing his or her daily resources in a way as if Earth had five times more resources than is actually accounted for.⁵ We are creating more than we need, using it too fast, and disposing of the downgraded remains in piles by the tons while polluting our land, water, and air in the process. Earth's vital resources depend on a cycle of regeneration. Instead of creating a process that starts in human hands and ends in the landfill, humans can approach societal activities as cycles that make useful returns to the environment to be recycled and reused at the same level of worth. Chemical cycling, As Tyler Miller and Scott Spoolman describe in *Living in the Environment*, is "the circulation of chemicals from the environment through organisms and back to the environment" and is necessary for air, water, soil, food, and life to exist on Earth.⁶ In our current scenario, it will take 1.5 years to regenerate what humanity uses in one year—or in America's case, it will take five years to regenerate what Americans use in one year.⁷ Developed countries, accounting for only 19% of the world's population, are responsible for producing 75% of the world's pollution and waste.⁸ Based on the prospects of our current economic system in America, in coming years we will be consuming more and wasting even more. Our ecological footprint is unsustainable, and if we are throwing away so many things that we obviously don't need, why can't we eliminate them from being produced in the beginning? By examining how environmental issues like waste took the backburner in political consideration throughout American history, it becomes apparent

⁵ *Global Footprint Network: Advancing the Science of Sustainability*. "Ecological Footprint."

⁶ Miller, Tyler G. and Spoolman, Scott E. *Living in the Environment*, 8.

⁷ *Global Footprint Network*. "

⁸ Miller, 12.

that the consumer ethic is responsible and that abandoning our linear model of production and supply is advantageous to all.

Organic Waste Generation. Nature is programmed to recycle waste back into the necessary ecological cycles: carbon, hydrologic, nitrogen, oxygen, and phosphorous. These natural cycles act as global reusing and recycling systems that can break down our human waste/output—but only as much as it can handle. We have successfully overloaded these cycles by producing too much, in general, and of foreign items like aluminum cans, tuber ware, or metals and minerals that are in the wrong place. This excess of waste creates problems like atmospheric carbon, nitrogen, and phosphorous overload. Overloading the earth with chemicals, though they occur naturally, has led to eutrophication, dead zones, pollution, and climate change. Ecosystems have natural checks on waste generation—their population cannot exceed their food production because they don't have the means to import resources from other countries or send their waste to the middle of the ocean. Creating waste that cannot be used ever again in the form of pollution or solid landfill waste out of all the things humans use up is the reason why we are constantly fighting against nature. Returning to a zero-waste lifestyle in our new consumerist society must combine the idea of “organic waste generation” with a new mentality on consumerism that celebrates complexity and our place within the universe.

Ecological Big Foot. Biological capacity (or biocapacity) is the ability for nature to sustain an on-going supply of renewable resources without any stage in the cycle being severely diminished enough to impede its course. An ecosystem's ability to absorb waste is a vital stage in nature's constant cyclical activity because it provides for the ecological productivity of plants, animals, and detritivores. We have a method of assessing if any part of nature's cycles is being weakened by human activity through ecological footprint, which can quantify the natural capital

or ecosystem services a population uses: “If the ecological footprint per person of a country or of the world is larger than its biological capacity per person to replenish its renewable resources and absorb the resulting waste products and pollution, the country or the world is said to have an ecological deficit”.⁹ The United States’ ecological footprint is 6.8 global hectares per capita, far exceeding its biocapacity of 3.6 GHA per capita.

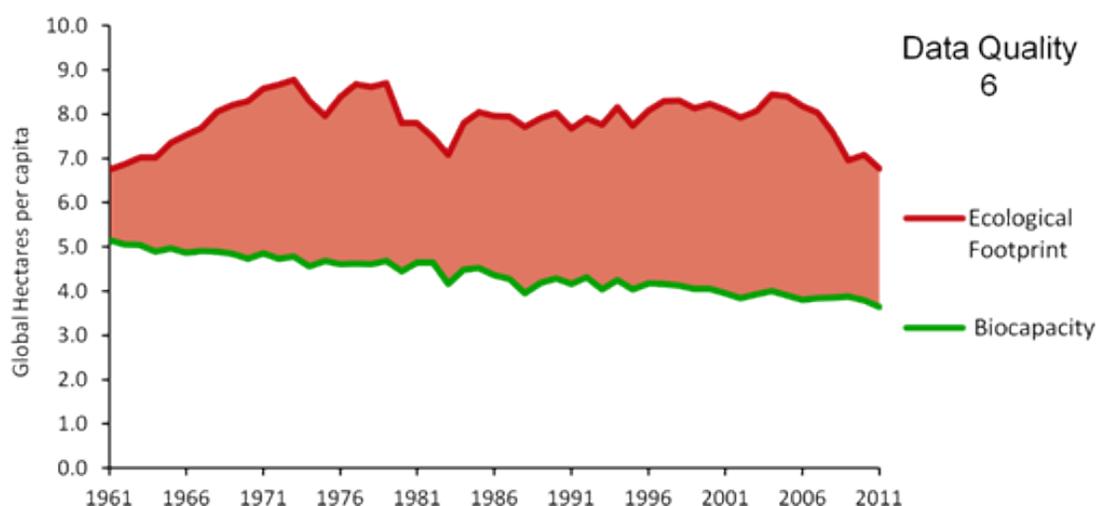


Figure 1.

Our ecological footprint exceeds our biological capacity by 90% as we can see from Figure 1.¹⁰ The United States and other nations whose ecological footprint exceeds its biological capacity accomplish such an environmental scarcity through imports of resources and emitting carbon dioxide because without such “helpful” activities, our population would be much lower due to scarcely available sustenance. The growing United States population of 323 million people, around 4.4% of the world’s population, is only made possible through our excess use of the rest of the world’s biological capacity.¹¹ It is no coincidence that the U.S. is the wealthiest country in the world, has the third largest national population, and has had one of the steadiest ecological

⁹ Miller, 30.

¹⁰ *Global Footprint Network*. “Country Trends.”

¹¹ *The United States Census*. “The World Population Clock.”

deficits over the past forty years. We have had the money and power to maintain a steady exploitation of earth's natural capital without greatly affecting any part of the American lifestyle. I will show how limiting waste generation can help to start to change that mentality because the only reason why exploiting the land has become second nature is because it has become a habit—one made possible by the illusion of human-made wealth through currency and human-made happiness through an effective economy.

Consequently, wouldn't this mean that if we keep diminishing our resources at this rate, we will run out of something soon—our population will drop, our water will run dry, our air will become deadly to breathe, or our soil will be impossible to cultivate? There have been many apocalyptic writings about the end of the world due to resource depletion. However, what if the real reason why humans have not become extinct yet is because we belong on Earth? The Earth's state is so fragile because it is built for human survival. I believe the Industrial Revolution has steered the human population away from its destiny—toward an unattainable type of happiness that is completely an illusion. Without the idea of waste on a linear model as a part of our everyday lives, human societies can begin to follow the true path to happiness that uses our intelligence at full capacity so that the Earth can benefit from us as much as we benefit from it.

We have two problems: nature cannot regenerate the goods and services as fast as we consume them and nature cannot absorb and recycle the waste as fast as we produce it, which is a feedback loop that further decreases the ability of nature to regenerate goods and services we use annually. NYC alone creates 50,000 tons of waste every day, over six million tons each year, which produces over two millions tons of carbon dioxide each year.¹²

¹² *PlaNYC 2030*, 173.

The waste must be collected, transported, and treated by a network of New York City employees using vehicles, treatment plants, and transfer stations.¹³ Unsustainability is a staple of this system due to its “heavy reliance on trucking” and high costs due to the need for distant transportation of large loads. Waste storage is a major problem, as it has no place in natural systems. How could we let ourselves create an entire waste industry that does nothing to give back to the environment...only to clean up a mess that never should have been created in the beginning? The waste management system takes away the trash we create and essentially hides it from our sight so we never think again about waste being a potential problem now or in the future. If we do not know the magnitude of the problem, we will never have the incentive to solve it. We will just keep mindlessly creating trash and buying things without thinking about the implications of their existence in the future.

Historical Bioaccumulation. Throughout the history of the United States, environmental degradation has always been a recurring issue. It has continuously taken the backburner on policymaking because it has always been a concern, but not an urgent one: “Nixon himself embraced the green theme, proclaiming that ‘we must make our peace with nature’ and reclaim ‘the purity of its air, its waters, and our living environment. It is literally now or never’ ...Nixon understood ‘the environment’ could bring together every dreamer green enough to impale an avocado seed on a toothpick and raise it up in the thin light of the Me Decade”.¹⁴ Some politicians and economists believed issues concerning the environment could bring their constituents and customers together—“it could make friends of radicals, senators, working people and the press”.¹⁵ Leaders, like Nixon who founded the Environmental Protection Agency

¹⁴ St. Clair, Jeffrey. *Been Brown So Long, It Looked Like Green to Me: The Politics Of Nature* (Monroe: Common Courage Press, 2004), 13.

¹⁵ St. Clair, 13.

and conservationist congressmen and Supreme Court justices, like Ed Muskie and William O. Douglas, believed nature deserved rights and “standing in federal lawsuits”.¹⁶ However, others like Anne Gorsuch, who headed the EPA in the 1970s and the Sagebrush Rebellion believed “environmental regulations sapped economic growth”.¹⁷ Environmental justice-fighting organizations like the Forest Service, the Audubon Society, The Wilderness Society, and Earth First! became overridden with Harvard lawyers, intertwined with people from General Motors, Exxon, and The Rockefellers who thwarted scientific evidence against environmental degradation and started green washing to make money at the expense of environmental health. “The big environmental organization were by now well pickled in the political brine of Washington, with freshness and passion largely gone”.¹⁸

Leaders have taken and continue to take advantage of the environmental crisis in the 20th and 21st century to appropriate positions in offices and then resume completely disregarding the policies they promise to set into motion. The underlying problem of these organizations, American leaders, and their inability to follow through with good intentions is the nature of our political system, which is linked to economics and lifestyle. Success and survival in our society is built on moneymaking and as soon as you realize you have an opportunity to do so, you take it and nothing else matters—especially not future generations when you and your loved ones will be deceased. The driving question I want to uncover: are we even happy in this Capitalist system of living that chains us to a dollar amount? Are we fighting for policies that will build a better life and are we even equipped to argue for such policies? While the Obama administration has taken many strides toward making environmental legislation, he must also please the other two

¹⁶ St. Clair, 13.

¹⁷ St. Clair, 17.

¹⁸ St. Clair, 18

branches and the public at large. NGO lobbyists can help to sway the government toward caring for the environment, but the real change will happen through grassroots movements locally. To have significant strides toward zero-waste in America, we must fully understand the issue and concepts of waste creation first and once grasped, the idea of waste will have no moral standing.

NYC: A Model for Waste Degeneration. Mayor De Blasio and other waste management operators are striving for more sustainable efforts in all aspects of NYC to assure its 8.4 million inhabitants that they are safe and their morale is secure. The 2014 Waste Management Sustainability report re-aligns the waste company's priorities, accomplished by shifting to a circular economy—"funneling discarded materials back into the manufacturing process...in a closed loop of innovation".¹⁹ Their concept starts at resource use—mine and extract less, reduce demand on resources, and reduce greenhouse gas emissions. The circular economy continually reduces all environmental impacts: "by reducing the generation of waste in the first place...fewer waste-related impacts to manage and more money potentially saved".²⁰ Waste management can only become sustainable if it is both economically and environmentally sustainable, which involves many facets that must be considered: financial benefits to recycling materials, the financial losses in reducing resource extraction, the environmental benefits of avoiding greenhouse gas emissions, transportation, etc. Although Waste Management is taking steps to ensure sustainability in the future, they are still responsible for over 19 million metric tons of greenhouse gas emissions each year; 135 millions of tons of landfill waste was generated in 2012, according to the EPA.²¹ In addition to landfill waste, much of America's waste is recovered and recycled, composted, or combusted. EPA is trying to convert to sustainable

¹⁹ "Creating a Circular Economy: Sustainability Report 2014". *Waste Management*, 3.

²⁰ "Creating a Circular Economy", 4.

²¹ "A Better Way to Pay for Solid Waste Management: February 2015." *Citizens Budget Commission*, 9.

material management from waste management.

Types of Waste. Landfills, incinerators, recycling plants, and sewage treatment plants are four different ways in which we attempt to handle our human waste and all require their own facility, management team, use of usually fossil fuel energy, and emit pollution, which as we know is just another form of waste.

Storing Waste. Among the 3 million tons of waste the Department of Sanitation (DSNY) in NYC collects each year, about 72% is sent to a landfill.²¹ The Fresh Kills Landfill, which used to be burdened with holding all of NYC's landfill trash, was shut down in 2001 after the DSNY created the Final Comprehensive Solid Waste Management Plan (SWMP) in 2006 in an effort to “recognize the environmental issues, treat each borough fairly, rely on sound business principles to increase efficiency and reduce cost, be realistic and be able to be implemented quickly, look forward allowing for future innovation, be reliable, be built collaboratively, and maintain service standards”.²² Their primary solution to NYC's rising rate of waste generation was exporting by barge and rail instead of relying heavily on long-haul trucks injecting the waste into a private system of transfer stations, landfills, and waste-to-energy facilities outside NY:

By moving to a system built around a barge and rail export, many of the system's current community impacts will be eliminated...as landfill capacity in neighboring states continues to dwindle, forcing the City to rely on longer-range export, a rail- and barge based system will ensure reduced transportation costs and better long-term economics for the system as a whole”.²³

According to a *City Limits* article, only one of the proposed Marine Transfer Stations has been built in order to safely transport the waste, and the operation is approaching nearly \$1 billion.²⁴

²¹ Rosengren, Cole. “New York's Garbage System Faces Mounting Challenges of Cost, Carbon and Equity.” *CityLimits.org*.

²² “Final Comprehensive Solid Waste Management Plan”, 2.

²³ “Final Comprehensive Solid Waste Management Plan”, 7.

²⁴ Rosengren, Cole.

While this might have solved local mindfulness of just how much waste is being generated in NYC, the problem was just sent somewhere else. Manhattan alone creates 40% of the New York City's commercial waste and has no private transfer station or means of storing it at any capacity.²⁵ Waste simply has no place in one of the most innovative, mass populated, sustainable, and cultural centers of the world.

This Waste Management plan also sought to rely more on incinerator waste-to-energy facilities, which are sometimes more dangerous to the environment and human health than landfills even though up front, creating energy from waste seems like a great alternative to fossil fuels. Nature uses waste, but not before it is broken down—and the waste created in nature doesn't contain forced combinations of chemicals that were never manufactured to be converted. Waste Management similarly completed a 2014 Sustainability Report recognizing their flaws:

Every day, countless tons of valuable materials are sent to a landfill instead of being returned to the value chain...Sustainable design initiatives often focus on reducing the amount of material and embedded energy in a product, but not on making the product—and its packaging—recyclable. Designers may work with traditionally recyclable materials but combine them in ways that make them difficult to disassemble, compost or recycle at end-of-life.²⁶

Therefore, they created five initiatives: design for recyclability, test existing product and package recyclability, create zero waste systems, design events and venues to reduce waste, and analyze, improve, and report on sustainability progress.²⁷ My zero-waste design for society will have similar enterprises.

Burning Waste. About 12% of NYC's waste is sent to a waste-to-energy facility each year. Incinerators were made to turn waste into usable energy: "A modern waste-to-energy incinerator with pollution controls burns mixed solid wastes and recovers some of the energy to

²⁵ "Final Comprehensive Solid Waste Management Plan", 10.

²⁶ "Creating A Circular Economy Sustainability Report 2014." *Waste Management*, 18.

²⁷ "Creating A Circular Economy Sustainability Report 2014", 19.

produce steam to use for heating or producing electricity”.²⁸ The materials brought to the incinerator include paper, wood, and other items that are not built to be burnt—the only reason they burn is because the paper and plastics are flammable. When they are burnt, they release unsafe chemicals including dioxins and toxins. In *Cradle to Cradle*, the authors note that these specific types of chemicals from incinerator fallout have biologically accumulated in nature in the form of tree leaves and the leaves themselves must be burned because they contain too high of levels of heavy metals making them become toxic—causing the death of otherwise beneficial biological nutrients that would normally be safely returned in smaller amounts to the environment to be reused.²⁹ Imagine the harmful chemicals...”a state of the art incinerator consuming 2,250 tons of household garbage daily would annually emit 5 tons of lead, 17 tons of sulfuric dioxide, 777 tons of hydrogen chloride, 87 tons of sulfuric acid, 18 tons of fluorides, and 98 tons of particulate matter small enough to lodge permanently in the lungs...the lignin from paper and wood combines with chlorine gases to form the 210 different dioxin compounds”.³⁰ Incinerators, just like landfills, waste the potential energy of objects thrown into the waste-to-energy mix. For every product incinerated, a new product must replace it further degrading the earth’s resources while causing global warming emissions.

Re-inventing Waste. Most of the recyclables we think are beneficial are actually down-cycled—their use slightly degraded. The products are not being used in the same level of efficiency. Their value and lifespan is downgraded over time—we use the product, recycle it; it becomes part of something else mixing with other materials and eventually becomes landfill waste. We are just prolonging its life, but not preventing it from becoming useless. Things that

²⁸ Miller, 571

²⁹ Braungart, 55.

³⁰ Hawken, Paul. *The Ecology of Commerce* (New York: Harper Business, 1993), 47.

are processed in recycling plants are melted down and combined to produce something new. In this process, there can be contamination and the process itself releases dioxins that pollute our environment further.³¹ In NYC, about 16% of the waste collected by the Department of Sanitation will be converted for recycling.³²

Trying to Return Waste. While composting is the best form of waste disposal humans are currently utilizing on a semi-large scale, we cannot control what possible chemicals some products might contain and when reacting with other biodegradable materials in the compost pile, they will release these harmful chemicals to the environment. As we can see, waste creation in any form that is solely treated at the end of its product life is not sustainable, emits pollution, and is dangerous.

Waste-Me-Not. Waste need not be created. Landfills need not be landfills. Fresh Kills, now a 2200-acre park (three times the size of central park), was formerly the world's largest landfill, and embarrassingly, also the largest human-made structure on Earth.³³ We can acknowledge that waste is not a good thing—in the 1800s it caused deadly cholera and yellow fever in NYC. In Staten Island, the Fresh Kills dump not only had an unbearable smell for miles and damaged the reputation of Staten Island, but also produced dangerous chemicals and compounds that caused serious illness in nearby residents including asthma, cancer, emphysema, and extreme allergies.³⁴ Waste as its own product is not just a bad thing for its direct effects on the environment and health, but also for its indirect influence on mentality and the future of the human race. We need not live a wasteful existence and in the following pages, I'll prove that a zero waste lifestyle can be adopted.

³¹ Braungart, 57.

³² Rosengren

³³ Borough President's Office. "The Fresh Kills Story." *Vimeo* video, 54:20. 2012.

³⁴ Borough President's Office.

Chapter 2. Shifting The Human Concept of Waste

What is the correct way to live? The philosophy of human life needs to question our relationship with our environment. Everything we produce that manipulates the way it would normally occur in nature essentially stays on Earth forever—nothing is ever truly “thrown away” to disappear into the abyss of the universe. Matter cannot be created nor destroyed. When something is “thrown away,” it just goes somewhere else—the landfill, recycled into something else, buried, polluting the ocean, polluting the air, or polluting our precious fresh water resources. It was not until America geared up for Industrialization that we lost all consideration of the environment and now we are recognizing the effects and starting to shift perspectives. Aldo Leopold discusses this importance of cooperation and symbioses with nature.³⁵ With a growing population that is no longer limited by food supply or disease outbreak due to advanced crop science and medicine, there must be a shift in our resource use and that can most efficiently be accomplished by changing the way in which we look at how we waste our environment. As Arne Naess accurately states by suggesting thinking differently about our treatment of the environment: “you can spend a lifetime contemplating this...It is enough”.³⁶ Human ethics have changed with the course of history as a result of a need for justification for actions. This chapter will examine the philosophies that can justify a positive and constructive environmental worldview by pinpointing the problems with a consumer ethic. I will create a comprehensive environmental ethic stemmed from the concept that our universe’s system requires a careful consideration of the principles of ecology and a thorough incorporation of them into the ethics of human nature.

³⁵ Leopold, Aldo. “Land Ethic.”

³⁶ Naess, Arne. *Ecology, Community and Lifestyle: Outline of An Ecosophy*, Translated by David Rothenberg (New York: Cambridge University Press, 1989), 1.

An Environmental Worldview. The Environmental Wisdom Worldview, as examined by Miller, maintains that humans are “part of, and dependent on, nature and that nature exists for all species, not just for us...success depends on learning how life on earth sustains itself and integrating such environmental wisdom into the ways we think and act”.³⁷ Through this mindset, humans recognize that resources are limited and should not be wasted, and that our success as a species depends on learning how nature sustains itself and how humans can implement the same concepts into how we think and act. Through the writings of Arne Naess, Aldo Leopold and Bill Devall and George Sessions, this environmental wisdom worldview is put into a framework of principles that sensibly acknowledges the human place within the environment through a deep-rooted approach. Leopold’s “Land Ethic” published in 1949 acknowledges the importance of the human connection to the ecological structure of Earth. Ethics has changed with evolution and properly involves aspects of philosophy and ecology. By definition, the combination of ecology and philosophy “has its origin in the tendency of interdependent individuals or groups to evolve modes of co-operation”, referred to as symbioses.³⁸ Symbiosis is defined by a mutually beneficial relationship—a close association of animals or plants. Instead of a community-based ethical system that involves solely humans, the land ethic “simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land”.³⁹ So how does waste factor into the land ethic? At the end of the food chain, which involves all aspects of the land, is the death and decay of living species. At this very important stage, the energy created in the food chain through the sun to the plants to the insects to the herbivores to carnivores and to the detritivores, is RETURNED to the soil.

³⁷ Miller, 25.

³⁸ Leopold.

³⁹ Leopold.

The other energy that is used in the very complex functioning of the biota is dispersed: “some is added by absorption from the air, some is stored in soils, peats, and long-lived forests; but it is a sustained circuit... There is always a net loss by downhill wash, but this is normally small and offset by the decay of rocks. It is deposited in the ocean and, in the course of geological time, raised to form new lands”.⁴⁰ As a result of humans, this stored energy has succumbed to extraction for oil that we force out of the earth in massive amounts and directly pollute the air, completely offsetting the chemistry of the atmosphere, and what Leopold highlights as essential for the health of humans, the balance of nature. We have learned from the daunting emergence of climate change, pollution, rapid species extinction, and other environmental problems that humans cannot depend on earth adjusting itself accordingly to all the ways in which we manipulate it forcibly. As Leopold states, “man-made changes are of a different order than evolutionary changes, and have effects more comprehensive than is intended or foreseen”.⁴¹ An ecological conscience involves a complex study of, understanding of, immersion in, and connection to the land. “It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration for the land, and a high regard for its value”.⁴² Wasting and polluting precious earth falls extremely short of respect.

Arne Naess originally termed the word ‘deep ecology’ in 1973 from Leopold’s stressing of a more “sensitive openness” to fellow humans, ourselves, and the environment.⁴³ The basis of deep ecology, is first to always be asking deeper questions, like Leopold writes, “Examine each question [as in actions, thoughts, etc.] in terms of what is ethically and esthetically right...preserving integrity, stability, and beauty of the biotic community”;

⁴⁰ Leopold.

⁴¹ Leopold.

⁴² Leopold.

⁴³ Devall, Bill and Sessions, George. “Deep Ecology.” *The Environment*, 513.

which is at the basis of all cultivated religions, which share its principles.⁴⁴ In the framework of deep ecology, Naess points to two intuitions: self-realization and biocentric equality. Self-realization sharply contrasts with the concepts at the heart of our modern society “which regards humans as isolated and fundamentally separate from the rest of nature, as superior to”.⁴⁵ The idea of biocentric equality deems everything in the biosphere as interrelated and so dominance over anything or anyone will not be acceptable or desired. Throughout history, as Devall and Sessions agree, we have cultivated the sense of (especially male) dominance: man over man, masculine over feminine, wealthy and powerful over poor, strong over weak, and Western culture over non-Western.⁴⁶ Today, thankfully most of these customs have become asserted and outdated except for the dominance over the material and the natural world. Deep ecology argues that the connection and realization of equality to the environment is the next step in taking down the idea of domination. Material objects that are advertised propose a false sense of desire and are designed to increase the sale of the goods and therefore, profit. Deep ecology argues that material goods have become an excuse for diverting our attention away from the “real work” of cultivating intimate spiritual growth in the form of maturing ourselves and respecting others’ unfolding while taking us away from vital needs other than food, water, and shelter that include “play, creative expression, intimate relationships”, etc.⁴⁷ Connecting with the rest of the universe is an important concept for realizing there is no place for waste creation in the world.

The Ancient Human Lifestyle. If a hunter-gatherer were to judge the modern human lifestyle, he or she would agree that the daily life has advanced too excessively: we are doing too much, wasting too much, working too much, producing too much, etc. In ancient times, humans

⁴⁴ Leopold.

⁴⁵ Devall & Sessions, 514.

⁴⁶ Devall & Sessions, 514.

⁴⁷ Devall & Sessions, 516.

rested for most of their daily lives, they had little to no material possessions; they worked very little and lived in small tribes; they ate well what was available and did not waste. Jeremy Rifkin studied the nature of humans and our evolution in his book *The Empathic Civilization*: human consciousness is soft-wired for sociability, attachment, affection, and companionship—we are not self-interested, utilitarian beings—characteristics that are necessary to drive an individual’s success in the first world today.⁴⁸ We are most driven to belong—empathy, which could explain why we have tried to adopt the very ideas that are against our human nature. Our Capitalist society is a world that depends on self-interest, of which Rifkin suggests is not inherently a part of human nature and could explain the reason for war, financial meltdown, global warming, and the problem with waste production. We have lost a connection and appreciation of the entire world because there is too much going on, but Rifkin argues that by applying a bit of human intellect, we can begin to recognize this empathy again. All humans can relate to the immense love and empathy they foster for their loved ones, whether it’s a mother, or a cat. Rifkin suggests extending this empathy that exists especially for our family to the entire biosphere completely paralleling Leopold’s Land Ethic. We have already created fictional groups of people that we can closely relate to based on town, country, religion, football team, etc. in which we trust and share love because we are a part of a similar distinction, which is exemplified in Figure 2.⁴⁹ Why can’t we include all humans, other species, and the earth as a whole? “Empathic development and the development of selfhood go hand in hand and accompany the increasingly complex energy-consuming social structures that make up the human journey”.⁵⁰

⁴⁸ Rifkin, Jeremy. *The Empathic Civilization: The Race to Global Consciousness in a World in Crisis* (New York: Penguin Group: 2009), 9.

⁴⁹ The RSA. “RSA ANIMATE: The Empathic Civilisation.” *YouTube* video, 10:39.

⁵⁰ Rifkin, 11.

Jeremy Rifkin has done extensive research on the claim that humans are inherently empathetic



Figure 2.

creatures. The “empathic predisposition is embedded into our biology”.⁵¹ Historical evolution of moral/environmental consciousness over last 2500 years has always been empathetic and for a reason I argue has to do with Capitalist control and the need for profit, has been forgotten and forcibly ignored in order to gain self-success at the expense of others who we truly care about. The industrial revolution created a Planetary Management Worldview with the idea of the separation of humans from nature (in further detail in next section). In the present, we are trying to configure an ecological conscience where the moral community includes all living and nonliving on earth—the Earth Wisdom Worldview.

Leopold’s land ethic is the current evolution of philosophy that includes an ecological necessity. The first human ethics, according to Aldo Leopold, was defining the rights and wrongs in the relationships between individuals. The next evolution of consciousness was defining the

⁵¹ Rifkin, 9.

relationship between the individual and society, which began the formation of democracy and social organization in the form of governments and community efforts.⁵² Our treatment of the land is still in an ancient phase of ethics: “Land use ethics are still governed wholly by economic self-interest, just as social ethics were a century ago”.⁵³ The treatment of humans as property (slaves) without moral consciousness was outlawed because we realized the immoral nature and horrible consequences of such a human society. I believe Leopold is referencing nature to be in a similar state as apprehended by industrial society as property instead of equal value to us. There must be a change in all aspects of human thought and action so that the land is treated ethically, instead of being treated as having little importance and significance.

The Careless Anti-Environment Worldview. Contrastingly, Planetary Management and Stewardship Worldviews are representative of the Industrial Revolution and Capitalism and have fostered the fruition of the waste problem. The Planetary Management Worldview maintains that humans are separate from nature and that our resources will forever be available through the manipulation of nature’s processes and innovative technology. The Stewardship Worldview still does not recognize humans as being a part of nature and believes that humans can manage nature’s resources as long as we maintain an ethical responsibility for our actions. Both these worldviews recognize humans as a superior life form. As we have previously seen by the research on human nature and philosophical ethics of Leopold, Naess, and Devall and Sessions, approaching nature as a lesser being to humans has many negative implications and ultimately leads to dissatisfaction, more degradation, and the cultivation of misconceptions about self purpose and human happiness.

⁵² Leopold.

⁵³ Leopold.

In Depth: Biomimicry. “Rather than argue about where to put our wastes, who will pay for it, and how long it will be before toxins leak into the groundwater, we should be trying to design systems that are elegantly imitative of climax ecosystems found in nature”.⁵⁴ Miller uses the term “biomimicry” to describe that the imitation of nature and its cycles and processes can solve most of our human problems in functioning and diminishing nature’s health and the future of the human race. Biomimicry is “the science and art of discovering and using natural principles to help solve human problems”.⁵⁵ By using nature as a framework, we can alleviate the environmental problems we have created by trying to fabricate a similar system. The big catch in the environmental ethics way of thought is that everyone must believe that what he or she is doing is what they truly want to be doing. If people “think they are in the synthetic chemical production business, and cannot change this belief, they and we are in trouble. If they believe they are in a business to serve people, to help solve problems, to use and employ the ingenuity of their workers to improve the lives of people around them by learning from nature that gives us life, we have a chance”.⁵⁶ It cannot be done with intentions of cardinal virtue: justice, temperance, courage, or prudence. The intention must be fully investing all one’s energy for the purpose of connecting to the world: people, animals, the living, the nonliving, the atmosphere, the dirt, climate oscillation, nutrient cycling, and most importantly, yourself.

Ethical Consumerism. “A type of consumer activism that is based on the concept of dollar voting...practiced through positive buying in that ethical products are favoured”; it includes the daily practice of purchasing good and services that are produced so that social and environmental impact is minimal or zero and avoiding products and services that negatively

⁵⁴ Hawken, 54.

⁵⁵ Miller, 581.

⁵⁶ Hawken, 55.

impact society or the environment.⁵⁷ The brushed-off importance of the environment stems from the heightened importance of economic value. “The basic weakness in a conservation system based wholly on economic motives is that most members of the land community have no economic value”.⁵⁸ The current economic mindset and arrangement is a driving negative guide and assurance for the degree of waste generation. The environment means little to the entrepreneur in a society where abusing the land means gaining revenue. By treating the environment as an equal, we will no longer deem it acceptable to waste the system in which we live in. We can more carefully and thoughtfully realign our priorities so that they include the happiness of our race and the planet.

⁵⁷ “Ethical Consumerism.” *Wikipedia: The Free Encyclopedia*.

⁵⁸ Leopold.

Chapter 3. Wasting Is Pricey: How Waste Production Harms Economic Goals

Half of our world's wealth lies in the hands of 1% of the population.⁵⁹ Similarly, most of the world's waste is generated by 5% of the population.⁶⁰ It is no coincidence that waste generation is directly related to monetary capital. The 1% might not be conscious of the detrimental effects of their consumerist success, but others in the world are suffering because of it—mostly third world countries. Considering our new environmental ethic, the universe is one organism and is affected by such imbalances. Corporations are abusing resources, people, and animals to get what they need for producing materials. I argue that our subconscious mantra of wasting: wasting our food, our energy, our time, and our planet's resources is harming the very supply of the ecosystem goods and services we rely on for economic activity. Humans must reimagine what it means to be a part of this ecosystem of Earth rather than controller of it. The effects of wasting resources are approaching and the effect will be harmful for economies and countries' monetary wealth around the world. Large corporations are most accountable for depreciating earth's natural capital while also being the ones most reliant on it—the overuse of it being the primary means of their success. If it is recognized that they aren't only harming the human race, but also making poor investments by exploiting natural capital, they will have incentive to transition into a zero-waste operation.

Zero Waste Incentives. What if it was more profitable to produce less? How could this ever be made possible? To improve the profitability of producing less waste, we need to look at the entire production line. I'll examine how to incentivize zero-waste at each sector of our capitalist economic model. By using the materials economy, we can easily follow how materials

⁵⁹ Treanor, Jill. "Half of the world's wealth now in 1% of population – report".

⁶⁰ "Waste Footprint." *HEC Global Learning: Global Footprints*.

become waste and try to change its path on the way to the landfill.⁶¹ A linear system does not work on a finite planet indefinitely where all ecosystem functions operate in a cycle.

The Cost of Trash. The Citizens Budget Commission of NYC (CBCNYC) conducted a report and gathered initiatives for “A Better Way to Pay for Solid Waste Management” in February 2015. They found that NY spends around \$1.5 billion dollars annually to pick up residential public trash (municipal solid waste) with 2000 garbage collection trucks that travel to distant lands in Virginia, Ohio, Pennsylvania, and South Carolina.⁶² In comparison to other cities that were analyzed in the study, NYC is a rare breed of urban centers, having free and unlimited refuse collection in the U.S. and abroad.⁶³ Incentives in this particular case are simple. If New Yorkers were acquainted with the costs of garbage collection and disposal, they might think more carefully about their waste production. “Presently, the only economic incentives to waste less are fines for noncompliance with recycling law and tax deductions for donating certain used items”.⁶⁴ Creating a fee in the form of a municipal utility bill or the purchase of official garbage bags or tags would reduce waste production, provide independent access to capital, promote fairness, and create awareness. Fees could produce some solvable problems according to this proposal including illegal dumping, the treatment of multiunit housing, public perception of a new tax, and impact on low-income households. However, the CBCNYC agrees that these issues are solvable by sustaining government-imposed fines and allowing for the dumping of large material loads, having fees vary by the building level or using the official garbage bags or bins that need to be purchased (like in the case of Seattle where a 96-gallon bin costs \$93/month while a 12-gallon bin costs \$19/month), issuing the fee as a household fee like the electricity bill,

⁶¹ Psyche Truth. “Story of Stuff, Full Version; How Things Work, About Stuff.”

⁶² “A Better Way to Pay for Solid Waste Management: February 2015”, 1.

⁶³ “A Better Way to Pay for Solid Waste Management: February 2015”, 7

⁶⁴ “A Better Way to Pay for Solid Waste Management: February 2015”, 4.

and informing citizens through extensive education programs and community development respectively.⁶⁵

Resource Extraction. In our cradle-to-grave model, valuable material resources are extracted through expensive processes. Biodegradable food and paper are thrown away in landfills instead of their precious nutrients being returned back to the soil. More than 90% of materials in the U.S. become waste almost immediately.⁶⁶ Products aren't made to last; they are made for the sole purpose of instant capital. At the extraction point, the most beneficial thing we can do to save money and the environment is to limit dangerous and forceful extraction of materials that have been deposited in rock formations several miles underground for thousands of years. By creating items that are built to last, corporations and companies can save millions of dollars a year. For example, it cost \$5 billion and 20 years just to complete construction of the BP Thunder Horse oil field in the Gulf of Mexico that succumbed to the tragic explosion in 2010 leaking oil into the ocean, damaging hundreds of animals and creating unfathomable future problems.⁶⁷ Corporations can lessen the frequency of having to find new materials and eventually run on a system where they receive back all the materials they are responsible for extracting and manufacturing and transition them for direct re-use or even up-cycling—making them better than they were before without using new materials. Another thing to consider is that as resources are dwindling, the costs of extraction are rising—there is a dire requirement to move forward without more harmful practices like hydraulic fracturing, mining, nuclear fission, etc. By avoiding resource extraction, we are not only avoiding more waste from ending up in the landfill and polluting the biosphere, but we are lessening the direct impacts: potential spills, blowouts or

⁶⁵ “A Better Way to Pay for Solid Waste Management: February 2015”, 4-10.

⁶⁶ Braungart, 27.

⁶⁷ Miller, 372.

well failures, the emission of toxic substances, displacement of humans and habitats, and the damage of natural resources. Most importantly, from an economic standpoint, we are eliminating the need for cleanup, eliminating the possibility of undercutting long-term economic prospects of cities located in industrial zones, and limiting expenditures.⁶⁸ By avoiding resource extraction, we are moving forward for more intellectual and environment-sensitive innovation in the future, gearing up for living in a society that functions in tune with the environment.

The Problem with Manufacturing Natural Systems. Manufacture/assembly is the most important stage of commercial development. The creators of a product must decide what types of materials they are making or combining, how they are making them, where they are making them, and how they can use resources most efficiently for maximum profit and minimal impact. One thing that humans have repeatedly ignored is nature's ability to provide services for us. All of nature's cycles naturally filter and reuse waste and by using nature's services instead of creating our own filtration and treatment facilities, we can save millions of dollars. In NYC, \$200 million is spent a year protecting ecosystems and managing land use to make sure the water supply is kept clean naturally.⁶⁹ If NYC had instead built a filtration facility and let its natural watershed become contaminated by development and pollution, it would have cost \$8 billion and \$300-400 million/year to operate.⁷⁰ As Steve Cohen perfectly summarizes, "we are beginning to learn that the natural environment is more than something nice to look at or camp in, that it actually does work of economic value that can improve our quality of life".⁷¹ Instead of trying to manufacture ways that produce the items that we want in the places that we want, we must

⁶⁸ "The Costs of Fracking." *Environment America*.

⁶⁹ Cohen, Steve. "Ecosystem Services Come to New York City: The Natural Way to Reduce Pollution." *State of the Planet: Earth Institute, Columbia University*.

⁷⁰ Cohen.

⁷¹ Cohen.

diversify our production expectations. At this step, it is more important to let the environment decide what can be produced in that area: “In India, where materials and energy are very expensive, people might welcome packaging that is safe to burn. In industrial areas, a better solution might be polymers designed as “food” for more bottles, with an appropriately designed upcycling infrastructure”; form follows evolution, not function.⁷² By using the systems provided to us, corporations do not have to force the production and processes that will create their products, but rather pay close attention to nature’s systems and feed them with helpful processes that follow suit. *Cradle to Cradle* discusses the design of the book:

it is made of plastics developed around a completely different paradigm for materials, polymers that are infinitely recyclable at the same level of quality—that have been designed with their future life foremost in mind...the inks are nontoxic...[and can be recovered and reused...the entire book can be reclaimed by the publishing industry in a simple one-step recycling process.⁷³

Corporations can take this example and manufacture their products so that they will nourish the environment instead of destroying it and build them to last or have a fully and easily operable life cycle.

The Necessary Reversal of Sale Price. What exactly is GDP? The Exxon Valdez oil spill of 1991 increased Alaska’s gross domestic product, which always increases with economic progress.⁷⁴ The Exxon Valdez spill created an income of people cleaning it up, which led to a rise in spending in the area.

⁷² Braungart, 140-141.

⁷³ Braungart, 70-71.

⁷⁴ Braungart, 36.

We have seen that disasters in some areas lead to economic progress in others. The environment and local residents, on the other hand, were greatly harmed:

The Valdez accident led to the death of more wildlife than any other human-engineered environmental disaster in U.S. history...only two of the twenty-three animal species affected by the spill recovered. Its impact on fish and wildlife continues today with tumors, genetic damage, and other effects...[leading] to losses of cultural wealth, including five state parks, four state critical-habitats, and a state game sanctuary...The spill took a significant toll on fisherman's income, not to mention the less measurable effects on morale and emotional health...if prosperity is judged by increased economic activity, then car accidents, hospital visits, illnesses (such as cancer), and toxic spills are all signs of prosperity. Loss of resources, cultural depletion, negative social and environmental effects, reduction of quality of life—these ills can all be taking place, an entire region can be in decline, yet they are negated by a simplistic economic figure that says economic life is good.⁷⁵

Simply put, GDP is “the annual market value of all goods and services produced by all business, foreign and domestic, operating within a country” or region, for our situation.⁷⁶ Furthermore, and maybe worse more, economic growth is defined as “an increase in a nation’s output of goods and services”.⁷⁷ “GDP is deliberately designed to measure such outputs without distinguishing between goods and services that are environmentally or socially beneficial and those that are harmful”.⁷⁸ While environmental health and human happiness might be at an unsafe low point, economic progress could be booming. As we can see from Figure 3 on page 33, while GDP or average income keeps rising, at a certain point human happiness levels off and cannot be bought at a higher price.⁷⁹ An excess of anything does not have a purpose on Earth, especially when it is harming the very processes we depend on for survival. Most products that are sold at a cheap price are extremely detrimental for the environment.

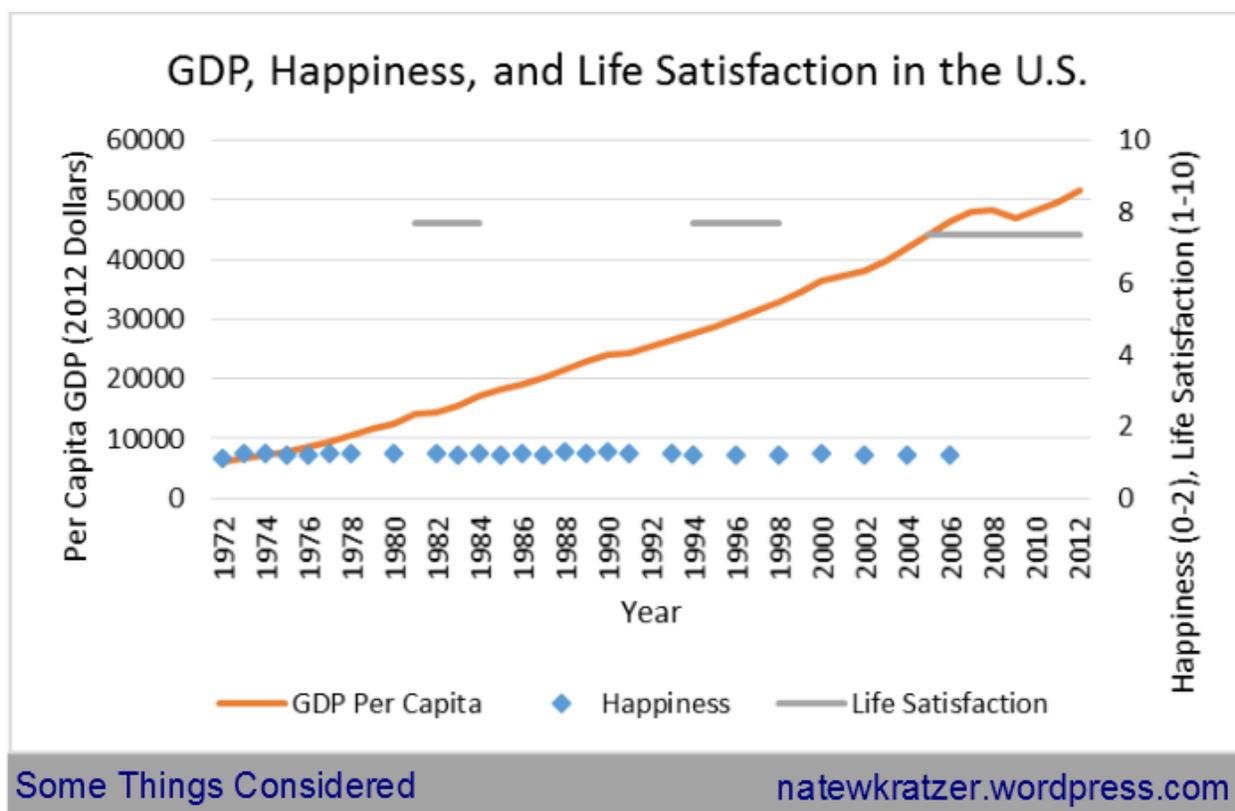
⁷⁵ Braungart 37

⁷⁶ Miller, 12.

⁷⁷ Miller, 12.

⁷⁸ Miller, 621.

⁷⁹ Kratzer, Nate W. “Coal Mining and Population Loss in Appalachia.” *Word Press*.



Notes: U.S. GDP is from the World Bank. The happiness scores are from the General Social Survey, 1972-2006, based on a scale from 0-2. Life Satisfaction scores are from the World Values Survey, with 4 waves of questions covering 1981-1984, 1994-1998, 2005-2009, 2010-2012. Life Satisfaction is measured on a 1-10 scale.

Figure 3.

The cost of environmental degradation is not factored into sale price. Teslas don't cost less than a Honda and that is because they are built to last, built with minimal environmental impact, and use better energy sources. "Gasoline is cheap in the United States because its price does not reflect the cost of smog, acid rain, and their subsequent effects on health and the environment... When prices rise, people have to reconsider usage patterns. This may be painful at first, but it generally results in innovation and creativity".⁸⁰ But in other circumstances, natural is cheaper and easier to maintain like in the case of the Hudson Watershed. It costs much less to maintain and preserve the ecosystem service of providing clean water to NYC's 9 billion citizens

⁸⁰ Hawken, 76.

than developing and maintaining a water filtration facility and we are saving ourselves and our ecosystem from wasteful treatment and possible other environmental effects of harming a water cycle. In most cases, however, the price of a system that benefits many people and adheres to an entire industry, like the NYC watershed agreement, which created employment, invested in local businesses, and promoted ecotourism sees money pouring in at a rate of \$100 million per year because of the future health of the area, will flourish. Lessening our harmful effects on the environment and its processes in any way possible saves money, which does not technically exist naturally, and eliminates waste. In the short term, sale price should include the costs of environmental damage and in the long run we will see a dwindling of purchases and a transition away from waste creation.

Consuming to Death. The Industrial Revolution was a product of a change in economic mindset—the desire for more revenue by way of making products more efficiently and getting “the greatest volume of goods to the largest number of people”.⁸¹ It led to a cultivation of cultural practices that have become obsolete: “waste pollution crude products and other negative effects...are the consequences of outdated and unintelligent design”.⁸² Ecological efficient products reduce the environmental impact of material goods while satisfying human needs and bringing in revenue for the seller. People are more prone to buy products that are more environmentally friendly. Monsanto saved \$750 million by 1997 because of their efforts to be eco-efficient by adopting a pollution-reducing program called 3M. The term’s objective, coined by the Business Council for Sustainable Development, was on the importance of becoming “competitive, sustainable, and successful in the long term” rather than “what the environment

⁸¹ Braungart, 21.

⁸² Braungart, 43.

stood to lose if industry continued current patterns”.⁸³ But if they were accomplishing reduced environmental impact and still gaining revenue, what could go wrong? Although in the case of pollution and resource extraction, less is better than more, “current studies show that over time even tiny amounts of dangerous emissions can have disastrous effects on biological systems”.⁸⁴ The goal in a zero-waste system is not to just reduce the amount of everything we do, but to change the course of everything we come into contact with and eliminate these tiny amounts. There must be regeneration and cycles—not death and a race to the landfill. Consuming too much can be bad, but reducing human activity as a whole is not the solution.

So Who Will Win and Who Will Lose in the Race to Zero-Waste? “It is not merely the environment that is being overwhelmed by toxins, it is our capacity to understand and study them. Any time a system creates by-products that harm rather than further life, it is a form of waste, and by definition, it is uneconomical. An enduring and true economy does not create waste”.⁸⁵ Every human system is in decline. Incentives to convert to a zero waste lifestyle must not be in the form of averting regulatory liabilities, taxes on pollution, or in order just to gain more customers or constituents. In order to save the human species from a world in which we are sick, the earth is covered in toxic useless waste products, and resources are scarce, the economy needs to move in a direction in which industries “are trying to change the nature of business and move toward ‘socially responsible’ commerce”.⁸⁶ NYC is on a mission to send zero waste to landfills by 2030; other local governments need to realize the necessity to take similar strides for the benefit of the human race at a hopefully faster pace than is the nature of policymaking.

⁸³ Braungart, 52.

⁸⁴ Braungart, 54.

⁸⁵ Hawken, 51.

⁸⁶ Hawken, xii.

Chapter 4. Designing The City For Reducing, Re-Using, and Recycling—Not Down-cycling

The obligation of human success by profit and cradle-to-grave principles meets the requirements of a supply and demand-based economy that has caused design flaws, functional disarray, and an unsatisfactory cultural lifestyle. The solution for limiting waste production is not only dependent on shifting broad economic and ethical perspectives, but also employing simple short term and intensive long-term urban planning changes. Manhattan, like most metropolises, is built on top of nature, trying to fend off anything that is “uncontrollable” by human design. Designing for zero-waste rests on the prospects of human convenience and needs while incorporating the natural environment. By analyzing which parts of our daily lifestyle create waste, we can explore how to eliminate them. Our system is designed in five stages: resource extraction, production/manufacturing, distribution, sale, and finally waste or resource degradation.⁸⁷ Every part of this system must become clean and efficient. Implementing a zero-waste policy from the bottom up will designate a cradle-to-cradle design approach that every manufacturer can understand and implement. PlaNYC provides a plan for zero-waste by the year 2030 in NYC. I will consider their initiatives as well as my own to establish concrete recommendations for individuals and local communities in design. The Department of Environment Protection has formed a Green Infrastructure Program for NYC that targets larger construction projects and will help to inform the more long-term plan of a zero-waste society.

Working with nature through biomimicry is a crucial aspect of redesigning our cities for zero-waste. As the NYC Green Infrastructure Plan notes, “preserving forests areas and natural buffers was a better way to keep our drinking water clean than relying upon end-of-the-pipe,

⁸⁷ “Zero Waste: The Choice for a Sustainable Community.” *Ecocycle: Building Zero Waste Communities*.

energy-intensive filtration systems.⁸⁸ The same strategy can be applied as a means of limiting waste production. We need to look away from technocratic solutions focusing on science, technology, economics, or policy; for example, plastic recycling, which involves energy-intensive recycling mills, and multiple steps including sorting, chopping, cleaning, melting, and compressing.⁸⁹ A normative solution shifts human values and lets us see that nature is working seamlessly after all. Reducing is at the forefront and will serve as a short-term viable solution to the problem of excess waste generation until an ideal society is built exclusive of the concept of waste. I argue that green infrastructure (building and development designed to work with nature) combined with localization, regular cleanups, sorting of current landfill waste, and the transition of all commodities into their next stage of life on earth will be the guidelines for a gradual evolution in a consumerist society.

Cradle to Cradle Design. Human infrastructure has only recently (in the history of human civilization) taken the route of unsustainability. For example, houses are built to be demolished. They are built only after stripping the land of all its nutrients and biological processes. Steve Cohen writes, “When we destroy natural ecosystems to develop land, we also destroy the services that those systems provide for us”.⁹⁰ Before anything has been developed on a plot, it is called a Greenfield particularly because it is green—it exists naturally with biological cycles intact and everything in environmental balance. Then construction workers and the development team, symbolically and literally, take the life out of the site and turn it into something we can then develop upon. When we have used up the site for commercial

⁸⁸ Bloomberg, Michael R., Holloway, Cas. “NYC Green Infrastructure Plan: A Sustainable Strategy for Clean Waterways”, 1.

⁸⁹ Johnson, Todd. “Recycling Plastics: The Plastic Recycling Process.” *About.com*.

⁹⁰ Cohen.

or industrial processes and it has become toxic and contaminated, it is called a brownfield. To be able to re-use a brownfield for development, the site must be cleaned up, which involves substantial time and cost. Humans believe before we live in a place, it must be built. Unlike all other living organisms, we somehow have evolved the strange idea that we are half in nature and half outside of it. There is presently a clear distinction between nature and the “architecturally modified environment” in which humans occupy”.⁹¹ In a zero-waste infrastructure, we can combine what it means to be in nature and live in society in one urban design plan. By using nature’s systems efficiently and effectively, designing our own systems based on biomimicry, and making sure each step in the five stages of our system is working toward maximum lifetime of a product and the ability for it to be completely recycled or returned, we can accomplish a natural way of living that has no concept of waste generation.

The Importance of Diverse Design. Everyone is different. It requires a lifetime of trial and error to figure out just what combination of lifestyle choices makes a person truly happy; what makes someone else happy doesn’t necessarily apply to you. This diversity holds true for the environment as well. Every species requires a different habitat to survive; every plant can grow optimally in its own perfect climate; no day is the same, etc. Our existing model of design and development purposely tries to thwart this inherent complexity. Globalism has been a result of this paradigm: “Brute force and universal design approaches to typical development tend to overwhelm (and ignore) natural and cultural diversity, resulting in less variety and greater homogeneity”.⁹² In the case of the brownfield, we construct every human structure to be the

⁹¹ Ingold, Tim. “Building, Dwelling, Living: How Animals and people make themselves at home in the world”, 179.

⁹² Braungart, 33.

same and that is the singular reason why we clear the area first of all its biological capacity—so it can fit in the universal framework that designers apply to every plot of land upon which they build. Aspects that could make the house a better place—where the sun comes in during the winter, how the trees are organized for protection from the elements, the health of the soil and water cycle, etc.—are swept away and replaced by homogeneous products and designs. The same operation happens for crop production. In these systems, the product efficiency is degrading over time: “While the economic payoff immediately rises, the overall quality of every aspect of this system is actually in decline”.⁹³ Cheap products are affordable because they don’t last. Many structures that are even considered environmentally “efficient,” are only barely meeting these guidelines. Many older buildings are still existent today while other new buildings are easily demolished by nature, such as those struck down in the 1999 earthquakes in Turkey.⁹⁴ While these buildings’ initial environmental impact is less than an average design, if they last a short time only to be replaced by something that may cause even more environmental damage, how does that serve us? Just like products, urban infrastructure needs to be designed to last, adaptive enough to be converted to other uses over time, and adherent to the unique environment of their location.

Eliminating the Concept of Waste Through Design. “To eliminate the concept of waste means to design things—products, packaging, and systems—from the very beginning on the understanding that waste does not exist”.⁹⁵ Houses, dishware, books, computers, etc. are all designed to be replaced in a certain amount of time. They live and they die. We can make products that are simple: made from one or two materials easily separated and recycled. Plastics can be up-cycled to create housing, furniture, or windmills. Buildings should exist like

⁹³ Braungart, 35.

⁹⁴ Braungart, 64.

⁹⁵ Braungart, 104.

nature, offering sun, light, air, and food. Upfront costs like purchasing better glassware will function more naturally with the life cycle of the sun and will reduce energy, psychological, and money costs in the long run.

The key is not to make human industries and systems smaller, as efficiency advocates propound, but to design them to get bigger and better in a way that replenishes, restores, and nourishes the rest of the world. Thus the “right things” for manufacturers and industrialists to do are those that lead to good growth—more niches, health, nourishment, diversity, intelligence, and abundance—for this generation of inhabitants on the planet and for generations to come.⁹⁶

We must design our cities so they can grow with the environment, not against it. We must construct streets with better walkability, to reduce vehicle-reliance for health reasons (i.e. obesity, diabetes), among others. Moreover, our vehicles can all be designed to last, to run on the electrical grid fueled by renewable-energy systems that are built to last forever. We can harness the earth’s energy and use it to our advantage while promoting the health of our planet and returning all the nutrients we borrow.

Eating for Zero Waste. Food waste is one of the most prohibitive forms of waste created on the planet. NYC restaurants create almost half a million tons of food waste each year.⁹⁷ Food is a raw material—easily returned to the environment to biodegrade in days. Mayor Bloomberg proposed reducing the food that is wasted at the source: donating and composting in community gardens and large-scale facilities like anaerobic digestion. But as a part of a long-term design plan, we can easily avoid the need to throw away food. Instead of packaging food in plastics and paper that must be separately disposed of, we can design packaging that is biologically nutritious so that once you’ve eaten the contents of the product, littering the rest of it is encouraged in order to return nutrients for environmental cycling. By implementing public community gardens that

⁹⁶ Braungart, 78

⁹⁷ PlaNYC.

are conveniently located throughout all urban areas, throwing away organics will no longer exist because compost piles and fresh food from the gardens will be so readily available, obviating the need to stock up and accidentally let items go to waste.

What Goes In Must Come Out. Besides the packaging material waste that can be completely avoided through more intuitive and case specific design, eating for zero waste must also include the actual food products we are producing and consuming. The easy answer to saving millions of tons of waste a year in the form of polluting fresh water systems; emitting methane gas, nitrates, pesticide, and herbicide runoff; and destroying thousands of acres of land that have succumbed to soil erosion due to exhaustive homogenous crop production that lead to eutrophication risking human and animal health, is to eliminate meat and dairy products from the human diet.⁹⁸ However, throughout human history, humans have had to rely on different forms of sustenance depending on the era, location, culture, and availability. While vegetarianism is the healthiest way to avoid consuming harmful hormones, diseases, and the potential acidifying effects of meat and dairy for the NYC millennial, this diet will not be viable for everyone on Earth. Instead, increasing the numbers of local urban farms that grow native plants, nurture native species, and provide a mini local ecosystem for the production of animal products will celebrate and revive the diversity of the millions of completely different complex ecosystems across the globe. A growing number of urban farms will cause a decreased reliance on large corporations, transportation, as well as a decrease in the abovementioned harmful effects associated with factory farming and large-scale food production. The farms will revitalize the local economy and inform locals about the unique nature of their ecosystem, farming, cooking

⁹⁸ D'Silva, Joyce. "Factory Farming and Developing Countries: A Compassion in World Farming Trust briefing." *Compassion in World Farming*, 8.

for maximum health for the environment and humans, and how to care for other living things without expecting a monetary return. Setbacks, especially in the beginning, will likely be intensive. By decreasing reliance on the global food industry that is responsible for creating much of the revenue through exports and imports, the economy might go into a recession, forcing shortage. However, by decreasing reliance, we are decreasing interest and therefore, starting a revolution to change the food industry and our way of life for the long term. The transition to a local food system must be steady, slow, and intuitive. Some communities will be more apt for change while others will remain stagnant; and the same goes for governments, large and small. The easiest transition is through grassroots means, starting with the use of private property and eventually teaming up with larger companies that promote local food. The larger companies have the power to disassemble the ubiquitous supply of goods available in each and every store you enter, no matter where you are. The government can advise this transition by creating a national initiative and forced subsidies to plant urban gardens and utilize them adequately.

Meat Your Farmer. Our meat industry relies on added hormones and antibiotics, is extremely energy-intensive for automated feeding, heating and ventilation, and waste removal systems, uses millions of gallons of wasted water and cropland, and produces 23% of the world's methane.⁹⁹ Animal feeds are often enriched with metals like copper, zinc, selenium, and cadmium and only 5-15% of these hormone enhancing metals will be absorbed by the animals while the rest is left to bioaccumulate in soil contaminating the crops that grow in that soil.¹⁰⁰ A meat-free diet is beneficial in some ways, but it does not exclude many of the harmful processes

⁹⁹ D'Silva, 10.

¹⁰⁰ D'Silva 9.

and design aspects in the other food you might be eating. While “organic” food labeling suggests the items are free of chemicals and constitute a better choice for a sustainable lifestyle, they may actually be more energy intensive and wasteful than those food items labeled as conventional. The best way to design for eating for zero-waste is to grow food locally because it ensures that every patron will eliminate the need for transportation as well as harsh chemicals like preservatives and hormones; the food will be more sustainable and readily available and will celebrate the diverse nature of each place on earth. When you go to Italy you eat pizza, when you go to Spain you eat paella—these are the aspects of culture that every human being relishes. There is no reason why we cannot work together to reverse the power big corporations have exerted over every industry, monopolizing and homogenizing everything and eliminating the prospects of human and natural creativity.

The No-Tolerance for Waste Urban Design Plan. Making a city zero-waste cannot happen without the combined effort of government and local community. There are two aspects of the zero-waste urban design model: what a local Samaritan can do and what the urban designers of the area can do. The local Samaritan must adopt the zero-waste mindset before attempting to change his or her lifestyle. More urban farms must be planted in order to bring back local plant life, provide sustainable, non-toxic food for the people that care for it and the environment around it, and recycle wastes. By starting urban farms, there can be a movement that will develop local food systems, eliminating vast amounts of transportation byproducts, food-waste, pollution and the unnecessary energy use. The urban designer must pay close attention to the unique nature of their designated ecosystem and provide designs or products, infrastructure, and buildings friendly to the natural environment, replenishing the cycles and using the ecosystem services. One example is while implementing local food systems on a small

scale, we can also simply just use the ecosystem services provided to treat our organic and non-organic waste. As Steve Cohen writes in “Ecosystem Services Come to New York City: The Natural Way to Reduce Pollution”, “human waste and conventional, non-toxic household waste can be filtered with natural systems powered by old-fashioned, solar-based photosynthesis”—a fancy way of saying we can use the sun to naturally break down these types of waste and keep them from piling up and instead return their nutrients to the environment”.¹⁰¹ The article focuses on the NYC’s decision to preserve its natural ecosystem service of providing clean water from the Catskill Watershed. Nature is capable of much more than we think and we have to let it function without feeling and acting on the constant need to always interfere.

The government of the city of NY has placed a priority on development with environmentalism in mind. I propose to try to keep efforts rising to green the city, with zero-waste being the first priority. The zero-waste lifestyle isn’t just a matter of urban design plans, but designing the city so that living in it does not involve wasting the goods and services of nature’s ecosystem; rather it involves reveling in and embellishing it through the flourishing of mankind. The environment is our home and the way in which we manipulate it to fit the possibilities of our imagination is just a way in which we are conveying our perception of virtue and being. Creativity and diversity in urban design is at the forefront of a zero-waste society. Designing for zero-waste means eliminating the necessity of doing too much: we work too much and as a result we burn too much of our fossil fuels, creating energy for too many electronics and systems, for too many people. By localizing societies through local food communities and biomimicry design principles, we can lessen the need to strain ourselves in the work environment, eradicating the prospects of wasting.

¹⁰¹ Cohen.

Chapter 5. Conclusion: Limiting Waste Production

Limiting our waste production is dependent on re-envisioning our society's concept of waste and creating a new system of operation. The philosophy of human life, economic models, and efficient design are dependent on how we, as individuals, choose to live our daily lives. Sustainable economic development is the foundation of a harmoniously functioning community. Waste is not just a problem because sea otters get plastic soda can holders stuck around their necks thereby threatening the food web, or that garbage mountains are taking up more and more space on earth and creating ever increasing air, land, and water pollutants, but that as humans, our opinions toward our wasteful ways remain complacent. In the short term, making it easier and more convenient to reduce, reuse, and recycle is possible by locally addressing each community's waste production and re-evaluating the ethics behind creating waste. Creating zero-waste by use of force through heavier regulations on littering, the unavailability of landfill receptacles, and the illegalization of unsustainable materials, and the requirement of installing per square mile urban farms and developing local food systems, the problem is solvable at the local level. In the long-term, every part of our society's system of functioning must become zero-waste, which involves sustaining a strong environmental philosophy through grassroots campaigns, changing developed economic models by creating incentives for large corporations and governmental organizations, and designing for nature's cycles to operate without disruption. The underlying principle humans must adopt is this: living within a cycle that involves returning everything we use back to the environment without depleting its value in the process.

Waste is a Product of Too Much Production. "Every American consumes about 136 pounds of resources a week, while 2000 pounds of waste are discarded to support that consumption...the world uses 4.1 billion pounds of pesticides a year, all of which is classified as

waste as soon as it is deployed because it remains in the environment”.¹⁰² Production has to be much more considerate involving the previously discussed human functions of empathy, intelligence, and a natural connection to the earth. Again and again, throughout my research I have read the claim that we must redesign manufacturing systems so that they do not create useless waste from the beginning instead of trying to find a solution for it at the end. I have created a list of short term and long term planning goals to implement a transition toward a zero waste society (seen on page 47). By accomplishing all of these short-term goals, we will begin to reboot nature’s natural processes to a point where they can function healthily and naturally filter its wastes.

¹⁰² Hawken, 37.

Short-Term Goals	Benefits	Long-Term Goals
Mandatory requirement to plant urban gardens	Eliminate reliance on food imports and exports; the presence of chemicals, pesticides and herbicides; and the contamination of soil, water, and the food we eat	Develop completely closed-loop local food systems that provide the community with readily available chemical-free natural foods
Adopt a vegetarian diet	Eliminate factory farming, monoculture agriculture and their effects discussed above	Foster the native diet
Create a sustainable development design	Eliminate infrastructure that contaminates the natural environment and harms the quality of life	Create design that feeds off nature and gives back all that it uses
Create biodegradable or completely reusable packaging	Eliminate landfills, incinerators and the need to ship away trash; eliminate processed food products	Create a society in which packaging does not exist
Increase reliance on renewable energy	Eliminate reliance on fossil fuel energy	Create a plan in which different areas rely on different types of renewable energy depending on what is most abundant
Lessen resource extraction	Eliminate the taking from nature and not giving back and harmful effects of nonrenewable resource extraction	Create a model where everything we have already produced can be easily up-cycled, recycled, or returned to nature

Laws, Rules, and Regulations. There is a considerable amount of government effort for waste management. The government provides the types and contents of news items seen by the population and creates incentives for large corporations to cut pollution and wasteful practices. The government is also in charge of what happens with the monetary supply and the economy. It is in the hands of international coordination committees like the United Nations to provide a new system of valuing ecosystem goods and services. In order not to be exploited, environments must be monetarily valued in a consumerist society. There must be subsidies for pollution control.

There must be a zero-waste tolerance policy incentivizing companies to put considerable time and research into revising; the paradigm must be a cyclical one, i.e. having no end in the landfill or polluting water, air, or land. Recourse for inaction must be taken directly to the Supreme Court and must shut down the violating companies' operations immediately until changes or decisions have been made. Unsustainable, environmentally-degrading materials should be deemed illegal.

While installing more urban farms can happen on the local level, there can be a government campaign to make the installations more far reaching, for example, requiring each dense urban area to create a per-square-mile amount of urban farms. Depending on the population size, density of buildings, the biome, etc., the number and size of each urban farm or total size of all urban farms in that specific square mile will vary greatly. Government initiatives can include a necessary assessment of all industrial activity that they are exhibiting a substantial effort to utilize more sustainable technology and design, replace harmful industrial packaging material, eliminate chemicals, waste, and environmental degradation, and actively contribute to the environment either by complying by the cycles in which they operate, or giving back in the form of biological nutrients, preservation, or research.

In the beginning, there can be a tax placed on each garbage bag sent to the landfill. Composting and recycling can be made more accessible by providing the necessary bins in more locations. In "A Better Way to Pay for Solid Waste Management", NY spends \$1.5 billion/year on picking up residential and public trash through 2000 garbage collection trucks that travel to distant landfills in Virginia, Ohio, Pennsylvania, and South Carolina.¹⁰³ Their proposed solution

¹⁰³ "A Better Way to Pay for Solid Waste Management: February 2015".

to lessen this hefty expenditure was to create a volume-based garbage fee that would expose service cost visibility, reduce waste, provide independent access to capital, and initiate fairness.

Below is a list of government and local incentives and policies that should be implemented:

Short Term Incentives & Policies

- Eliminate landfill receptacles and increase amount of recycling and compost bins
- Strictly enforce carbon tax and give rewards for going under carbon cap (subsidies for pollution control)
- Eliminate plastic bags
- Create a charge per municipal trash bag
- Require all companies that sell food in any manner to donate or compost remains
- Require regular testing of chemicals in air, water, and soil at the local level enforced by city and county governments
- Put forth information and news that is beneficial to fostering a zero-waste lifestyle
- Create government-funded programs to research and design for biomimicry
- Set heavy penalties for littering non-compostable materials, and taxes for misplaced garbage items

These policies are specifically designed to foster the desired change on a gradual level. If these incentives are put into place, I believe that the population can start to understand the ease and positivity of less waste and be motivated to move forward to a zero-waste custom of living.

Community Development. We might not be able to solve the problem in one fell swoop, but durable sustainability begins at the individual and local levels. Individuals must strive to live a life of the citizen, rather than the consumer. Local communities must become experts on the

unique nature of their own ecosystem so that they may effectively and accurately inform policymakers on specific guidelines to avoid disrupting the natural production of goods and services. Environments differ in their biomes, species, density, climate, level of present pollution, transportation, necessary minimum exports and imports, etc. The government has not historically maintained detailed knowledge of all environments, and has inadequately legislated. The lack of specificity has caused harm. It is necessary for local communities and associated businesses to make it a priority to work together to keep an updated scientific review of all aspects of their environment. This can be done by creating a census that reaches all households and asks questions, as well as creating a fund for research in schools and universities, in addition to regular scientific research on the area by specialists.

Designing With Our Biosphere. Designing with the ecosystem is how we will eliminate waste. “The wetlands and natural vegetation of the park [Fresh Kills], which has grown since the landfill being filled in 2001, helped buffer the impact on neighboring residential areas”.¹⁰⁴ We can see that converting the damage we have done is possible in the case of the Fresh Kills Landfill. Humans have unlimited potential in designing everything we produce in a way that mimics the cycles of nature and returns all that is taken back to the environment without scarring it. Our biosphere is incredibly complex, but in order to reach our maximum human potential, we must strive to understand and connect with our natural environment—we cannot conquer it.

From Grassroots. “Blindly adopting superficial environmental approaches without fully understanding their effects can be no better—and perhaps even worse—than doing nothing”.¹⁰⁵

¹⁰⁴ Vinnitskaya, Irinia. “Landfill Reclamation: Fresh Kills Park Develops as a Natural Coast Buffer and Parkland for Staten Island.” *ArchDaily*.

¹⁰⁵ Braungart, 59.

Braungart and McDonough are referring to the above-mentioned fact that policymakers sometimes put forward legislation that is not specific to the environment causing more harm than good. History has proven that truly passionate and successful people believe they have a purpose in life—and that implies doing something. Almost every movement and significant shift in mindset throughout history started with a singular person or small group of people who believed that something needed to be changed immediately and they were dedicated to implementing that change no matter the self-imposed consequences. We are an ingenious species. We have inhabited the entire earth from the bitter, dark cold ice of Antarctica to the blistering hot mud of India to the fluctuating climate in the concrete soil of NYC. We are capable of flying around the world in less than a day, visiting the bottom of the ocean, curing disease, and on a smaller scale, distributing deep, complex knowledge, stimulating incredible artistry, and inciting revolutions. Given this incredible human capacity, we must stop and ask ourselves if we are truly happy. Surely, we can improve upon the very circumstances we have caused ourselves, at the least. I believe true happiness can be achieved through the elimination of a wasteful human existence. Through grassroots movements, we can influence the course of history. Politics can't save us:

Social heterogeneity, geographic sprawl, and economic vitality have encouraged an intense and effective localization of politics, work, personal life, and culture. One important consequence is the difficulty of formal governance...As the urbanized area continues to expand geographically, local government becomes increasingly remote and less able to respond to grass-roots concerns.¹⁰⁶

New York represents an urban center in which people play, work, and live in a very centralized location. As I discussed in earlier chapters, the framework of our existence thrives on diversity, which can only be accomplished by the localization of governance and organization.

¹⁰⁶ Judd, 8.

“There is no grand solution which is guaranteed to save us from ourselves’...concepts cannot be fully grasped intellectually but are ultimately experiential”.¹⁰⁷ The local community must be able to respond to its own environment without the help of the national government and national organizations.

The concerns that are at the heart of the waste problem have been exposed since the 1950s. Overproduction, monoculture, human-made chemicals, pollution, economic self-interest, and monopolizing are a few. To completely rid our society of these issues, the very rationales behind these harmful practices must become undesirable, perhaps irrelevant. A slow and gradual transition to eliminate waste will require immense dedication, work, and conviction. We must arrive at a widely experienced epiphany that without change, our human race will no longer be able to connect with the magic of the natural environment. Moreover, we must feel the immense pressure that our very survival as a species on this planet depends on implementing that change.

¹⁰⁷ Devall & Sessions, 516.

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