

**Preface:**  
**Warning!**

**This book is not for the squeamish!**

Years ago, a friend of mine opened a college-level human biology textbook I wrote. As chance would have it, the book opened to the chapter on female reproduction. In fact, the pages that almost always appeared when anyone cracked open the book were those with graphic anatomical illustrations of “lady parts” (scientifically referred to as external genitalia), legs spread wide apart as if for a gynecological exam for everyone and their cousin to see. This happened time and time again, so much so that it seemed a bit like a plot by some naughty and playful cosmic force.

Upon his second or third “flashing” and his subsequent examination of the two chapters on human reproduction, my friend commented, “This book seems to have a lot on sex.”

Before I could respond, however, he realized how silly his statement was. I can’t recall his exact words, but it was something like, “Of course, that’s appropriate. Reproduction is a vital function and a key part of human biology.”

He was right, of course. None of us would be here were it not for reproduction. It’s just that so many people are uneasy with sex — especially when reminded that we’re the result of an act performed by dear old mom and dad. Now, that’s downright yucky!

*The Scoop on Poop* is another book that dwells on an often embarrassing part of human physiology — excretion. That said, I offer a stern warning: This book is not for the squeamish or faint

of heart, as it is chock full of references to human feces and urine and the processes that produce these icky products. However, if you are concerned about the fate of humankind and are interested in learning how to live sustainably and self-sufficiently on planet Earth, I urge you to look past this apparent effrontery.

*The Scoop on Poop* tackles a subject few of us think about: the value of feces, urine, and greywater. Distilled to its basics, this book is about consciously altering our lives to stop squandering the valuable nutrient-rich excretions we produce each and every day of our lives, and safely returning them to soil where they can nourish plants that feed us. This idea may be gross to many people, but it is really quite natural. The process mimics Mother Nature's "waste" recycling system and offers enormous benefits to humankind.

If the memory of a smelly campground latrine or a portable potty on a hot summer day at an outdoor concert immediately pops into your mind, capturing, composting, and reintegrating human "wastes" into soil may seem primitive and repulsive. Or, if you've ever been on a long western river trip where you were required to carry all of your group's poo out in a "honey bucket," you're probably gagging at the thought of recycling humanure and urine and applying the composted materials to your garden.

Most residents of more developed countries like Canada and the United States have grown accustomed to the flush toilet. A quick flick of the handle washes all that yucky stuff down the drain, and we're done with it.

To the skeptical, let me say that this book is not about stockpiling or handling raw human sewage. It's about designing systems that safely and odorlessly compost our "wastes," converting them to sanitary soil amendments. This book will teach you how to reclaim and utilize your bodily "wastes" and how to make this process as painless, odorless, and "unyucky" as possible.

If you have ever changed a baby's diapers, emptied a kitty litter box, or scooped dog doo up in a plastic bag from a city park or a neighbor's lawn, you'll be pleasantly surprised at how much easier and more pleasant it can be to compost human excrement — if you do it right!

But, once again, I warn you: this book is not for squeamish or queasy prissy-folk who gag at the slightest malodor. If you are one of these people, put this book down immediately. Pass it on to a friend with a stronger stomach, or return it to the bookstore for a refund.

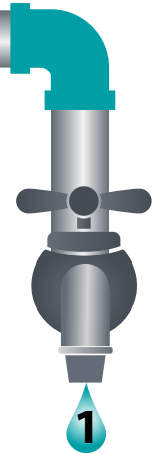
If you decide to read on, please do so with an open mind. Don't assume the worst. My goal is to introduce you to techniques that are clean, painless, and odorless. You won't be lugging around smelly buckets of excrement and urine. Nor will you need to don a hazmat suit and gas mask to successfully compost and recycle your "wastes." Remember, too: as unsavory as this activity may seem, it is one of the most important ecological and sustainable actions you can take to live in harmony with nature — that is, to fit better within the cycles of nature that ensure the continuation of all life on planet Earth.

If you want to pursue a sustainable lifestyle, you can't reach that goal simply by installing a solar electric system, growing organic vegetables, insulating your home, driving an electric car, and recycling cans, bottles, and paper. True sustainability can only be achieved by ensuring that your excretions make it back into their rightful place in nature — back in the soil that nourishes all life on planet Earth — yours included.

Many of you are already taking some of the actions I just mentioned. If you find the notion of dealing with waste to be too challenging right now, perhaps you can put this book and the instructions it contains aside for a while. You may come around to it later. But for those of you who are ready to become even better stewards of the planet and create a more ecologically sound, sustainable, and self-sufficient lifestyle, let's get to it.



## Mother Nature Gets an A, We Get an F



As soon as there is life, there's waste — lots of it. It's true of all species, from the simplest single-celled amoeba to the majestic grizzly bear: all living things ingest food and excrete wastes.

Firmly perched at the top of the food chain, humans are no exception to the rule. It doesn't matter whether you are born into an affluent family in a wealthy North American country or to a less-fortunate family in a developing country like Haiti. Collectively, the more than 7 billion human beings that call planet Earth their home produce lots of waste — mountains of waste. The wealthier the nation, the more prolific their waste production.

All told, humans excrete an estimated 1.12 trillion pounds of feces per year. That's 560 million tons a year. To put this otherwise useless statistic into perspective, daily fecal production would fill the Superdome in New Orleans nearly eight times a day — every day of the year. That's a lot of shit!

Urine production is an astounding 3.1 trillion liters per year. Daily urine production from the world's people would fill 3,400 Olympic-sized swimming pools. Over a year's time, urine production would fill nearly 1.25 *million* Olympic-sized pools. It's amazing that we are not up to our knees in pee!

Clearly, we humans produce a great deal of “personal waste.”

Humankind has dealt with its “waste” with varying degrees of success since our emergence as a species. Managing our waste, however, became an enormous challenge once we ceased our



nomadic ways and took up residence in cities and towns — a trend that started in the early years of the Agricultural Revolution approximately 10,000 years ago. As human settlements grew, so did the quantities of smelly waste.

Today, there's special urgency to the matter of human bodily excretions. With over 7.3 billion world residents in 2016, and more and more of us packed in crowded cities, human excrement has become a nightmare. With the global human population expanding by about 80 million people per year, it's safe to say that what we do about our excrement and urine could play a huge role in determining our future. The massive outpouring of feces and urine, combined with other global challenges such as exponential growth of the human population, climate change, species extinction, and soil erosion, could all combine to create the demise of human society.

The steps we take to address “waste” and other critical issues will determine whether we build a secure and prosperous future or fall flat on our face and slide down the same slippery dead-end road the dinosaurs traveled 65 million years ago. Lest we forget, we humans come with the exact same warranty as our reptilian predecessors. While dinosaurs were subjected to external forces beyond their control, we humans are actually creating conditions that could lead us to extinction.

In our efforts to create a sustainable path, there's an ecological lesson we need to constantly bear in mind. That is, in nature, there is no such thing as “waste.” In an ecosystem, what we think of as “wastes” are valuable nutrient-rich food sources for a large number of organisms. Succinctly put, in nature, all “waste” is food.

“Waste” provides nutrients to decomposer organisms such as bacteria, worms, and insects. Their excretions, in turn, help return nutrients from the “wastes” of living organisms to the soil and water. These nutrients are vital to plants and algae.

Plants and algae, in turn, form the base of all food chains on planet Earth. Put another way, they feed virtually all living organisms. Food chains provide an avenue for nutrients and energy to flow from plants and algae to the rest of the living world. Food

chains nourished by nutrients incorporated by plants and algae bind us all together in the web of life — that make our lives possible. As a result, referring to the excretions of organisms as “waste” misses a key ecological principle, and it does this valuable resource a monstrous disservice. In nature’s frugal economy, nothing goes to waste, so using the term “waste” is not just inappropriate, it’s just plain wrong.

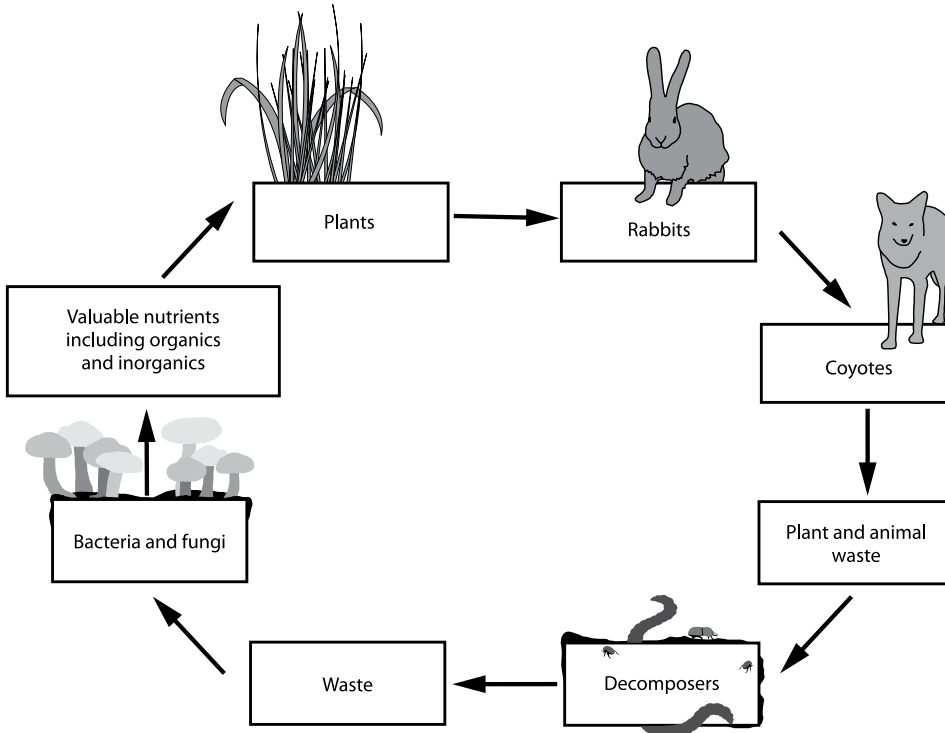
Over the course of biological evolution, Mother Nature has “devised” a plethora of strategies for survival. “Waste” recycling is one of her crowning achievements. Intricate local, regional, and global systems ensure the recycling of essential nutrients, among them carbon, nitrogen, water, and dozens of other chemicals vital to the survival and reproduction of all life forms. Excretions are recycled over and over so life can continue. Life can only continue if the nutrients in bodily excretions are placed back into the system and back into service. It’s that simple (Figure 1-1).

---

To call excretions of organisms “waste,” misses a key ecological principle, and it does this valuable resource a monstrous disservice.

---

**Fig. 1-1:** In Nature, There Is No Waste. *All nutrients travel from the environment through organisms in the grazer and decomposer food chains. In the latter, they are returned to the soil for reuse, a process that ensures life’s continuation.*



As I remind my ecology students, all life is built on the dead remains of the past. Every molecule in your body was once part of another organism — very likely hundreds of others. Those tears in your eyes may once have been in the blood that flowed through the veins of a prehistoric fish or turtle.

It's for this reason that in this book I don't refer to urine and feces as "waste" without quotation marks, signaling to you what "waste" really is — nutrient-rich material we must recycle to ensure the continuation of life on planet Earth. The only time that calling human excretions "waste" is appropriate, as you shall soon see, is when it refers to the fact that we waste so much of it.

It's a shame that, in our rush to create human settlements, few societies recognized the value of human excretions produced each and every day and that humans failed to design an ecologically intelligent system that would allow us to put our nutrient-rich "waste" to good use, as Mother Nature intended.

The next section, "A Tale of Two Toilets," illustrates two diametrically opposed strategies by which humans have dealt with "waste." One strategy continues today in many parts of the world and undermines our long-term future. The other, from our ancient past, is a model that could, if adopted in large scale, greatly enhance our prospects for building a sustainable future. You get to choose which strategy you'd like to be a part of.

### **A Tale of Two Toilet**

In the late 1800s, the city of Chicago was — quite literally — a cesspool. Teeming with immigrants struggling to eke out a living in a crowded and dangerous city, and hordes of hogs and cattle that arrived by train to end their lives in slaughterhouses, this fetid conglomeration of people and doomed livestock excreted mountains of feces and rivers of urine that either poured directly into Lake Michigan or were dumped into the Chicago River. It then flowed into the lake.

Chicago's large Union Stockyard "processed" 12 million hogs and cattle a year in the 1890s and consumed 500,000 gallons of fresh water per day from the Chicago River. Urine and feces from

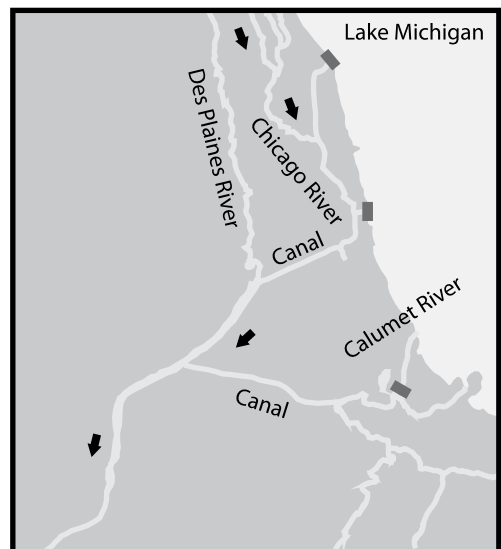
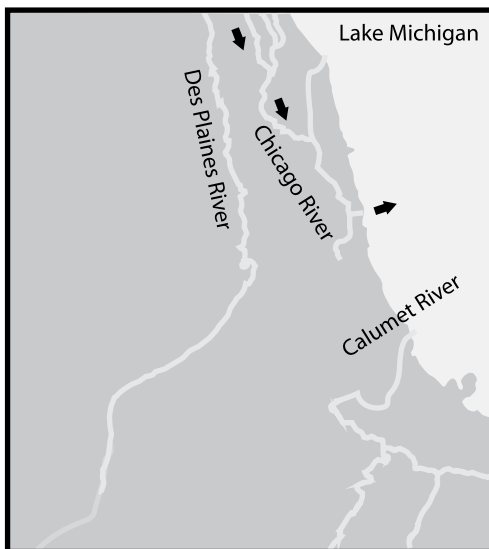


the stockyards drained into a south fork of the river. It was dubbed “Bubbly Creek” by residents because of the gas bubbles created by the tons of rotting manure that contaminated the waterway.

That was the state of “waste” disposal in Chicago and dozens of other cities throughout the world. Rivers served as sewers. It’s not much different from today, though we’ve cleaned up the effluent we pour into our rivers — at least in many of the more developed countries of the world.

In Chicago, two miles offshore, in the murky depths of the lake, were the city’s water intake cribs. Concerned that the flow of human and animal excrement into the lake was too close to the city’s water source and that pathogens in the waste might lead to an outbreak of cholera or other deadly infectious disease, and under intense public pressure, well-meaning but ecologically ignorant officials ordered the construction of a canal to divert smelly stockyard and human “waste” away from Lake Michigan. Known as the Chicago Sanitary and Ship Canal, it diverted water from the south branch of the Chicago River to the Des Plaines and Illinois Rivers. From these rivers, the wastes flowed southward into the Mississippi River and on to the Gulf of Mexico (Figure 1-2).

**Fig. 1-2:** The Great Sewage Diversion. *In the drawing on the left, you can see where sewage and waste from livestock flowed into Lake Michigan, the city’s source of drinking water. The Chicago Sanitary and Ship Canal, labeled “Canal,” in the figure on the right, diverted that water to the Mississippi River, a move like sweeping dust under a carpet.*



With a single measure, city officials solved an enormous and potentially lethal problem.

Brilliant, eh?

Well, almost.

In typical human fashion, this measure ignored an important detail. Their stroke of genius simply diverted their toxic problem to the mighty Mississippi River. This great waterway became the unlucky recipient of the city's massive daily outpouring of feces and urine from humans and livestock operations. The diversion canal was akin to sweeping dust under a rug. Making matters worse, the steady flow of "waste" from Chicago was augmented along its course by raw sewage released from the numerous rapidly growing cities and towns that dotted the river's banks.



Across the globe, in China, human "waste" management was fashioned in a distinctly more ecological manner. Here, rural peasants carried nutrient-rich excrement in buckets from their homes to the land on which they planted crops that fed their families. These nutrients nourished the soil and ensured a steady, sustainable supply of food. The practice continues today.

So, in rural China, excrement was viewed for what it was: a valuable agricultural resource. The Chinese were not the only people who recycled the valuable nutrients contained in their "waste." For centuries, numerous other Asian peoples have religiously returned nutrients from human "wastes" to agricultural soil. In Japan, prior to World War II, for instance, human "waste" was bought and sold as fertilizer. In fact, excrement from wealthy individuals purportedly sold for more because they ate a more nutrient-rich diet.

For centuries, nearly all human "waste" in Asia was collected and delivered to the soil where it decomposed. In the process, it added a wide assortment of extremely valuable organic and inorganic nutrients to life-giving farm and garden soil.

But don't think that Asia had a corner on the human waste recycling market. In England, human and livestock waste and household garbage (such as kitchen scraps) were regularly hauled

out of the city and returned to farm soil. This job fell to a group of independent contractors, known as *night-soil men*. The system was designed, in part, to reduce the putrid stench produced by a city of over 1.4 million people. In 1815, cities had no other means of “waste” disposal.

Mike Rowe (the host of the Discovery Channel’s “Somebody’s Gotta Do It”) would probably agree that those night-soil men had the dirtiest jobs ever devised. The crews had to retrieve excrement from public and private cesspits. To access the nutrient-rich material, one member of the four-man crew, the holeman, descended into the pit by ladder. He scooped up liquid sludge from the pit, and poured it into larger buckets. The buckets full of feces and urine were then lifted to the surface by another worker, the ropeman. He transferred the “waste” into a larger tub that was loaded on a cart and hauled out of the city. The “waste” was dumped on farmland. This practice went on well into the mid-1800s, when the city began installing sewer lines.

If Mother Nature were to grade the two resource management plans, Chicago would have received an F; Asia an A+.

As any organic gardener knows, organic matter like that contained in human excrement builds soil. One reason for this is that organic matter in soil acts like a sponge — that is, it helps to retain moisture, helping plants to prosper.

Organic matter also creates a nutrient-rich environment that supports a healthy population of beneficial soil microorganisms — bacteria and single-celled fungi, for instance. Some of these organisms convert the ammonia in animal waste to nitrite. Nitrite is then converted by other bacterium into nitrate. It can be taken up by plants and used to produce nitrogen-containing compounds like nucleic acids that form the genetic material of plants and amino acids that are used to build proteins.

A host of other nutrients, like phosphorus and calcium, are also released from urine and feces. These nutrients are taken up by plant roots. Plants use these nutrients to grow, reproduce, and produce fruit and seeds. As pointed out earlier, plants form the base of grazer food chains, from which all animals — including

---

As many of us learn, but few fully appreciate, in nature, animal excretions are a nutritional staple of virtually all organisms.

---

human beings — receive nutrition. Also noted earlier, plants feed most of the biological world. Urine and feces from animals are a nutritional staple of virtually all organisms on the planet.

### **Effluenza — Poisoning Our World, Poisoning Ourselves**

Despite the exalting human accomplishments — art, architecture, music, and technology — that suggest to many that humans are the crowning achievement of nature, human beings are a dangerous force. We're not just making a mess of the planet, we are poisoning

## **The Scoop on Poop**

Many people are surprised to find out what's in their feces. To begin with, human feces are largely made of water (75%). If you dry feces out, its weight declines by 75%.

The remaining 25% are solids. Of the solids, about 30% consists of intestinal bacteria — a horde of benign but highly useful bacteria that dine on undigested foodstuffs. These bacteria, for the most part, provide a wide range of valuable services to their human hosts.

Another 30% consists of undigested food matter. That's food that either can't be digested, such as cellulose (the water-insoluble fiber in celery, for instance) or food that makes it through the digestive tract without being digested — that is, broken down by enzymes.

Feces also contain about 10% fat, including cholesterol. A small amount of our feces — about 2% to 3% — is protein. Feces also contain dead cells shed from the inner lining of the intestinal tract.

What makes up the remainder?

The remaining 10 to 20% of human feces consists of valuable inorganic substances such as calcium phosphate and iron phosphate.

Why are feces brown? Feces' characteristic brown color derives from a chemical called *bilirubin*. It's nothing more than a breakdown product of the blood protein, hemoglobin. Bilirubin comes from aged red blood cells the body retires each day. As you may recall from high school biology, hemoglobin is the protein in red blood cells to which oxygen binds. Bacteria in the intestine chemically modify hemoglobin, turning it to brown bilirubin.

What about the odor given off by feces? Odor is caused by a handful of chemicals that are released as intestinal bacterial do their job of digesting food in feces.

ourselves and the millions of species that share this planet with us. We are rapidly depleting the Earth's resources, treating the Earth as if it were a corporation in liquidation. Leading the liquidation sale are the most developed of all nations. The most affluent have become the most *effluent*.

Modern resource-intensive societies are foreclosing on the human future by directing the steady stream of perfectly usable materials — like millions upon millions of tons of municipal solid waste (trash) containing valuable biological and technological nutrients from aluminum and steel to carbon and nitrogen — into landfills, which are more or less permanent tombs. Air pollution, water pollution, sewage, mine “wastes,” and factory-generated toxic chemical “wastes” add to our continuous planetary assault. But in this book, I'll focus on the “wastes” that issue from two of humankind's most vital excretory systems, the gastrointestinal tract and the urinary system.

On average, an adult human being produces between a quarter and a half pound of feces every day, depending on one's sex, food consumption, weight, and other factors. (For those using metric system, that's about 100 to 250 grams per day.) Over a year's time, we excrete 90 to 180 pounds of shit a year. Translated: most of us produce about our body weight in crap every year. (For a discussion of the contents of feces, see the accompanying textbox.)

### **Straight Line Thinking in a Circular World**

Few people who have studied the current plight of humankind in depth would disagree: we humans have charted an unsustainable course. We're depleting renewable resources such as trees, fish, and soil faster than they can be replaced. We're literally eating and consuming ourselves out of house and home. And, we're producing numerous types of pollution at rates that far exceed the planet's ability to dilute and detoxify them. As a result, we're poisoning ourselves and the species that share this planet with us. Some of our pollutants are also altering conditions like temperature and climate on planet Earth that are vital for survival. In the process, we humans are taking the remainder of the living world down with us.

The roots of our unsustainability are many. First and foremost, we've built a massive, complex, resource-intensive civilization that depends on nature but doesn't seem to recognize or respect this vital dependence. Put another way, we've built a society that gets what it needs from the Earth and ecosystems but does far too little to maintain the health of the ecosystems we depend on, which are quite literally the life-support systems of the planet.

Another reason we are on an unsustainable course is that human society continually violates the laws of nature. Chief among our foibles is a reliance on *linear thinking*.

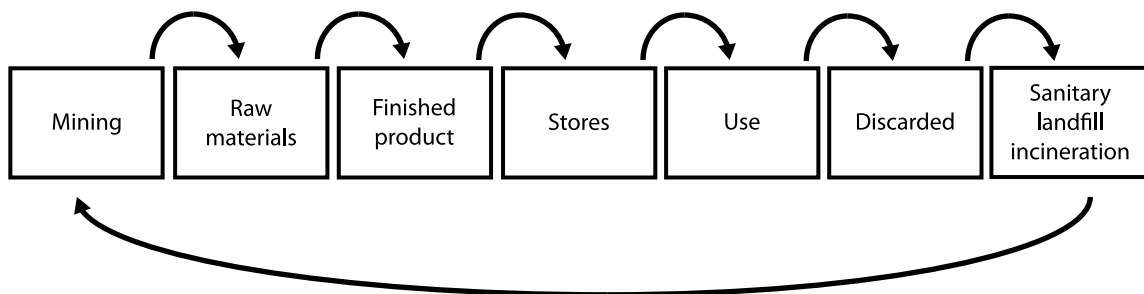
Over many years, linear thinking has shaped human civilization. Linear thinking has spawned a multitude of unsustainable linear systems that include the human economy, agriculture, waters supply, manufacturing, and “waste management” — to name a few.

Linear systems are an anathema in nature. They fail miserably in a cyclic world.

**Fig. 1-3:** Linear Production and Consumption System. *Humans have devised many remarkable systems to meet our needs and deal with our wastes. Trouble is, they are wasteful of natural resources and often harmful because they produce pollution that damages the health of ecosystems, the life support system of the planet.*

To understand the fundamental flaw of linear thinking and linear systems design, consider an example: manufacturing. To provide the goods we need, such as paper or building materials, corporations extract resources from the environment (Figure 1-3). They cut down trees, then process the wood into forms that enable us to manufacture a wide assortment of goods such as writing paper and framing lumber. These goods are sold and put to use. All is well and good ... so far.

Unfortunately, when their useful life is over — or the products we devour have fallen out of fashion — we dump them in landfills. Landfills are fancy names for dumps that serve as tombs

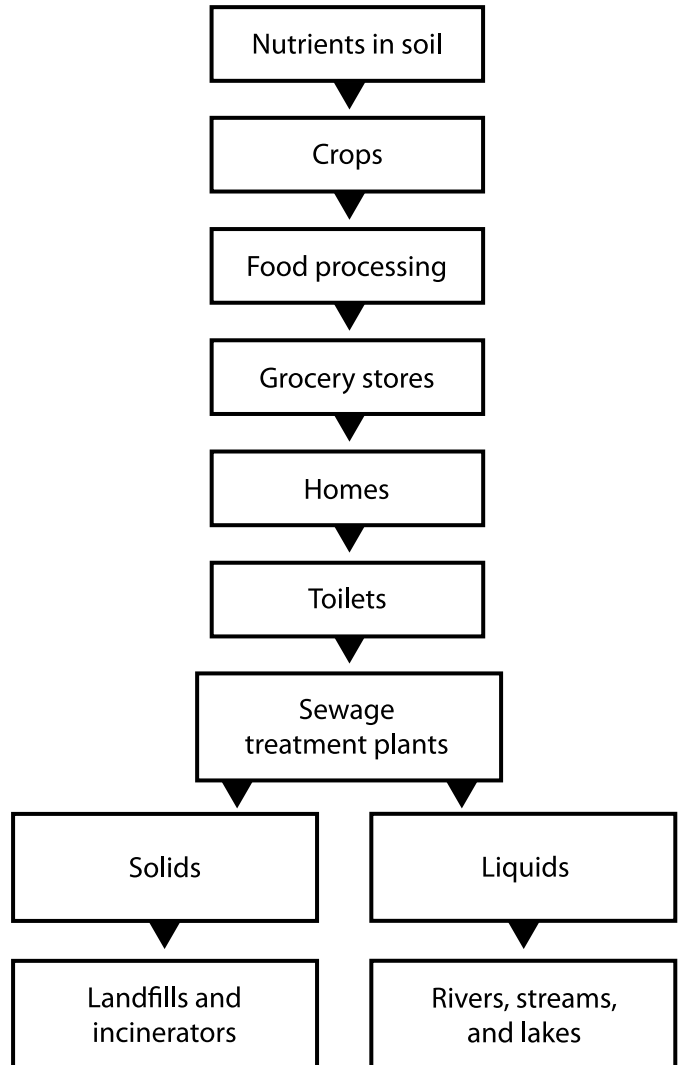


where our “wastes” remain locked up pretty much for life — unless we choose to mine them in the future (Figure 1-3).

No matter whether it is a cell phone, a television, a pair of jeans, a plastic beach ball, or a lawn chair, all products follow the same unecological path. Resources flow from the Earth’s crust and from natural and human-altered ecosystems (like farms and forests) to manufacturing facilities. From there they move to distribution outlets, stores, and then on to us, the eager consumers. When the products fall apart or out of favor, it’s off to their earthen grave. The system of production and consumption has become a one-way path to oblivion.

Global food production throughout much of the world suffers from the same short-sighted, ecologically ignorant thinking. Farmers grow food in topsoil. Manufacturers process the fruits of the earth into edible delights, sometimes removing lots of the nutrients (Figure 1-4). Food is then shipped to our tables via trucks, boats, and trains to distributors to stores to our shopping carts to our cars and our tables. We consume foods, utilizing some of the nutrients in them, like organic foodstuffs (starches) to produce energy molecules like glucose. What we don’t utilize, along with products of cellular metabolism, are excreted as feces or urine. We then deposit our “wastes” in a porcelain bowl filled with 3 to 3.5 gallons of clean drinking water. The “wastes” are flushed down the drain and make their way to a local

**Fig. 1-4: Linear Food Cycle.** *Unlike in nature, our food and the nutrients it contains flows from natural and human-altered ecosystems in an unsustainable linear fashion.*



sewage treatment plant. In these facilities, the organic solids are precipitated out, dried, and typically dumped in landfills, alongside diapers, old TV sets, and back issues of *The National Enquirer* (Figure 1-3).

The liquid portion of the “waste” stream passes through additional treatment stages designed to remove most of the pollutants — aka valuable nutrients, such as nitrogen. What’s left — the effluent — is then treated with chlorine or other chemicals to kill potential pathogens and dumped into nearby water bodies — lakes, rivers, or oceans (Figure 1-3).

From an engineering standpoint, this system is brilliant. From an ecological standpoint, it is stupid and, worse yet, suicidal. As I pointed out earlier, what is egregiously wrong about this system is that very few nutrients that travel from the soil to plants to humans to sewage treatment return to their site of origin — the farmers’ fields.

While some readers may understand the folly of nonlinear systems, most citizens are clueless that our system of food production and consumption — so vital to our survival — is a one-way nutrient pathway to extinction. It slowly but surely depletes the soils of nutrients and dumps many of them into surface waters where in high concentration they can cause disease and upset ecosystems and poison aquatic life or landfills where they can leach into groundwater.

It’s easy to reduce this to its bare bones: the “modern” human food production-consumption system is a system of nutrient depletion and pollution. Is the greatest misallocation of natural resources on the planet. And through these linear systems humankind is sowing the seeds of its own destruction.

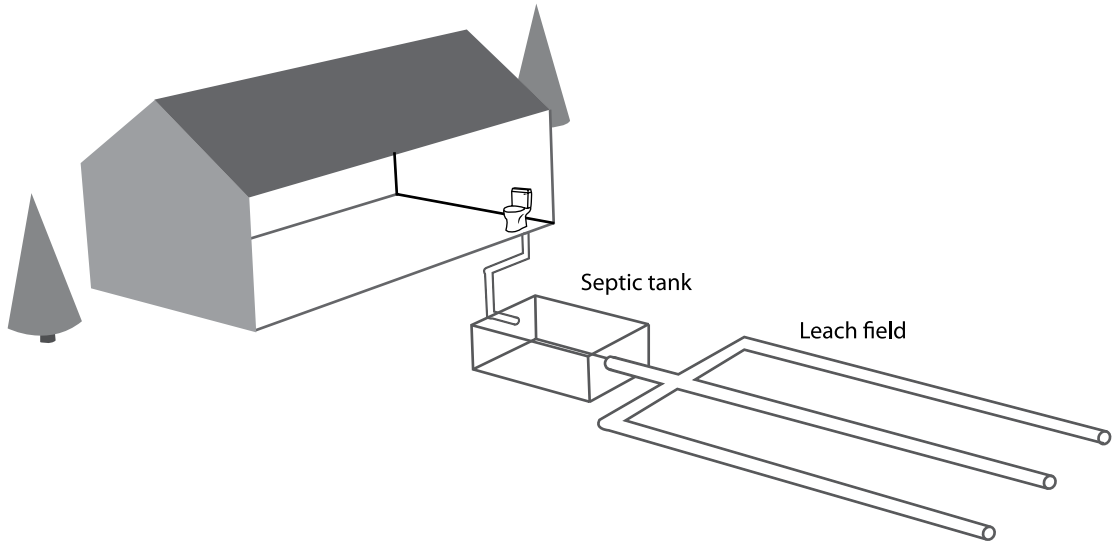
In rural areas in the developed world, the picture’s much the same — just on a more individual level. Most homeowners flush their “wastes” into 500- to 1,000-gallon septic tanks. Made of concrete, fiberglass, or plastic, septic tanks are typically buried in our backyards close to our homes. Within these now-ubiquitous septic tanks, solids settle to the bottom, slowly forming a thick layer of sludge (Figure 1-5).

---

It’s easy to reduce this to its bare bones: the “modern” human food production-consumption system is a system of nutrient depletion and toxic pollution. Is the greatest misallocation of natural resources on the planet. And through these linear systems humankind is sowing the seeds of its own destruction.

---





Liquids containing soaps, grease, dissolved organic material, nutrients, and scum fill the top layer of septic tanks. It flows out of tanks through pipes that lead to leach fields. Leach fields are nothing more than a set of porous pipes buried deep in the ground to disperse liquid “wastes.” They are designed to dispose of liquid wastes so deep that they can’t rise to the surface where they could cause problems — or nourish plants. In fact, leach fields are designed to drain downward, and hence they become a potential source of groundwater pollution.

The solid “waste” that accumulates in septic tanks is periodically removed by a special pump truck. This prevents the organic matter from overflowing and draining into the leach field, clogging up the works. Organic buildup in the pipes of the leach fields reduces the effectiveness of a field, and can clog the pipes entirely, putting a leach field out of commission.

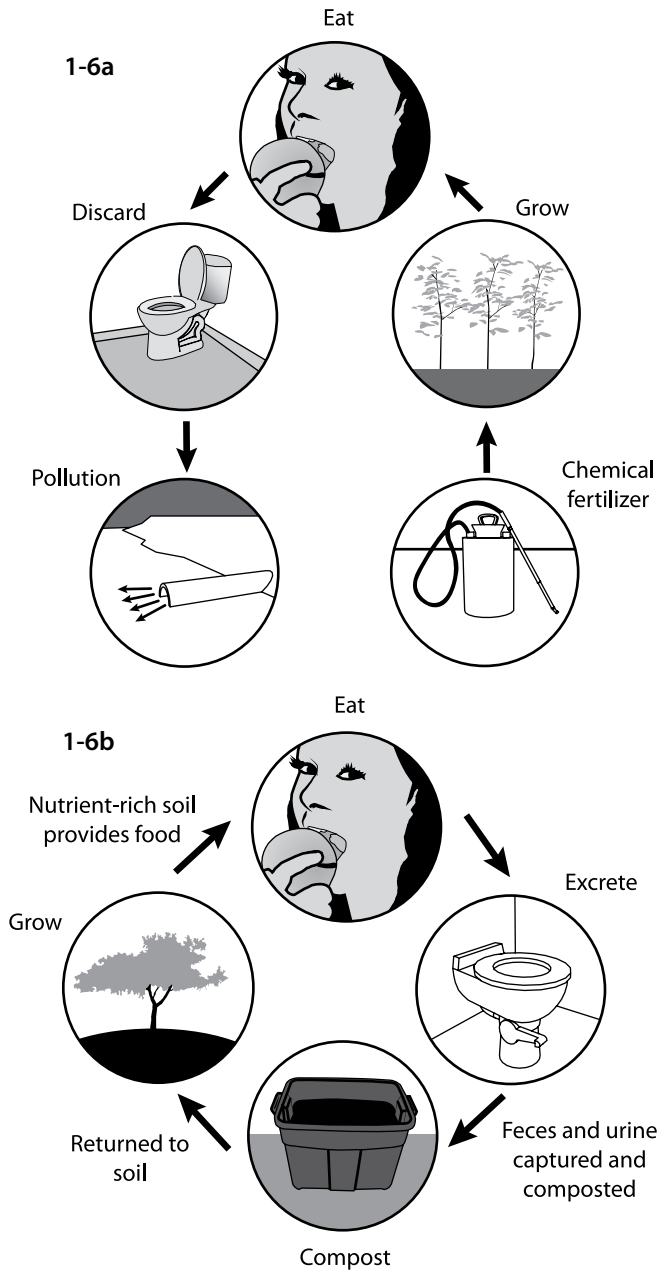
Organic sludge removed from septic tanks is typically trucked to sewage treatment plants where it is added to municipal sewage coming from homes. It suffers the same fate as urban and suburban sewage. Solids end up in landfills. Liquids end up in surface waterways. Nutrients rarely make it back to soils from which they came.

**Fig. 1-5:** Septic Tank and Leach Field. *Excretions of rural residents in more developed countries are typically deposited in septic tanks. Liquid effluent from the system drains through the leach field into the ground too deeply to be put to good use.*

---

Linear waste mis-management of material resources, especially food, is one of the key reasons human society is on a one-way road to oblivion.

---



**Fig. 1-6a and b:** Linear and Cyclic Food Production Consumption. *It doesn't take much for us to individually change the flow of nutrients to ensure sustainable food production.*

## Building a Sustainable Society

If we are going to survive and prosper, we need to end linear thinking in *all* aspects of our lives, but especially with respect to food and human bodily excretions (Figure 1-6a). Translated, we need to put our nutrient-rich solid and liquid “waste” to good use — fertilizing the land and building the soils we depend on. In returning nutrients to their site of origin, we can ensure a steady supply of food to feed us and our offspring — and theirs (Figure 1-6b).

This is where you come in.

You can play a role in closing the loops, ensuring cyclicity, in food production and consumption (Figure 1-6b). You can help by recycling your nutrient-rich “waste” carefully and safely reinserting the nutrients back into the topsoil that you rely on to raise the food you and your loved ones eat. No matter whether you live in the suburbs or a city — if you have access to some land where you can compost your waste and grow your own food — you can become a participant in this vital effort.

As Gene Logsdon notes in his book, *Holy Shit*, “We can’t truck all our waste back into the country, but we can truck it into our backyard gardens and orchards and create a sustainable lifestyle no matter where we live.”

If you live in the country and have plenty of room for these activities, all the better. You can capture your solid and liquid “waste,” treat it to be sure it is safe, and work it into the soil. More on this throughout the book.

If you raise animals, even chickens, you’ll have even more nutrient-rich manure to revitalize the soil. Raising a cow can produce about 15 tons of manure-soiled bedding each year. Calves will produce about half that. That gives you a lot of valuable material to compost, use, or even sell.

While I have no grand illusions of modern society figuring out that it has to be smarter with its waste and taking actions to recycle these valuable nutrients, I can imagine hundreds of thousands of readers like you taking matters into their own hands ... or buckets, I suppose. I can envision this dedicated legion working to eliminate the concept of “waste” from their lives, building a path to sustainability that others will then emulate.

This book is about helping you find ways to join me and others in recycling the valuable nutrients you’re currently wasting. It’s about viewing human excretions differently, much differently, not as a vile material to get rid of, but as a resource to put to good use — a material that nourishes the land, animals, and your family.

I’ll show you many options that work, give you information to get started, and discuss the pros and cons of each option. I’ll tell you how do this safely. I’ll discuss my experiences, notably what’s worked and what hasn’t. I’ll share my favorite ideas, my successes, and my failures in my continual quest to return these valuable nutrients to their rightful place.