

Self-Reliance in the 21st Century

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Chapter One: Self-Reliance Then and Now

The Difference Between Self-Reliance in 1841 and the 21st Century

What is self-reliance?

Ralph Waldo Emerson's advice in his 1841 essay *Self-Reliance* still rings true today: "*Be yourself; no base imitator of another, but your best self. There is something which you can do better than another.*"

For Emerson, self-reliance means thinking independently, trusting your own intuition and refusing to take the well-worn path of conforming to others' expectations.

This celebration of individualism is the norm today, but it was radical in Emerson's more traditionalist day. What's striking about Emerson's description of self-reliance is its internal quality: it's about one's intellectual and emotional self-reliance, not the hands-on skills of producing life's essentials.

Emerson doesn't describe self-reliance in terms of taking care of oneself in practical terms, such as being able to build a cabin on Walden Pond and live off foraging and a garden like his friend Thoreau. (The land on Walden Pond was owned by Emerson.)

Emerson did not address practical self-reliance because these skills were commonplace in the largely agrarian, rural 1840s. Even city dwellers mostly made their living from practical skills, and the majority of their food came from nearby farms. (Imported sugar, coffee, tea and spices were luxuries.)

The economy of the 1840s was what we would now call *localized*: most of the goods and services were locally produced, and households provided many of their own basic needs. Global trade in commodities such as tea and porcelain thrived, but these luxuries made up a small part of the economy (one exception being whale oil used for lighting).

Even in the 1840s, few individuals were as self-sufficient as Thoreau. Households met many of their needs themselves, but they relied on *trusted personal networks* of makers and suppliers for whatever goods and services they could not provide themselves.

Households sold their surplus production of homemade goods and family businesses offered small-scale production of specialty goods (metal forging, furniture, etc.) and services (printing, legal documents, etc.).

For example, Thoreau's family business was manufacturing pencils and supplying graphite (pencil lead). Before he took over this business on the death of his father, he earned his living as a surveyor.

Households obtained what they needed from local networks of suppliers who were known to them. If some item was needed from afar, the local source had their own network of trusted suppliers.

The government's role was also limited. The government provided postal, judicial and basic education systems and collected tariffs on trade, but its role in everyday life beyond these essential services was modest.

The conditions of Emerson and Thoreau's day—localized hands-on self-reliance was the norm and the elevation of the individual was radical—have reversed: now the celebration of the individual is the norm while few have practical skills. Our economy is *globalized*, with few if any of the goods and services we rely on being sourced locally. We rely on government and corporations for the essentials of life. Few of us know anyone who actually produces essentials.

Our primary means of obtaining the staples of life is shopping because producing basics ourselves is difficult compared to getting everything we need from global supply chains.

Emerson took the practical skills of self-reliance for granted because these skills were the bedrock of everyday life. Now skills have become specialized: we gain narrow expertise to earn our living and only hobbyists develop multiple skills.

What is self-reliance in the 21st century?

Some may feel that having a job--being *self-supporting*--is self-reliance, but relying solely on goods and services from afar isn't self-reliance. Should a few links in those long supply chains break, the entire chain collapses and we're helpless.

Money only has value when it's scarce. When money is abundant and essentials of life are scarce, money loses value. When supply chains break down, money is a measure of our helplessness, not our self-reliance.

The inner self-reliance Emerson described as *being our best selves* remains essential, but the material-world skills of self-reliance have atrophied. We rely on government and long supply chains for our necessities without understanding the fragility of these complex systems.

In the 21st century, even more than in the 1840s, self-reliance doesn't mean *self-sufficiency*. Even Thoreau used nails and tools produced elsewhere. Building a cabin on a remote pond isn't practical for most of us, and even Thoreau re-entered conventional life after two years.

What self-reliance means in the 21st century is *reducing our dependence on complex systems we have no control over*. This means *reducing the number of links in our personal supply chains* and *reducing our dependence on goods and services from afar* by 1) *consuming less* and eliminating waste and planned obsolescence; 2) *learning how to do more for ourselves and others* so we need less from the government and global supply chains; 3) *relocalizing our personal supply chains* by assembling *trusted personal networks* of local producers and 4) *becoming a producer* in addition to being a consumer.

Just as Emerson noted that self-reliance requires being our best self--something no one else can do--no one else can chart our course to self-reliance. Our path must be our own, tailored to our unique circumstances.

Self-reliance in the 21st century means moving from the artifice of trying to appear grander than our real selves in social media to the authenticity of being a producer anchored by a self-reliance that no longer needs the approval of others.

Here are some examples of what I mean by self-reliance in the 21st century.

By becoming healthy, we need fewer (ideally zero) medications that are sourced from afar and we're less dependent on costly medical interventions.

By becoming a producer in a local network, we reduce the number of links in our supply chain from many to a few. If we trade for food from local producers, there are only a few links in that supply chain. If we grow some of our own food, there are zero links in that supply chain.

By eliminating waste, we reduce our dependency on distant sources of food, energy and water—what I call the FEW essentials. If we eliminate 40% of our consumption, we've reduced our dependency on supply chains we don't control by 40%.

By buying durable products that we can repair ourselves, we reduce our dependency on the global system of planned obsolescence and waste that I call the *Landfill Economy*. The less we need and the less we waste, the lower our dependency on fragile supply chains and the greater our self-reliance.

By moving to a location near fresh water, food and energy, we reduce our exposure to the risks of long supply chains breaking down.

The more we provide for ourselves, the less we need from unsustainable systems we don't control.

Self-reliance has many other benefits. Self-reliance gives us purpose, meaning, goals, fulfillment, enjoyment and the means to help others.

Specialization and Fragility

Our economy is *optimized* (i.e., streamlined) for specialization because that's how our economy became more productive. By mastering one skill, each worker can produce more than non-specialists. This is one of the key insights of Adam Smith's *Wealth of Nations*, published in 1776: the *comparative advantages* of specialization increase the wealth of both buyer and seller.

As the global economy has become more cost-sensitive, specialization has increased. Enterprises want highly productive workers and this requires specialization.

The higher our skill, the more valuable we are and the more we earn. The financial incentives favor specialization rather than broadening our real-world skills.

The financial incentives for developing real-world self-reliance are marginal. If repairing a toaster takes two hours and we're paid \$25 an hour at our job, that's \$50 of time. If a new toaster costs \$25, why bother learning how to repair the broken one? Hobbyists may repair things, but for most people, it makes sense to devote their time to making money and toss the broken toaster in the landfill.

This is why we have a *Landfill Economy*. We measure prosperity by how much gets tossed in the landfill and replaced with something new. If we measured prosperity by how long products last and how easy they are to repair, we'd have much different incentives and a much different economy.

Valuing everything in terms of time and convenience makes sense in an era of endless abundance but it breaks down in an era of scarcity. If things are no longer cheap and accessible with an on-screen click, then the calculation of what's valuable changes.

The conveniences of the 21st century come at a cost few recognize: our dependence on long supply chains that are inherently fragile. These chains of specialized production and distribution

we depend on only function if every link works perfectly, but things are no longer working perfectly. These long supply chains are decaying right before our eyes.

The era of abundance has ended and we're not prepared for an era of scarcity.

Since few of us know anyone who produces anything tangible. Our social networks are completely disconnected from the production of life's essentials. We're completely dependent on products made thousands of miles away delivered by supply chains powered by diesel.

As these systems decay and scarcities drive prices higher, the incentives change. What becomes convenient and low-cost is producing essentials within our own local networks. Specialization will still be valuable in terms of producing surplus which can be traded or sold locally, but specialization is no substitute for practical knowledge.

Abundance gave us the time and means to express our uniqueness on social media. In a world of scarcity, our uniqueness will find expression in becoming productive in a network of other producers.

Self-reliance in the 21st century demands both the inner strengths Emerson promoted and the real-world skills and trusted local networks he took for granted that we have lost.

Many people believe that scarcities are temporary and abundance will soon be restored. They are mistaken, and it's important to understand why.

What Are the Essentials of Human Life?

Before we address scarcity, we need to define *essentials*. There are two ways of thinking about the essentials of human life: one is psychologist Abraham Maslow's *hierarchy of needs*, which many visualize as a pyramid of physiological needs as the base, with the higher levels being security and love, belonging and self-worth, and what Emerson called *being our best selves*, what we now call *self-actualization*.

In this approach, food, water, clothing, shelter and energy are the basic physiological needs without which we perish. Above basic survival, we need safety / security and belonging to a supportive family and group. Above those basic emotional needs, we need self-respect. At the top of the pyramid is becoming our best selves via self-knowledge and self-expression.

The second approach is to look at the complex system that provides our basic needs as an iceberg where 90% of the system is not discernable. For example, we think of food being available at supermarkets without grasping the immense system that grows and harvests the grains, raises and slaughters the animals, processes and packages all these products and delivers them thousands of miles to markets near us. The systems that provide us with fresh water, clothing, shelter and fuel are equally complex and costly.

In other words, our food supply doesn't just rely on farms and farmers. It relies on roads and diesel fuel, because the vast majority of our food travels hundreds of miles on trucks. It depends on spare parts being available for tractors, trucks, aircraft and many other machines such as freezers, as well as parts for the oil wells, pipelines and refineries that provide diesel fuel for the tractors and trucks.

The grapes flown in from thousands of miles away require jet fuel, air cargo containers, refrigerants and spare parts for jet engines.

Many of our basic essentials come from overseas: fabric and clothing, minerals such as cobalt and the materials needed to make pharmaceuticals.

These long supply chains need millions of machines to work perfectly to function. All these machines depend on a vast industrial base for their manufacture, maintenance and operation.

Compare these fantastically complex and costly 21st century systems without which the basics of human life disappear with the sources of essentials in Emerson's 19th century America. Food was grown within walking distance even for city-folk, clothing was often sewn at home and shelter was built out of local materials.

If we look at these systems as networks with nodes and connections, we ask: how many intermediary links are there between the source of the food and our table? In the 19th century, there was often no intermediary link at all: the harvest was turned into food within walking distance. Now there are dozens of links in every chain connecting us to the sources of what we need to survive.

If even one link in those chains fails, the chain is broken.

What are the essentials of human life nowadays? Food, water, clothing, shelter and energy, and all the parts of the vast industrial system that processes and delivers these essentials to us.

The greater our dependence on long, complex chains, the lower our self-reliance because we cannot possibly influence these chains. If they break, we're helpless. Our only leverage is to reduce our dependency on these chains and reduce the number of intermediary links between the source of essentials and our household.

Reducing dependencies and shortening our supply chains are the core principles of self-reliance in the 21st century.

We cannot reduce our dependency on complex, costly supply chains to zero, but we can reduce our dependency in consequential ways. Which is preferable: to be 100% dependent on long supply chains for food, or source half of your food within walking distance? Which is preferable: to need 100 gallons of fuel a month just to get by, or 10 gallons?

Let's look at why self-reliance will become increasingly valuable as unsustainable systems start breaking down.

Global Disruptions Are Affecting Everything and Everyone

The conventional media has a vested interest in maintaining confidence in the status quo, and so blunt realities are softened into acceptable pabulum. For example, globalization is presented as win-win for everyone, when the blunt reality is the benefits flowed to the few at the expense of the many: American corporate profits soared from less than \$700 billion in 2002 just after China entered the World Trade Organization (WTO) to \$3.4 trillion annually in 2022.

While America's economy (GDP) rose 2.3-fold in those 20 years, corporate profits soared almost five-fold. (Source: St. Louis Federal Reserve Bank.)

This astounding increase in corporate profits was not a happy accident.

Corporate profits soared because Corporate America (along with other global corporations) shipped production to China and other low-wage, lax environmental standards nations, cutting costs and quality while keeping prices high. Pressured by globalization, the wages of American workers lost ground.

Globalization was never win-win; it was win-lose: those reaping the immense profits won and everyone else lost. Yes, the cost of a few products dropped, but the quality dropped even more. Corners were cut to boost profits and so the poor-quality product soon ended up in the

landfill. Before globalization, products lasted decades; after globalization, they only last a few years and have to be replaced. How is that a win for consumers?

Now the boom in China is unraveling, and once again we're not being told the blunt reality: corporations are shifting production out of China because the changing political and economic landscape is threatening their fat profits.

The dynamics disrupting the global economy are presented piecemeal, when in fact each source of disruption reinforces the others.

Once we understand the self-reinforcing nature of these disruptions, we realize the global system is changing permanently and these changes will affect everyone. These disruptions are not temporary or trivial. They are long-term and cannot be reversed, any more than time can be reversed.

1. Climate change. Drought, flooding and extreme temperatures are disrupting agriculture and pushing habitable regions into being uninhabitable. Food will be scarce and expensive. (See the following section on the end of cheap food.)
2. Disease and pandemics. Global air travel enables mutations and rapid spread of microbes.
3. Long supply chains. (See following sections.) These fragile chains are disrupted by pandemics, geopolitical conflicts, economic and labor turmoil and scarcities of essential commodities.
4. Domestic political turmoil. Global sources of disruption--soaring energy and food prices, hardship caused by climate change, financial bubbles popping--fuel political discontent.
5. Labor discontent. Demographics and labor shortages are pushing global wages higher; workers are demanding living wages, leading to strikes and other disruptions.
6. Depletion of cheap, easy-to-get resources. If energy is still abundant, why are we drilling so deep in such inhospitable places and mining tar sands? The low hanging fruit has been picked, what's left is hard to get. This can't be reversed.
7. War and conflict. Wars to control resources are disrupting supply chains and globalization. Wars are being waged on numerous fronts: cyber warfare, proxy warfare, Cold Wars, hot wars, rebellions, etc.
8. Unraveling of global finance. Currencies, credit, risk and assets are all being repriced. Volatility is now the norm.

Everyone who is dependent on the global economy for goods, services and income has become dependent on a system that is unraveling. Disruptions in one region quickly spread, eventually affecting everyone. One domino topples a line of other dominoes that end up knocking down all the dominoes.

The idea that all these sources of disruption will go away and all the dominoes of global abundance can be set up again is not realistic. What's realistic is to start reducing our dependence on long supply chains by relocalizing our production of life's essentials. Since we can't count on authorities being willing or able to move fast enough to matter, the best option is to relocalize our own supply chains and reduce our dependence on systems that are unraveling. The term that describes this is *self-reliance*.

Our Unsustainable Economy in a Nutshell: Energy and Resources

Beneath its surface stability, our economy is precarious because the foundation of the global economy-- cheap energy--has reached an inflection point: from now on, energy will

become more expensive. There will be temporary drops in price but over time, the trend is higher costs and more frequent shortages.

The problem is the price can't be high enough for producers to earn enough to reinvest in more production and low enough for consumers to afford it. Consumers will not have enough money left after paying for energy to spend freely on discretionary goods and services, so the consumer economy will shrink.

For the hundred years that resources were cheap and abundant, we could waste everything and call it growth: when an appliance went to the landfill because it was designed to fail (planned obsolescence) so a new one would have to be purchased. That waste was called *growth* because the Gross Domestic Product (GDP) went up when the replacement was purchased.

A million vehicles idling in a traffic jam is also called *growth* because more gasoline was consumed, even though the gasoline was wasted.

This is why the global economy is a *waste is growth Landfill Economy*. The faster something ends up in the landfill, the higher the growth.

Now that we've consumed all the easy-to-get resources, all that's left is costly to extract. For example, minerals buried in mountains hundreds of miles from paved roads and harbors require enormous investments in infrastructure just to reach the deposits and ship them to distant mills and refineries. Oil deposits that are deep beneath the ocean floor are not cheap to get, regardless of what technology is used.

Does it really make sense to expect that the human population can triple and our consumption of energy increase ten-fold and there will always be enough resources to keep supplies abundant and prices low? No, it doesn't.

Many people believe that nuclear power (fusion, thorium reactors, mini-reactors, etc.) will provide cheap, safe electricity that will replace hydrocarbons (oil and natural gas). But nuclear power is inherently costly, and the technologies many pin their hopes on are still being developed. They are years or even decades away from generating electricity for consumers.

Reactors take many years to construct and are costly to build and maintain. Cost over-runs are common. A new reactor in Finland, for example, is nine years behind schedule and costs have tripled.

The U.S. has built only two new reactors in the past 25 years.

The world's 440 reactors supply about 10% of global electricity. There are currently 55 new reactors under construction in 19 countries, but it will take many years before they produce electricity. We would have to build a new reactor a week for many years to replace hydrocarbon-generated electricity. This scale of construction simply isn't practical.

Supplying all energy consumption globally--for all transportation, heating of buildings, etc.--would require over 10,000 reactors by some estimates--over 20 times the current number of reactors in service.

Many believe so-called renewable energy such as solar and wind will replace hydrocarbons. But as analyst Nate Hagens has explained, these sources are not truly renewable, they are *replaceable*; all solar panels and wind turbines must be replaced at great expense every 20 to 25 years. These sources generate less than 5% of global energy, and it will take many decades of expansion to replace even half of the hydrocarbon fuels we currently consume.

To double the energy generated by wind/solar in 25 years, we'll need to build three for each one in service today: one to replace the existing one and two more to double the energy being produced.

Since wind and solar are intermittent sources of energy, we must maintain a backup system for when the sun goes down and the wind diminishes. This means the full cost of relying on intermittent sources is far higher than when we only had one system powered by hydrocarbon fuels: now we must pay to operate two systems rather than one.

All these intermittent sources require vast amounts of resources: diesel fuel for transport, materials for fabricating turbines, solar panels, concrete foundations, and so on.

Humans are wired to believe that whatever we have now will still be ours in the future. We don't like being told we'll have less of anything in the future.

The current solution is to create more money out of thin air in the belief that if we create more money, then more oil, copper, etc. will be found and extracted.

But this isn't really a solution. What happens if we add a zero to all our currency? If we add a zero to a \$10 bill so it becomes \$100, do we suddenly get ten times more food, gasoline, etc. with the new bill? No.

Prices quickly rise ten-fold so the new \$100 bill buys the same amount as the old \$10.

Adding zeroes to our money (*hyper-financialization*) doesn't make everything that's scarce and hard to get suddenly cheap and easy to get. Minerals are still scarce and hard to get no matter how many zeroes we add to our money.

Many people feel good about recycling a small part of what we consume. But recycling is not cost-free, and the majority of what we consume is not recycled.

The percentage of lithium batteries that are recycled, for example, is very low, less than 5%. We have to mine vast quantities of lithium because we dump 95% of all lithium batteries in the landfill. There are many reasons for this, one being that the batteries aren't designed to be recycled because this would cost more.

The majority of all manufactured goods--products that required immense amounts of hydrocarbons to make--are tossed in the landfill.

Our economy is precarious because it's in a lose-lose dilemma: resource prices can't stay high enough for producers to make a profit and reinvest without impoverishing consumers. Prices can't stay low enough to allow consumers to spend freely without producers losing money. If producers don't make enough to reinvest, supplies decline and scarcities increase.

Playing hyper-financialized games--creating money out of thin air, borrowing from tomorrow to spend more today and inflating speculative bubbles in stocks and housing--doesn't actually create more of what's scarce. All these financial games make wealth inequality worse (*hyper-inequality*), undermining social stability.

The economy has reached an inflection point where everything that is unsustainable finally starts unraveling. Each of these systems is dependent on all the other systems (what we call a *tightly bound system*), so when one critical system unravels, the crisis quickly spreads to the entire system: one domino falling knocks down all the dominoes snaking through the global economy.

Those who understand how tightly interconnected, unsustainable systems are effectively *designed to fail* can prepare themselves by becoming flexible and open to the opportunities

that will arise as the economy shifts from the Landfill Economy's consumer spending to maintaining essential infrastructure.

The End of Cheap Food

Of all the modern-day miracles, perhaps the least appreciated is the incredible abundance of low-cost food in the U.S. and other developed countries.

The era of cheap food is ending, for a variety of interconnected reasons.

I have long had an interest in growing food, dating back to my teens 50 years ago. I have been a gardener for decades, but my knowledge has expanded over the past four years as we have sought to grow as much high-quality food as possible on our residential lot.

I've learned about food production from research, my *Of Two Minds* blog correspondents and my own experience of *hands in the dirt*.

What I've learned is that *every little bit helps*--even small backyards / rooftops / greenhouses can provide significant amounts of food and satisfaction.

I've also learned that almost every temperate *terroir*/micro-climate is suitable for some plants, herbs, trees and animals. (*Terroir* includes everything about a specific place: the sun exposure, soil type, climate variations, etc.)

Choosing crops that fit the *terroir*—i.e., they grow without much intervention—and nurturing a diversity of crops are key features of localized production

We've forgotten that big cities once raised much of the food consumed by residents. Small plots of land, rooftop gardens, backyard chicken coops, etc. can add up when they are encouraged rather than discouraged.

What's striking is how disconnected many of us are from the production of the food we take for granted.

A great many of us know virtually nothing about how food is grown, raised, harvested / slaughtered, processed and packaged.

Highly educated people cannot recognize a green bean plant because they've never seen one. They know nothing about soil or industrial farming. They've never cared for any of the animals that humans have tended for their milk, eggs and flesh for millennia.

Most of us take the industrial scale of agriculture and the resulting abundance for granted, as if it was a birthright rather than a brief period of reckless consumption of resources that is ending.

Trying to make money by growing food on a small scale is difficult because we're competing with industrial agriculture powered by hydrocarbons and low-cost labor in distant lands.

That said, it is possible to develop niche products with local support by consumers and businesses. This is the *Half-X, Half-Farmer* model I've discussed in my blog: if the household has at least one part-time job that pays a decent wage, the household can pursue a less financially rewarding niche in agriculture/animal husbandry.

Industrial agriculture includes many elements few fully understand. The shipping of fruit thousands of miles via air freight is a function of 1) cheap jet fuel and 2) global tourism, which fills airliners with passengers who subsidize the air cargo stored beneath their feet.

When global tourism dried up in the Covid lockdown, so did air cargo capacity.

I have to chuckle when I read an article about a new agricultural robot that will replace human labor, as if human labor were the key cost in industrial agriculture. Fertilizer, fuel, transport, animal feed, compliance costs, land leases and taxes are all major costs that robots don't eliminate. Furthermore, robots have their own operational and maintenance costs.

Left unsaid is the reliance of industrial agriculture on soil, fresh-water aquifers and rain. Irrigation is the result of rain/snow somewhere upstream. If it doesn't rain or snow upstream, the water needed for irrigation dries up.

Once the soil and aquifers are depleted and rain become erratic, the robot will be roaming a barren field.

The entirety of global food production rests on soil and rain. Robots don't change that.

What few of us who rely on industrial agriculture understand is that it depletes soil and drains aquifers by its very nature (i.e., maximize yield and profit today, never mind about tomorrow), and these resources cannot be replaced with technology. Once they're gone, they're gone.

Soil can be rebuilt but it can't be rebuilt by spreading fertilizers derived from natural gas over industrial-scale tracts of land.

Few people appreciate that the dirt is itself alive, and once it's dead it loses fertility. Whatever can be coaxed from depleted soil by chemical fertilizers lacks the micronutrients that plants, animals and humans all need.

Every organism is bound by the *Law of Minimums*: heaping on a few nutrients is useless unless all the other essential nutrients are available in the right quantities. For example, dumping excessive nitrogen fertilizer on a field won't make it yield more unless it has sufficient calcium, zinc, sulfur, magnesium, etc. All adding more nitrogen fertilizer does is poison waterways as the excess nitrogen runs off.

Irrigation is another part of industrial agriculture few understand. Over time, the natural salts in water build up in irrigated soil and the soil loses fertility. The drier the climate, the less rain there is to leach the salts from the soil. Irrigation isn't sustainable over the long run.

Plants need reliable conditions to reach maturity. Should a plant be starved of water and nutrients, its immune system weakens and it is more vulnerable to diseases and insects.

Extreme weather wreaks havoc on industrial agriculture. A crop can take months to reach maturity, and then a pounding rain can ruin the entire harvest in a few hours.

Most people assume there will always be an abundance of grains (rice, wheat, corn) without realizing that the vast majority of the world's grains come from a handful of regions with optimum conditions for industrial agriculture.

Should any of these places suffer erratic weather, then exports of grains will shrink dramatically. Once cheap grains are gone, cheap meat is also gone, because industrial-scale meat production depends on grain feed.

The scale required to grow an abundance of grain is monumental. Great expanses of Iowa, for example, are fields of corn and soybeans, much of which becomes animal feed.

American tourists who ooh and ahh over artisanal goat cheese in French or Italian villages have little appreciation for the human labor that goes into the artisanal food, labor that can't be replaced by robots except at industrial levels of production.

Industrial agriculture only works at vast *economies of scale* and *high utilization rates*. A 10-pound bag of chicken thighs is only \$25 because tens of millions of chickens are raised in carefully engineered factory conditions and slaughtered / cleaned on an industrial scale.

Economies of scale lower costs by spreading the costs of labor and overhead—the factory equipment, maintenance, insurance, administration, etc.—over millions of units rather than hundreds of units. If the factory produces a million units with the same workforce rather than a thousand units, the cost per unit will drop substantially.

To maintain the low cost per unit, the factory has to run at close to full capacity—the utilization rate has to be high. If production declines from one million units per month to 100,000 units a month for whatever reason—a shortage of materials, disruption of deliveries, a labor strike—the cost per unit rises sharply, and the company's profits drop.

Should the utilization rate fall over time, the operation ceases to be economically viable. No business can operate at a loss for long, and so production is shut down.

The global scale of industrial agriculture relies on exploiting low-cost labor forces and soil that hasn't yet been depleted. This is why clear-cutting the Amazon is so profitable: hire desperate workers with few other options to earn cash money, strip the soil until it's infertile and then move on.

It's slash-and-burn agriculture on an industrial scale.

There are many misunderstandings about industrial agriculture's reliance on cheap fuel and fertilizers derived from natural gas. Many pin their hopes on organic vegetables without realizing every organic tomato is still 5 teaspoons of diesel and 5 teaspoons of jet fuel if it's grown on an industrial scale and shipped via air. The organic vegetable is only less energy-intensive if it's grown locally on small-scale farms.

Much of the planet is not conducive to high-yield agriculture. The rain and weather are not suitable, or the soil is poor. Building up soil is a multi-year process of patient investment that isn't profitable for industrial agriculture.

Much of the grain we rely on is not easy to grow and process. It must be harvested, threshed, sorted, dried, milled, protected from insects and decay and then shipped thousands of miles. The price of rice, flour and corn meal is only low if the entire process is mechanized.

As a means to make money, small-scale food production can't compete with industrial agriculture. But that's not the goal of self-reliance.

The goal is to reduce our dependence on diesel-powered industrial agriculture by increasing our own local production, and grow a surplus that helps feed our trusted network of family, friends and neighbors.

As industrial agriculture depletes the last of its soils and aquifers, as fuels and fertilizers become increasingly costly, and as weather extremes disrupt the 50+ years of relatively reliable weather we've enjoyed, cheap food will vanish.

Once the scale and utilization rates decay, industrial agriculture will no longer be viable economically or environmentally.

In other words, industrial agriculture simply isn't sustainable. It's not a theory or a forecast, it's an observation. What most view as "impossible"—the end of cheap food-- is inevitable.

As industrial agriculture decays, food will become much more expensive. Even if it doubles in price, it will still be cheap compared to what it may cost in the future.

Few appreciate the potential productivity of artisanal food production optimized for its terroir. Small operations growing what fits the soil and climate can produce a surprising amount of food: *grow what grows easily*.

TV cooking programs excel at dramatic contests between chefs and the creation of elaborate dishes, but they fail to communicate the difference in taste and nutrition between factory-farmed and local produce.

The future of sustainable, affordable, nutritious food is in localized production optimized for what grows well where we live.

The satisfaction and well-being this connection with the land generates is rarely appreciated. It is not coincidental that the longest-living, healthiest groups among us—for example, the *Blue Zones* Okinawans and the Greek islanders—tend their plots of earth and their animals, and share their homegrown bounty with their families, friends and neighbors.

They enjoy a long, fulfilling life because they are productive within a small-scale, caring, sharing community—the essence of self-reliance.

Cheap Energy, Specialization and Economies of Scale

As noted earlier, our economy is optimized for specialization. We go to specialists for healthcare, auto repairs, accounting and other services. Our products are manufactured in specialized factories and shipped thousands of miles in specialized supply chains.

But the real driver of wealth over the past 200 years is cheap energy. Ever more abundant energy was a rocket-booster to specialization, transportation and the global trade of goods.

As noted previously, the easy-to-get, low-cost energy has now been extracted, and regardless of the source, energy will become increasingly costly. A great many people believe that technology will create a limitless source of low-cost energy, but these dreams ignore the limits of physics and real-world costs.

As energy become scarce and costly, economies that can only function if energy is cheap break down.

Manufacturing, transportation and trade that is only profitable if tens of millions of people buy the products and services are no longer viable. Consider the toaster. It only costs \$25 because all its components are manufactured in vast quantities. As noted earlier, the cost per unit can be very low because the initial investment in production lines and the wages paid to workers are spread over a million units.

Were the factory only able to sell 1,000 units, the cost per unit would be astronomical because the initial investment is so large

The vast majority of modern goods cannot be economically manufactured on a small scale. Thomas Thwaites attempted to make a toaster from scratch and found it was impossible to do so. He described the experience in his book, *The Toaster Project: Or a Heroic Attempt to Build a Simple Electric Appliance from Scratch*. Even the simple kitchen toaster requires highly specialized ceramics and metals that are only fabricated in a few factories.

In many cases, a handful of factories produce the entire world's supply of specialty components, solvents, etc. It simply isn't economical to produce these highly specialized components on any scale less than global.

To reduce costs, global supply chains have been streamlined down to a handful of suppliers who mass-produce products. If one component—for example, a specialty semiconductor chip—is no longer available, the entire production line is shut down.

If the products are no longer affordable to a vast number of consumers, the product line will also be shut down because it's not financially viable to operate at less than mass production.

This is why products will become increasingly unavailable. Higher costs will put products out of reach of the vast number of consumers necessary to keep economies of scale profitable. Manufacturers will shut down because they are unable to earn a profit producing fewer units, even if they raise prices. The higher the price, the fewer consumers can afford it.

If a factory only makes 1,000 toasters a year, relatively few consumers could afford the high cost of production.

Energy moves global trade, and if transportation costs rise due to higher energy costs, it has the same effect: global supply chains are only financially viable if they are moving vast quantities of goods and materials.

The same is also true in labor markets. Specialization is only profitable if a large number of consumers can afford the service. Consider a hospital with many specialist physicians and nurses. A hospital is extremely expensive to operate, and so a small population of patients can't support numerous specialists.

As economies optimized for specialization and cheap energy unravel, the economies of scale necessary to support labor specialization also unravel. As the number of jobs declines, so does the pool of consumers who can afford higher costs for products and services.

The mechanic who once had enough customers to specialize in one brand of vehicle may find there are no longer enough customers with enough money to pay specialized rates. They will have to learn how to service more types of vehicles and reduce their hourly rate to attract enough customers to support her enterprise.

In other words, specialization is only profitable if there are enormous economies of scale and millions of consumers who can afford the products. Once the pool of consumers who can afford higher prices shrinks, mass production is no longer economically viable and production shuts down.

Complexity and Dependency Chains

The complexity of modern goods is another source of system fragility. If an electronic controller fails, the device stops working. The only way to fix it is to replace the failed controller with the exact same part—there are no substitutes.

A few years ago, the controller board on our clothes dryer failed, and there was only one source: the manufacturer. The replacement controller board was about 1/4th the cost of a new dryer. Sole-source suppliers are monopolies, so they can charge whatever the market will bear. The controller boards for other brands and models won't work; you need the exact same part.

This is true of vehicles, appliances and virtually every other product with electronic components. Many products rely on sensors to function. If a single sensor fails, the product stops working. If a replacement sensor is unavailable, the product can't be repaired.

The point is that a scarcity of replacement parts means that products that fail cannot be repaired, or the repair may be extraordinarily costly.

Many essential machines require special solvents and fluids. If these are unavailable, the machines grind to a halt. For example, if Diesel Exhaust Fluid (DEF) is unavailable, sensors limit diesel vehicles to a top speed of 5 miles per hour.

Institutions are also complex. If one essential process fails, the institution breaks down.

The institutions we rely on for water, food, energy, education, etc., are also dependent on economies of scale. They are like the visible peak of an iceberg above the waterline: they depend on a vast infrastructure that's invisible to most of us. As energy costs and resource scarcities melt away global economies of scale, institutions cease to function.

We're learning that scarcities can occur for many reasons: depletion, geopolitical tensions, supply chain logjams and so on.

All of these production and distribution systems are *dependency chains*: if one link in the chain breaks, the entire system grinds to a halt.

In effect, the systems we depend on are *designed to fail* in anything less than global abundance delivered by long, complex dependency chains. These systems are designed to fail because every link is a potential point of failure that can bring down the entire chain. Our global system of abundance is inherently fragile.

There are additional layers of fragility on top of scarcities and long dependency chains: the financial and Internet systems that process the billions of transactions that keep the global system of production and distribution functioning. Each of these systems has its own vulnerabilities: failures in one node can cascade, bringing down the entire system.

Scarcity, Fragility and Technological Constraints

Humans are prone to *recency bias*: we believe that the recent past is a reliable guide to the future. The past 75 years of abundance, stability and reliable weather have lulled us into thinking that abundance, stability and good weather are permanent. We are learning these were all temporary. Though we pride ourselves on our technologies, humanity still depends on rain and soil for the majority of our food. Our technology and financial wealth cannot make unreliable weather reliable again or restore depleted aquifers and soil on a global scale.

Cheap energy, specialization and economies of scale were all optimized to expand consumption and profits. Localized production was replaced by highly profitable offshoring of production. Now the global system has been optimized to function only if energy is cheap, materials are abundant and specialized chains of production and distribution work perfectly.

We don't have to run out of energy or grain to experience crisis; anything that breaks key links in our long supply chains will disrupt the distribution of life's essentials. Grain may be in the field and oil still in the ground, but if a few links in the long supply chains break, there will be little food or fuel delivered to cities thousands of miles from the farms and oil wells.

Governments have awakened to the national security risks of dependence on foreign suppliers, and the potential for geopolitical blackmail, supply chain breakdowns and scarcities. My book on these topics is titled *Global Crisis, National Renewal* because I see a once-in-a-lifetime opportunity for national renewal in reshoring production and embracing Degrowth: *doing more with less*.

Shortening supply chains from 5,000 miles (global) to 1,500 miles (domestic) would be an advance, but 1,500-mile-long supply chains still require complex logistics and massive consumption of energy. The number of links in the dependency chains are reduced, but the vulnerabilities remain: the failure of one link still breaks the chain.

Reshoring production requires enormous investments. These will increase the costs of virtually everything. Some essentials (for example, cobalt) cannot be fully supplied domestically. The economy will still be constrained by global scarcities.

Restoring the material security of the nation will take time. There are no guarantees that scarcities can be overcome. Depletion is real and there are no substitutes for many materials.

Our modern bias is to trust technology to deliver solutions which don't require any sacrifice. We cheer all-electric pickup trucks and the successful flights of electric air taxis. When told these solutions aren't scalable due to scarcities of the materials needed to manufacture them, we insist technology will find a way. But technology isn't magic. Every technology needs materials and energy. If these are scarce and costly, technology has real-world constraints.

What happens when supply chains unravel and institutions break down? We're helpless. Most of us have few if any real-world skills and few if any personal networks built on reciprocity, trust and producing the essentials of life. Those without a foundation of self-reliance will find life much harder than those who have assembled a self-reliant way of living.

While we can hope that technology will conjure up new sources of materials and energy, it is prudent to recognize physical and financial constraints and plan accordingly. This is the heart of self-reliance: rather than count on a future techno-miracle to save us, find solutions that are within our grasp now.

The Profound Consequences of Globalization and Its Demise

Has anyone been unaffected by the hyper-globalization of the past 40 years? The answer is no. You may think *hyper-globalization* is an exaggeration, but consider that 40 years ago, not a single item in the hardware store was made in China. Now, virtually every item in the hardware store is manufactured in China. That's not merely globalization, it's hyper-globalization—near-total dependence on other nations for goods and commodities.

Consider that when the Covid pandemic hit the U.S. in 2020, there were immediate shortages of N95 masks and the precursor materials for pharmaceuticals, as the production of these (and thousands of other products) had been offshored to China to increase American corporate profits by reducing costs.

As the pandemic disrupted deliveries from Asia, U.S. auto manufacturers could not finish the assembly of vehicles due to severe shortages of semiconductors.

The consequences of hyper-globalization have not been limited to soaring corporate profits and cheaply made goods. Entire sectors of the U.S. economy have disappeared, along with hundreds of thousands of jobs. Cities that were once hubs of manufacturing and valued-added production now rely on finance, tourism, entertainment and real estate speculation for jobs and tax revenues. Meanwhile, the essential goods and commodities that support these services come from countries whose production and supply chains we don't control.

Hyper-globalization certainly boosted U.S. corporate profits, but the downside is the vulnerabilities created by relying so heavily on other nations. This dependence gives those

nations the power to disrupt our economy, either as a consequence of their domestic policies—for example, China shutting down production to limit the spread of Covid—or as a way to influence our geopolitical decisions via blackmail: either support the “right” policies or suffer the consequences of being cut off from essentials.

Globalization is unraveling in real time for reasons that cannot be reversed. Every nation that depends on globalization realizes that it cuts both ways: hyper-globalization boosts exports and profits but creates vulnerabilities by giving others the power to disrupt or even cripple our economy.

Hyper-globalization has hollowed out our economy, replacing production with services and speculation, neither of which provide the material necessities of life. Financial speculation (*hyper-financialization*) has become the way to make fortunes rather than creating useful products and jobs. This dependence on speculation is not healthy, as all speculative bubbles eventually deflate, with devastating consequences.

All the low-hanging fruit of reducing costs by offshoring production has been picked, and now costs are rising regardless of where production is shipped: wages are rising globally, environmental damage must be mitigated, and depletion is causing commodity scarcities that push prices higher. Globalization is no longer a solution; it is the problem.

Will anyone be left unaffected as globalization unravels? Just as no one was left unaffected by the rise of hyper-globalization, no one will be left unaffected by its demise. On both the household and national levels, the only response that reduces our vulnerability is self-reliance.

Chapter Two: The Mindset of Self-Reliance

The Goal of Self Reliance

The goal of self-reliance is to improve well-being, security and productivity by optimizing practical skills, flexibility, trusted personal networks and what author Nassim Taleb termed *antifragility* (not just surviving adversity but emerging stronger). The purpose of increasing self-reliance is to navigate the unprecedented transition from excess consumption to securing essentials. This goal demands we avoid becoming attached to anything other than self-reliance.

Chapter Two examines the Mindset of Self-Reliance (19 sections).

Chapter Three covers the Nuts and Bolts of Self-Reliance (18 sections).

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