The Four Drivers of Planetary Change

A long-form essay on the systemic forces shaping ecological overshoot, inequality, and human wellbeing

The crises we face are not failures of knowledge, but failures of perception

By Michael Chèze

Contents

Introduction: Going Beyond Limits

Human beings have always tested boundaries. Our ingenuity has allowed us to thrive in deserts, sail across oceans, and gaze into the depths of space. Yet that same ingenuity, so vital to survival, now lies at the heart of our planetary crisis.

We live in an age where climate disruption, biodiversity loss, rising inequality, and social fragmentation converge into a single, systemic emergency. These are not separate issues. They are symptoms of deeper structural forces.

At first glance, it seems almost magical that small, fragile creatures like us could have such an outsized impact on Earth's vast and complex systems. How do we — without the strength of lions or the grace of dolphins — manage to reshape the world's climate, poison rivers, and unravel the fabric of life? The answer is unsettling: we have constructed social, economic, and technological systems that multiply our power far beyond natural limits.

This Manifesto offers a **deep structural diagnosis**. It identifies four systemic drivers that, together, lock humanity into ecological overshoot and social breakdown:

1. **Debt-Based Money** — a monetary system that demands endless growth.
2. **Industrial Logics** — our use of machines, fossil fuels, and corporate structures that convert living ecosystems into commodities.
3. **Engineered Consumption** — cultural systems that manufacture demand to absorb industrial output.
4. **Governance for Growth** — states that legitimise and reinforce the extractive model.

These drivers are not isolated. They form a **self-reinforcing cycle**, each feeding the others, trapping us on a path to oblivion.

Yet the story does not end with diagnosis. We can change direction. Just as these systems were built by human design, they can be reimagined. To do so requires more than technical fixes: it demands that we confront the beliefs that underpin the drivers and adopt new values rooted in stewardship, reciprocity, and humility.

"Humanity created these systems. Thus, we can change them. Our ingenuity must now be used to serve life, not just profit."

Part I: The Four Systemic Drivers

Driver 1: Debt-Based Money

The Expansionary Engine of Modern Economies

Money is not simply a neutral unit of exchange, as economics textbooks would have it. In practice, money represents the ability to effect change in the world. It is a catalyst, an amplifier. If a man stands before a forest alone, his ability to change it is limited. He may cut down one or two trees. If he can coerce others through slavery or inspire them through volunteering, his reach expands. But if he can pay them, his impact multiplies. With money, he can hire workers, purchase machines, and strip the forest in days. Money mobilises human and mechanical power on a scale far beyond individual capacity.

This is why the drivers of money supply expansion matter so profoundly. The more money that exists, the greater humanity's capacity to transform — and often to degrade — the living systems of the Earth.

Debt-Based Creation and the Growth Imperative

Most of us rarely think about where money comes from. We are often told that governments "print money" but that is only a very small part of the story. In fact, the greatest portion of money in circulation in the modern economy is created not by the government or central bank - but by commercial banks when they make loans.

Every time you take out a mortgage, a car loan, or a business loan, you bank doesn't hand you someone else's money. It creates new money by typing it into your account. This money didn't exist before.

"Whenever a bank makes a loan, it simultaneously creates a matching deposit in the borrowers bank account, thereby creating new money"

- Bank of England Quarterly Bulletin 2014 Q1

In the United Kingdom, for example, approximately 95% of the of the money supply is created by commercial banks via lending. Only 5% or less is created by the central bank in the form of physical cash or reserves.

This system of money creation has several profound implications:

- The creation of money is largely in the control of commercial interests, not governments
- This money is created as debt; it will have to be repaid from the future earnings of the borrower. The borrower is, in effect, mortgaging the future to pay for the present.
- When a bank lends, new money enters the system; when the loan is repaid, it is destroyed. But loans must be repaid with interest. The interest component cannot be settled unless additional money is created somewhere else in the economy. This structure locks us into perpetual expansion: growth is not optional, it is demanded by the very architecture of money.

"Every loan creates the need for more loans. Growth is not a choice — it is built into money itself."

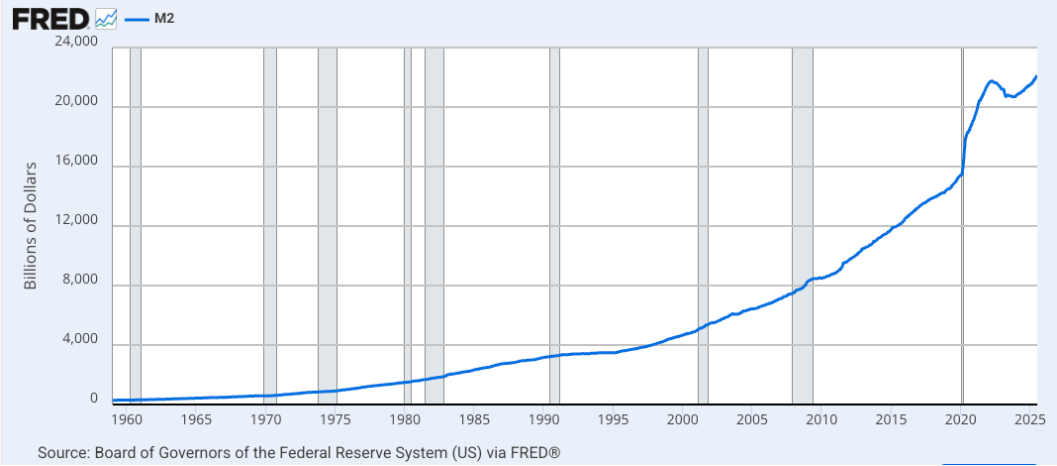
The Decoupling from Gold

Under the classical gold standard (roughly 1870-1914, and in modified forms until the 1970s), the amount of money in circulation was tied to a country's gold reserves. Central banks could only issue currency if it was backed by gold at a fixed rate. This limited governments and banks from freely creating money, since expanding the money supply required acquiring more gold.

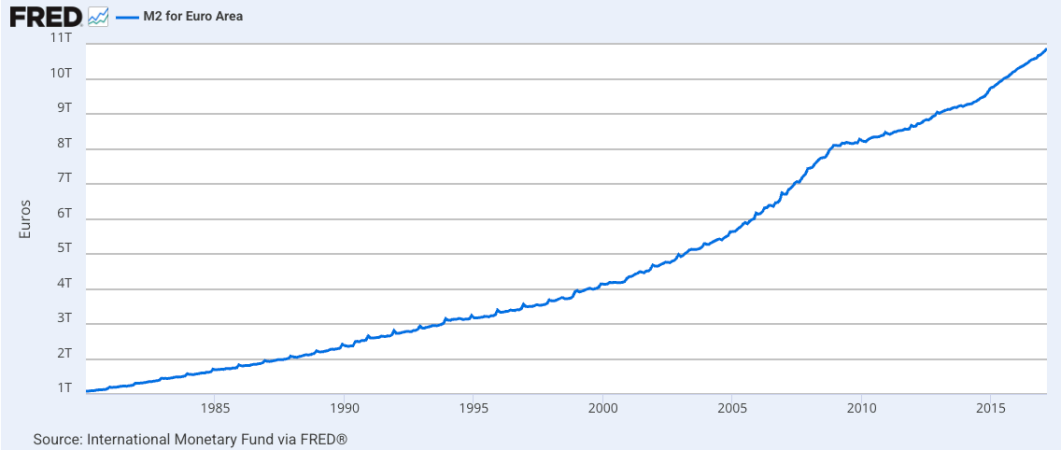
That tether was severed in 1971, when the collapse of the Bretton Woods system (the so-called "Nixon Shock") removed the dollar's link to gold and, by extension, unmoored global currencies from any physical anchor. From then on, money creation was constrained only by the willingness of banks to lend and borrowers to borrow.

The result: an exponential surge in global money supply and credit, financing both production and consumption on unprecedented scales.

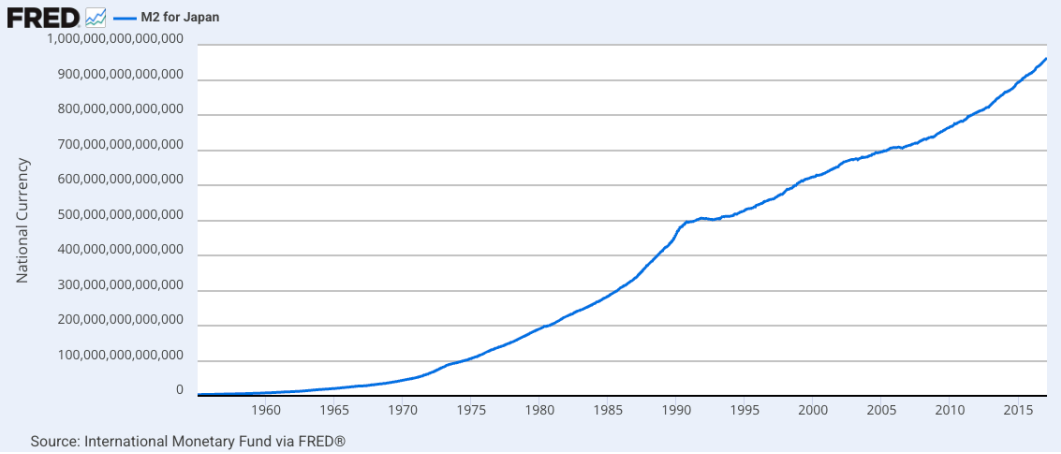
Expansion of the money supply (United States)



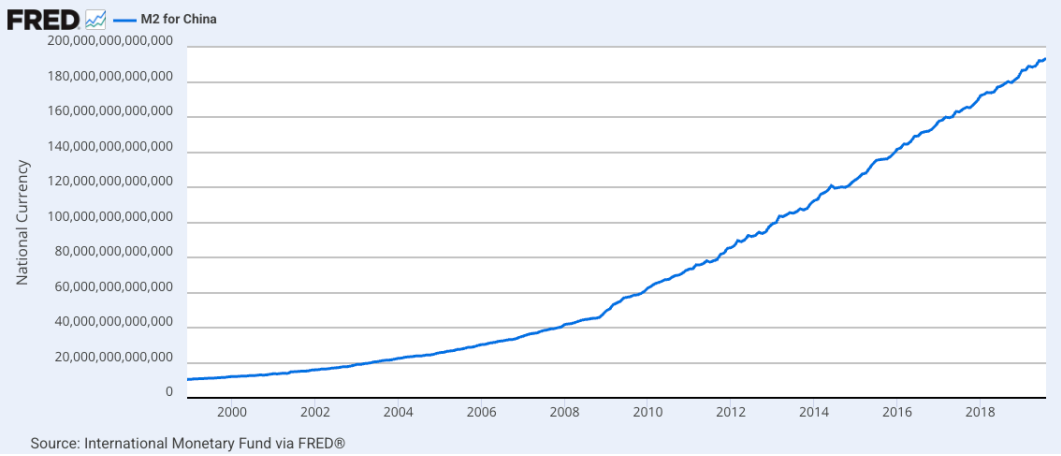
Expansion of the Money Supply (Eurozone



Expansion of the Money Supply (Japan)



Expansion of the Money Supply (China)



Source of charts: US Federal Reserve

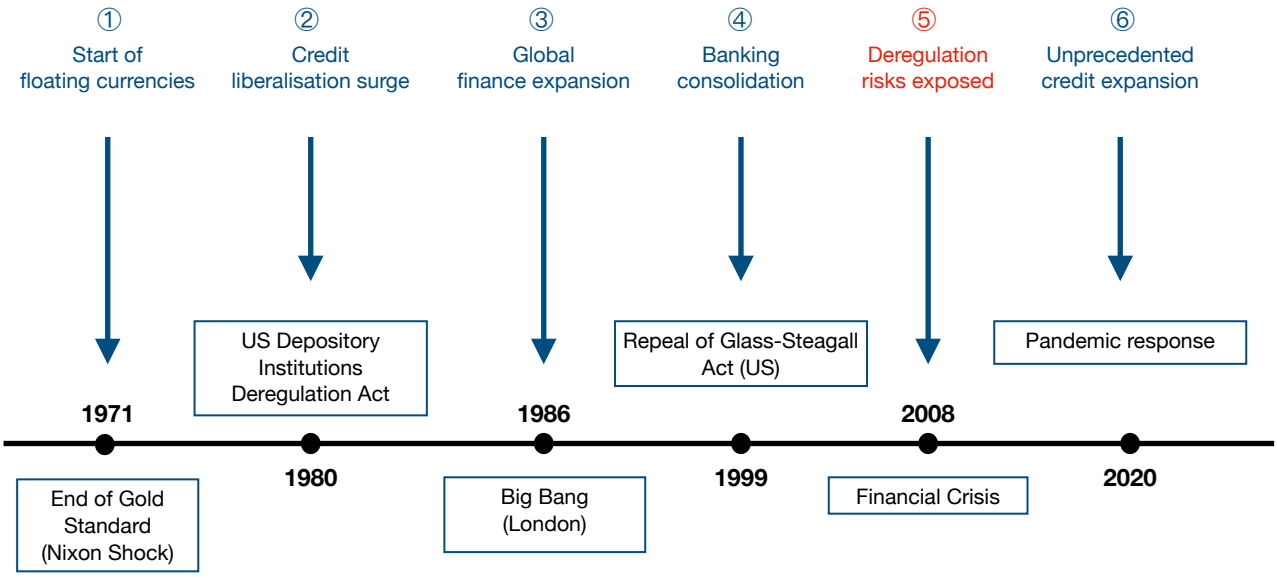
Deregulation: Fuel for Expansion

From the 1980s onwards, financial deregulation — strongly influenced by the economist Milton Friedman and the Chicago School of Economics — dismantled many of the restraints on money creation.

- The repeal of the Glass-Steagall Act in the US allowed commercial banks to merge with investment banks, vastly expanding speculative activity.
- Relaxed capital requirements permitted banks to lend more against thinner reserves.
- Financial innovations — derivatives, securitisation, and complex debt instruments — multiplied credit beyond traditional banking.

Corporations and financial institutions lobbied governments to loosen rules further, arguing for efficiency and free markets. Just as the profit motive drives producers to expand, it also drives financiers to create ever more credit. Deregulation transformed finance into a growth machine, decoupling it from prudence and long-term stability.

Deregulation: Fuel for Expansion
Major Milestones



① The U.S. breaks the link between the dollar and gold, allowing currencies to float freely. This marks the start of unlimited credit expansion untethered from a physical anchor.

② Act removes interest rate caps on deposits and expands lending freedom for banks, fueling a surge in consumer credit and financial product innovation.

③ Sweeping deregulation transforms the City of London into a global finance hub. Barriers between different types of financial services are dismantled, enabling rapid growth of capital markets.

④ Commercial and investment banking are remerged, allowing banks to grow into 'too big to fail' conglomerates and vastly expanding speculative activity.

⑤ Decades of deregulation culminate is systemic collapse. Excessive leverage, complex derivatives, and weak oversight expose the risks of an unchecked financial system.

⑥ Governments and central banks inject unprecedented liquidity through stimulus and quantitative easing. This highlights how deregulation has created a system reliant on credit expansion to manage crises.

Digitisation: Frictionless Money

At the same time, digitisation revolutionised money creation. No longer tied to paper and coinage, credit could now be created by keystroke. Money became data, an entry in a database. Digital technologies accelerated the velocity of money and expanded its reach.

Digitisation also gave rise to cryptocurrencies, creating parallel streams of financial activity outside traditional banking. Though small compared to mainstream credit creation, cryptocurrencies contribute to the expansion of money-like assets circulating in the economy.

Digital payment systems, online trading, and algorithmic platforms further amplified financialisation, making money creation and movement instantaneous, global, and virtually limitless.

"Money no longer needs paper or metal — only a keystroke."

Central Banks: Guardians or Enablers?

Central banks attempt to influence the money supply through interest rates and inflation targeting. By raising rates, they cool lending; by lowering them, they encourage expansion. They also act to preserve currency value and financial stability.

However, there is a critical nuance: inflation only rises if the growth in the money supply outpaces the value of goods and services produced. If industrial output grows rapidly, money can expand without sparking inflation. In practice, this means that industrial expansion legitimises monetary expansion. Far from restraining growth, central banks often accommodate it.

The obsession with GDP reinforces this logic. As long as economies keep producing more, central banks tolerate — and often encourage — rising money supply.

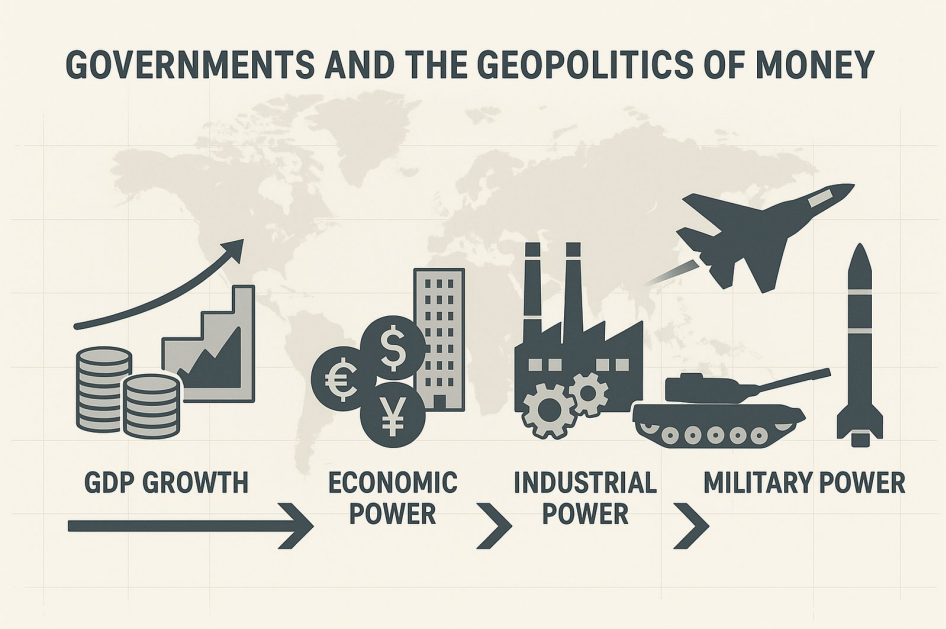
"Inflation is no brake if output keeps pace. Money expands as industry expands."

Governments and the Geopolitics of Money

For governments, economic growth is not merely about prosperity. GDP growth is more than a measure of economic activity — it is a driver of geopolitical power. As nations expand their GDP, they gain greater economic leverage through trade and finance. This fuels industrial power, as larger economies invest in production capacity, infrastructure, and technology. Ultimately, these resources flow into military strength: the capacity to project force, secure resources, and influence global affairs.

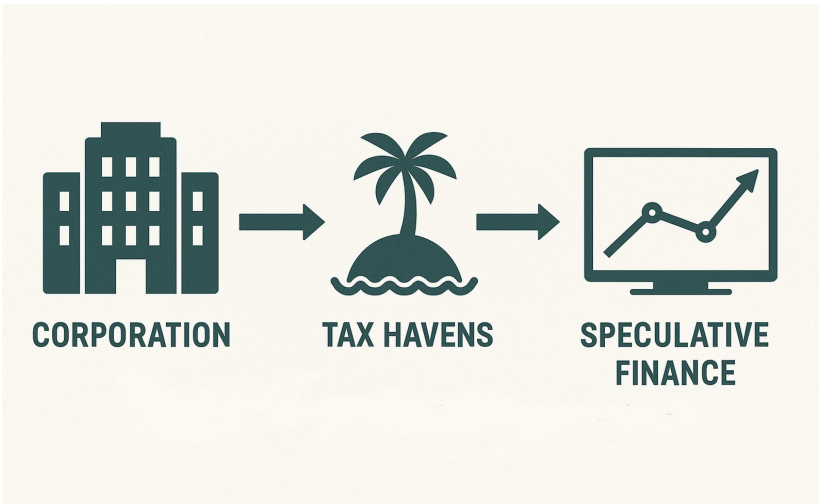
This geopolitical competition creates yet another imperative to expand the money supply. Leaders pressure central banks to maintain low interest rates and stimulate credit. In the United States, President Trump recently berated the Federal Reserve for not lowering rates fast enough to accelerate growth. Similar pressures are visible in China and Russia, where state power and

industrial expansion are tightly bound. This cycle reinforces the link between money, power and security - with profound implications for global stability and planetary health.



Taxation, Incentives, and Loopholes

Corporate lobbying has also ensured that taxation plays a role in expanding the money supply. Lower taxes and generous incentives leave more liquidity in circulation, often directed toward speculative investment. The use of tax havens allows corporations and elites to recycle capital, amplifying the expansion of money-like instruments beyond national oversight.



The Abstraction of Money: A Limitless Machine

Over the last century, money has shed its anchors. No longer tied to gold or silver, it floats free — an abstraction that can be created in potentially limitless quantities. This abstraction is humanity's

most powerful invention. It has become a universal enabler of change: the same money tree finances wars and weapons, funds hospitals and vaccines, destroys forests, builds cities, and fuels scientific breakthroughs.

In principle, money is neutral. It is neither good nor evil. It is a tool — a representation of possibility. But neutrality ends at the level of structure. The design of our monetary system places the power of money creation largely in the hands of private enterprises — commercial banks and financial institutions — whose overriding imperative is profit.

Thus, while money could in theory be directed toward regeneration, its expansion is overwhelmingly tied to commercial imperatives: industrial expansion, speculative finance, and extractive growth. The money tree exists, but it is cultivated in private orchards, its fruits harvested for private gain while its costs — ecological destruction, inequality, and instability — are borne by the many.

"Money has become an abstraction — limitless, powerful, and in service of profit."

The Expansionary Logic Summarised

The growth of the money supply is not accidental. It is driven by a constellation of structural imperatives:

- Debt and interest require perpetual creation of new money.
- Decoupling from gold removed natural constraints.
- Deregulation opened the floodgates to financial innovation and speculation.
- Digitisation made money creation frictionless and global.
- Central banks accommodate industrial expansion.
- Governments pursue monetary growth for geopolitical power.
- Tax regimes favour liquidity and financial accumulation.

Each of these factors adds fuel to the fire of expansion. Together, they ensure that the global money supply grows relentlessly, financing ever more industrialisation, consumption, and ecological overshoot

The Invisible Multiplier of Money's Impact

As dramatic and consequential as the increase in the measured money supply has been, it represents only a fraction of the planetary impact that has been caused since the 1970s by modern money creation. To understand the real impact, we must look at the difference between stock and flow.

When we speak of the *money supply*, we usually mean the stock of money that exists at a single point in time. It is a snapshot, like a photograph taken of the river at one instant. But modern money is not static; it is created and destroyed continually by commercial banks. Every new loan generates fresh money, and every repayment extinguishes it.

This dynamic means that the cumulative amount of money that has flowed through the system—and shaped human activity—is vastly greater than the official measure of the money supply. Each loan leaves its imprint: forests cut for timber, factories built, wars financed, technologies launched, houses constructed, and lifestyles expanded. When the debt is repaid, the money disappears from the system, but the effects remain embedded in the world.

Over decades, the flow of credit has financed transformations on a scale that dwarfs even the present stock of circulating money. The money supply, as dramatic as it is, shows us what remains today, but it hides the far greater river of credit that has coursed through society, leaving behind altered landscapes, infrastructure, and social arrangements. In this sense, the true impact of money is a great multiple of what we measure at any given moment.

This distinction between *stock* and *flow* is critical. To focus only on the current money supply is to mistake the shadow for the substance. The real story is the constant creation and destruction of money—and the irreversible imprint it leaves on both people and planet.

"The money supply is only the shadow. The real story is the vast river of credit that has already reshaped the world."

Key Insight

Money is not neutral. It is the prime mover of modern civilisation's expansion, the enabler of our capacity to transform nature at planetary scale. The structural drivers of money supply growth are, in effect, the structural drivers of ecological crisis.

"Money is the most powerful machine we have built. It multiplies our capacity to change the world — and locks us into perpetual expansion."

Driver 2: Industrial Logics of Machines and Scale

From Cottage Industry to the Anthropocene

If money is the bloodstream of the modern economy, then machines are its muscles. The invention of industrial machinery did more than increase productivity; it fundamentally altered humanity's relationship with the natural world. It forever changed the relationship between effort and output. For the first time, we could exceed the limits of human and animal power.

The Machine as Master Metaphor

Before the Industrial Revolution, production was largely local and organic. Tools amplified human effort, but nature provided the power: watermills, windmills, animal labour. With the advent of steam engines, internal combustion, and electricity, machines no longer depended on natural rhythms. They relied instead on fossil fuels — ancient energy stored beneath the Earth's crust.

This ushered in a new era: the **Anthropocene**, where humanity itself became a geological force. Machines reorganised society around factories and cities, redefined progress in material terms, and entrenched the idea that human destiny was to expand, extract, and transform.

One of the defining features of modern industrial civilisation is the relentless expansion of productive capacity. Since the Industrial Revolution, humans have developed increasingly powerful tools - steam engines, assembly lines, fossil-fuel-based transport, robotic automation, and digital platforms - to extract, process and manufacture natural resources into finished goods and services at unprecedented speed and scale.

The machine also became the dominant metaphor in our societies. Whereas before, nature was seen as the pre-eminent organising principle in the world, with the coming of the machine, mechanical efficiency and industrial modes of organisation became predominant.

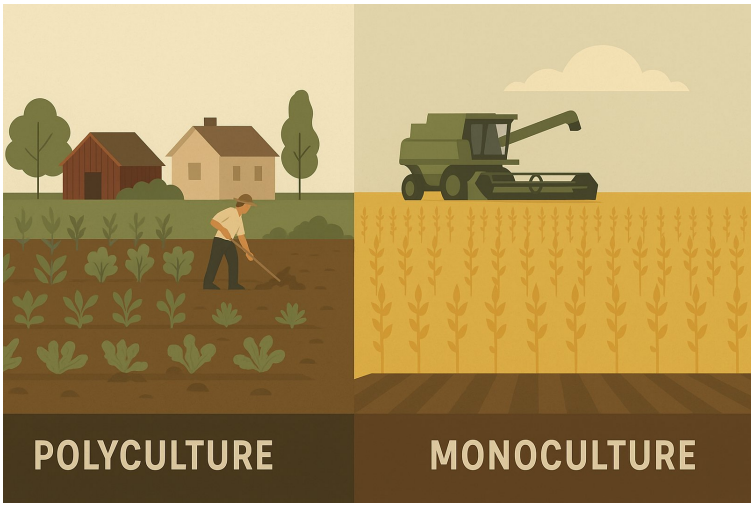
Industrial Agriculture: Playing God with Nature

The machine metaphor extended into the food system. Agriculture, once based on cycles of soil, seasons, and sun, became industrialised.

- **Mechanisation**: Tractors and harvesters replaced manual labour.
- **Monocultures**: Single crops replaced biodiverse landscapes, eroding soil and resilience.
- **Chemical Inputs**: Synthetic fertilisers and pesticides replaced natural fertility and pest control.
- **Biological Manipulation**: Genetic engineering altered plants and animals for profit-driven efficiency.

Case Example: In the poultry industry, chickens are bred to lay eggs year-round under artificial light, their natural rhythms suppressed to maximise yield. The connection between animals and the land is severed: they are fed imported grains while confined in cages, their bodies engineered for faster growth and fatter meat.

Industrial agriculture treats living systems as machine parts. Animals become protein units; soil becomes a substrate for chemical inputs; forests become obstacles to clear. The result is high yields in the short term, but long-term fragility: soil depletion, water scarcity, greenhouse gas emissions, and the collapse of rural communities.



Synthetic Substances: Poison in the System

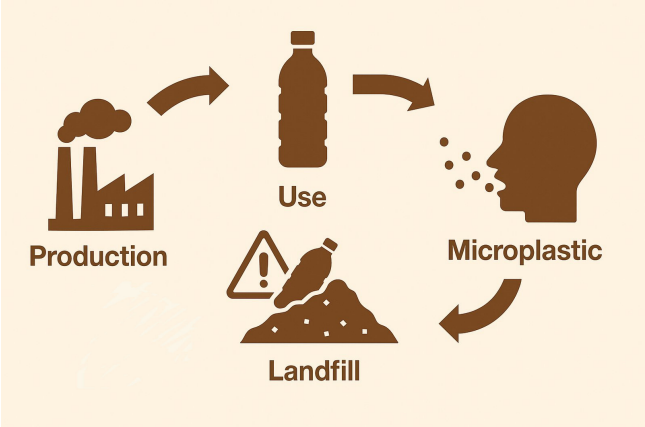
The 20th century introduced a new industrial dimension: synthetic chemistry. Plastics, pesticides, and industrial chemicals offered miraculous possibilities — lightweight packaging, abundant food, durable materials. But they also introduced substances alien to the biosphere, substances that nature cannot recycle.

- **Persistent pollutants** such as DDT and PCBs accumulate in ecosystems, disrupting reproduction in wildlife.
- **Plastics** fragment into microplastics, now found in the bloodstreams of humans and animals alike.
- **PFAS "forever chemicals"** do not degrade, contaminating water sources for centuries.

Case Example:

A 2023 study found PFAS in rainwater across the globe, including remote regions of Antarctica. Even the most isolated ecosystems are now touched by synthetic chemistry.

Synthetic substances represent a profound break with natural cycles. Unlike organic materials, they do not decompose or integrate. They persist, poisoning ecosystems and bodies, generation after generation



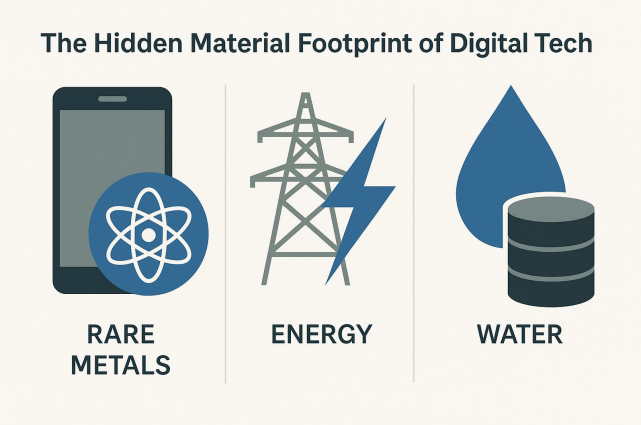
Digitisation: The Virtual Accelerator

The digital revolution brought a different kind of machinery: machines of information. At first, digitisation seemed immaterial, a way to reduce reliance on physical goods. But it has added a new layer of artificiality and acceleration to industrial logics.

- **Representation**: Digital platforms mediate experience, offering images and simulations instead of direct encounters.
- **Acceleration**: Data analysis, algorithms, and automated systems vastly increase the speed of industrial processes.
- **Consumption**: Smartphones, streaming, and social media expand consumption into every corner of life.
- **Disconnection**: The world is increasingly experienced through screens rather than direct contact with ecosystems.

Case Example: Social media algorithms are optimised to capture attention for advertising revenue. This industrialisation of the psyche is no less extractive than mining — only now the raw material is human attention.

Digitisation does not replace the material world. It intensifies it. The cloud is powered by coal plants and data centres; the smartphone requires rare earth metals mined under harsh conditions.



Corporate Power: The Legal Engine of Industry

One of the pivotal legal innovations that enabled industrial expansion was the recognition of the corporation as a "person" under the law. This doctrine of corporate personhood grants companies many of the rights enjoyed by individuals — the ability to own property, sign contracts, and even influence politics — while shielding their owners and managers from personal liability.

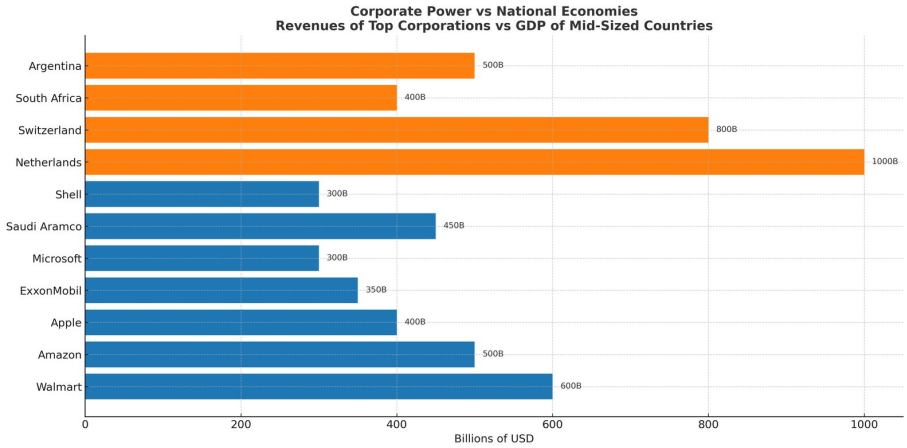
Unlike real people, corporations do not die, have no natural limits to growth, and are designed to maximise shareholder returns. They can externalise costs such as pollution, habitat destruction, and social harm without bearing the full consequences. The result is an entity with extraordinary power to reshape the world, yet without equivalent responsibilities to society or the planet.

By granting rights without corresponding obligations, corporate personhood created a legal and economic engine for industry. It allowed corporations to scale, accumulate wealth, and concentrate influence, while remaining structurally insulated from the ecological and social impacts of their actions.

Case Example:

ExxonMobil conducted internal climate research in the 1970s that accurately predicted global warming. Instead of acting, it funded denial campaigns to protect profits.

The corporation, hailed as an engine of prosperity, has also become an engine of ecological overshoot and inequality.



Key Insight: Industrial Logics Exceed Natural Limits

Machines, industrial agriculture, synthetic substances, digitisation, and corporations share a common trait: they enable humanity to go beyond natural limits. Yet what seemed like liberation has become entrapment. Natural cycles that took millennia to evolve are consumed in seconds. Living systems that once sustained abundance are converted into commodities, degraded, and discarded.

"The machine has given us immense power. But in giving us the ability to go beyond natural limits, it has unmoored us from a world in balance."

Driver 3: Engineered Consumption

The Manufacture of Desire

If debt-based money creates the imperative for growth, and industrial logics create the capacity for production, then consumption is the third piece of the puzzle: the absorption mechanism. It is not enough to produce endlessly; people must be persuaded to consume endlessly.

Our ever-increasing productive capacity has long outstripped our genuine needs. To bridge this gap, demand had to be engineered. Consumption, far from being natural, is a cultural construction, meticulously shaped by advertising, design, and psychology.

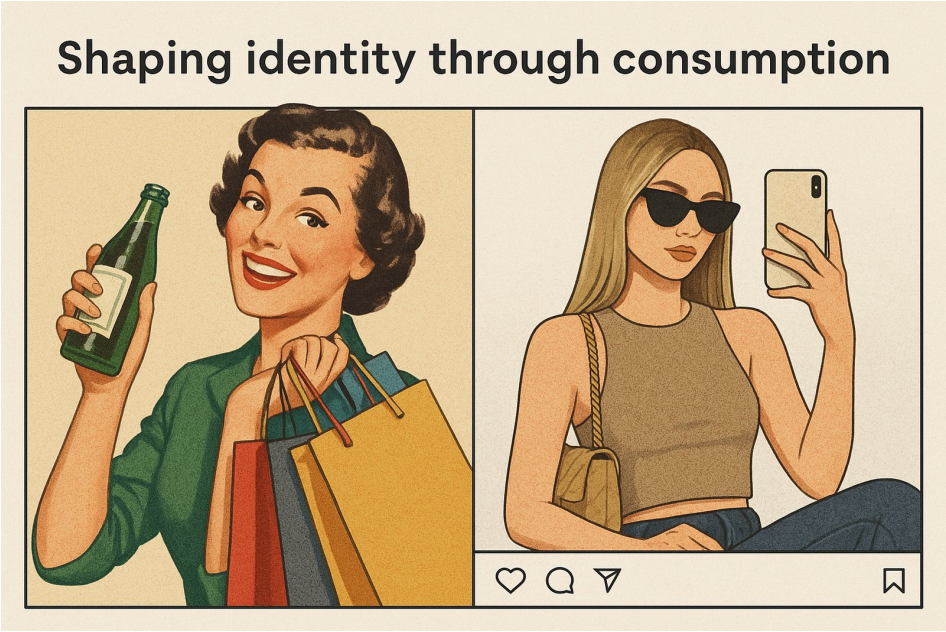
From Thrift to Consumerism

At the dawn of the 19th century, most people lived on the land and had an ethos of thrift. Scarcity, uncertain harvests, and the absence of credit reinforced a culture of saving and careful use.

This worldview was incompatible with industrial expansion. Factories could churn out goods faster than they could be consumed. A new mindset was required: one that would normalise waste, glorify novelty, and equate identity with what one owned.

Edward Bernays, nephew of Sigmund Freud, pioneered this shift in the early 20th century. By blending psychoanalysis with marketing, he discovered ways to manipulate unconscious desires. Cigarettes were sold as “torches of freedom” to women. Cars became symbols of masculinity and independence. Products ceased to be functional objects; they became carriers of meaning.

Advertising was not just about informing people of products. It was about **manufacturing consent** for a consumer identity.



Behind the Curtain

The consumer spectacle operates like a magic trick. The shopfront glitters; the advertising sparkles with promises of joy and freedom. Behind the curtain lies the sweatshop, the abattoir, the oil rig.

- **Supermarkets** display idyllic images of cows grazing on green pastures, masking the reality of industrial feedlots.
- **Fast fashion brands** showcase glossy runway looks, concealing exploitative labour conditions in garment factories.
- **Electronics retailers** highlight sleek designs, omitting the mining of rare earths and toxic e-waste dumps.

The system relies on this separation between surface and reality. The glossy facade is necessary for consumers to keep buying without confronting the hidden costs.

Obsolescence as Strategy

Industrial systems need continual turnover. To maintain profit and growth, products must not last too long. Enter obsolescence:

- **Planned obsolescence**: designing products to fail or wear out quickly.
- **Psychological obsolescence**: convincing consumers that items are unfashionable or outdated.

Case Example:

The smartphone industry thrives on psychological obsolescence. New models are marketed annually, with marginal improvements. Perfectly functional phones are discarded because they are "last year's version."

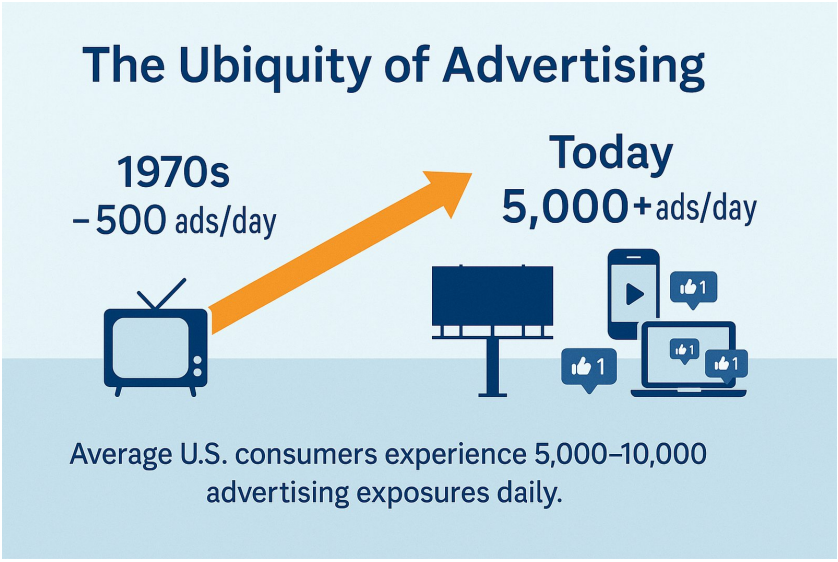
Obsolescence ensures that the treadmill never stops. Even the word "consumption," once associated with disease, has been sanitised into a badge of modern identity.

The Ubiquity of Advertising

To maintain consumption, people must be constantly nudged, reminded, persuaded. Advertising has infiltrated every available space:

- **Public space**: billboards, bus shelters, stadiums.
- **Domestic space**: television, radio, magazines.
- **Digital space**: search engines, social media, apps, streaming.
- **Intimate space**: influencers weaving product endorsements into personal narratives.

Smartphones created a 24/7 pipeline of persuasion. Algorithms optimise for attention capture, not well-being. Our very neurology is exploited — dopamine spikes engineered to keep us scrolling, watching, and buying.



Disequilibrium as a Business Model

The consumption system thrives on keeping people in a state of dissatisfaction. Equilibrium — the sense of "enough" — is the enemy of profit.

Advertising cultivates perpetual lack: you are not thin enough, not rich enough, not spiritual enough, not fashionable enough. Products are offered as temporary salves, never as solutions.

The myth of the rugged individual further entrenches this system. We are told that purchasing choices define us, that our identities are made in the marketplace. In truth, we are herded into homogeneity, bound by the same consumption logic.

Case Example:

Social media platforms normalise comparison and inadequacy. The curated lifestyles of influencers create endless aspiration — and endless consumption.

Credit as the Final Enabler

As wages stagnated in the late 20th century — pressured by automation and global outsourcing — the ability of workers to consume diminished. The system faced a dilemma: who would buy the endless output?

The solution was credit. Households were encouraged to borrow, not only for homes or cars but for daily consumption. Debt became normalised.

This arrangement creates a cruel loop: wages fall, debt rises, consumption continues, and the financial system expands. People borrow from their own futures to sustain present lifestyles, further locking society into the debt-industry-consumption cycle.

Key Insight: The Manufacture of Desire

Consumption is not an organic human behaviour scaled up. It is a cultural machine, deliberately engineered to absorb industrial output and satisfy financial imperatives.

It captures our attention, reshapes our desires, and even colonises our identities. We are not consumers by nature; we are made into consumers by design.

"Equilibrium is the enemy of profit. So we are kept perpetually off-balance — convinced that we are never enough."

Driver 4: Governance for Growth

When States Become Shareholders

Governments were created to safeguard the public good, to protect citizens, and to steward shared resources. In principle, they exist as counterweights to private interests. Yet in practice, modern states have become entangled in, and often subordinated to, the very systems driving ecological overshoot.

Instead of restraining industrial and financial expansion, governments frequently legitimise and accelerate it. This is not simply corruption or incompetence; it is structural. Political systems, like economic ones, have been reshaped by the ideology of growth.

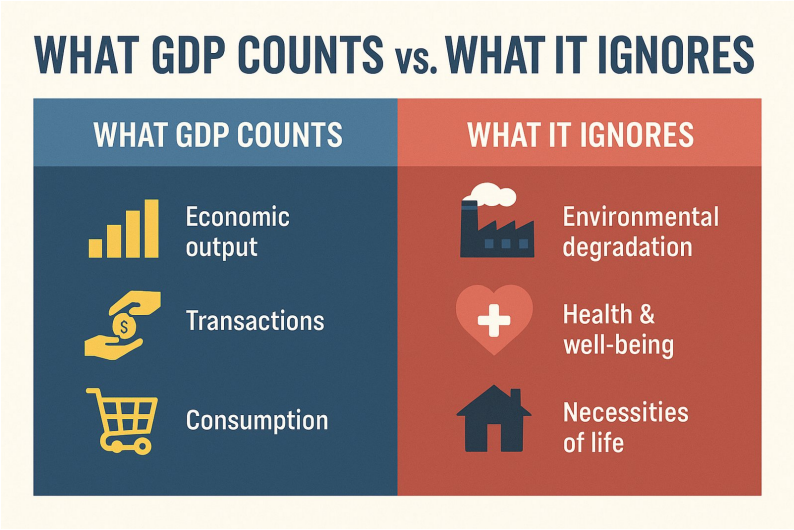
The Obsession with GDP

The 20th century elevated **Gross Domestic Product (GDP)** to the status of ultimate measure. Politicians justify policies by their effect on GDP. Journalists report GDP growth as a proxy for societal health. Citizens are told that rising GDP will improve their lives.

But GDP counts every transaction, whether beneficial or destructive. Oil spills, wars, and deforestation all increase GDP, because they generate monetary flows. What GDP does not measure is ecological resilience, social cohesion, or human flourishing.

The consequence: governments are incentivised to promote activities that expand GDP, even if they degrade the natural and social foundations of life.

"We have mistaken the speedometer for the journey itself. GDP tells us how fast we are going, not where we are headed."



Subsidising Destruction

Governments often directly fund the very industries that threaten planetary stability.

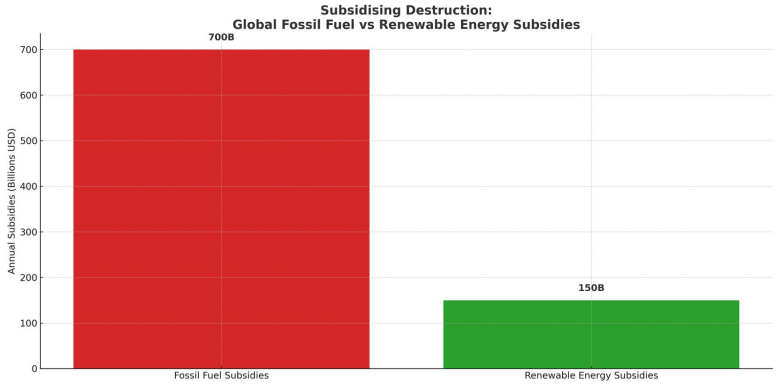
- **Fossil Fuels**: Despite global pledges to decarbonise, direct fossil fuel subsidies exceeded $1.26 trillion worldwide in 2022 (IMF Fossil Fuel Subsidies Data: 2023 Update). But that constitutes only about a fifth of the total amount, which the IMF paper estimates at $7 trillion in 2022 - or 7.1% of global GDP - once the sum of undercharging for environmental costs and forgone tax revenues is taken into account.

  These subsidies make oil, gas, and coal artificially cheap, locking societies into carbon dependency.

- **Industrial Agriculture**: Subsidies promote monocultures, chemical fertilisers, and factory farming, undermining soil health and biodiversity.

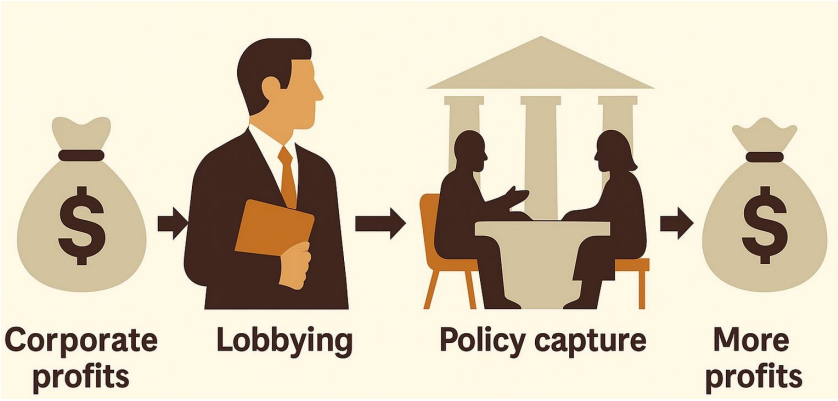
- **Mining**: Tax breaks and infrastructure support enable extraction, while cleanup costs are socialised.

These subsidies are not accidents. They reflect the structural role of governments in sustaining growth — even when it is destructive.



The Power of Lobbyists

In theory, governments regulate corporations. In reality, corporations often regulate governments. Lobbying, campaign financing, and revolving doors between public office and private sector ensure that policy serves commercial interests.



- **Case Example**: In the United States, fossil fuel companies are estimated to have spent over $124 million on lobbying in 2022 alone, shaping climate and energy policy (Earthday: The Gaslight Effect: Lobbying the the Fossil Fuel Industry, 2024).
- **Case Example**: The European Union's agriculture policy has been heavily influenced by agribusiness, maintaining subsidies for intensive farming despite environmental damage.

Lobbyists frame regulation as an attack on "freedom" or "efficiency," echoing arguments dating back to the 18th century. The spectre of socialism or state overreach is invoked to discredit any constraint on private power.

National vs. Transnational Power

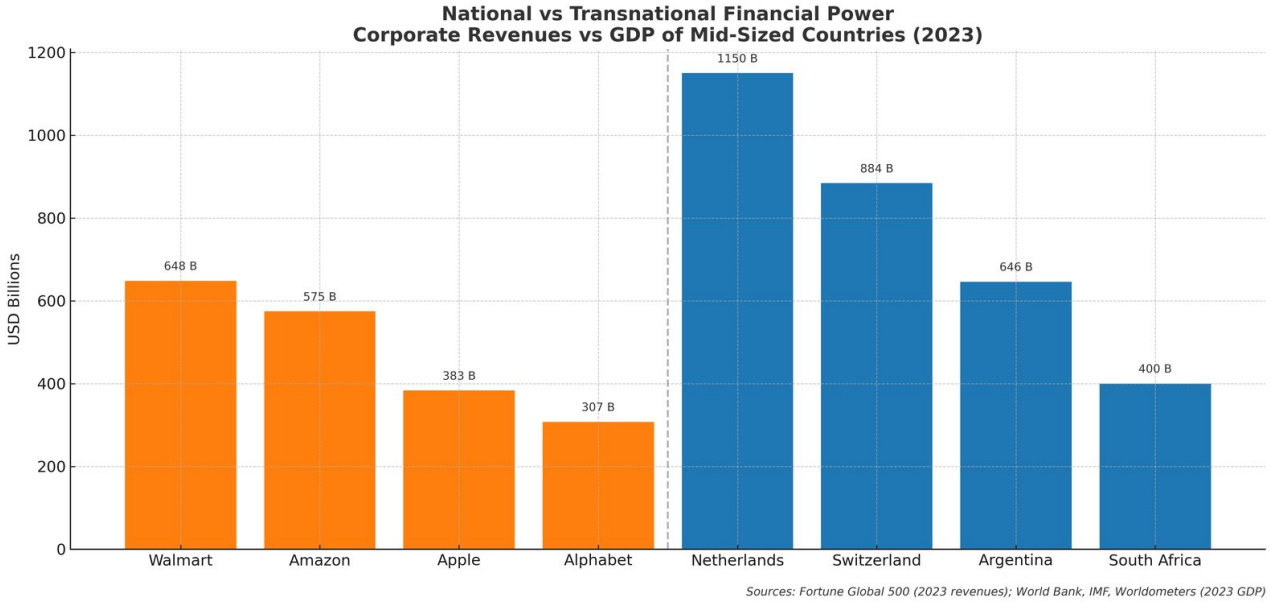
Another structural imbalance undermines governance: **scale**.

- Corporations are transnational; their supply chains, financing, and influence extend across borders.
- Governments are national; their jurisdiction ends at the border.

This mismatch leaves governments struggling to regulate globalised capital. In some cases, corporations have larger revenues than the GDPs of entire nations. For resource-rich but politically weak states, the result is exploitation, corruption, and resource plunder.

Case Example:

In many African and South American nations, extractive industries operate with state support, but profits flow abroad while environmental and social costs remain local.



Governments as Business Partners

Governments also depend on private enterprise for:

- **Tax revenues** — tied to corporate profits and consumption.
- **Innovation** — outsourcing economic imagination to business leaders.
- **Jobs** — positioning corporations as providers of livelihoods.

As a result, governments often adopt a business mindset themselves: efficiency, competitiveness, and "shareholder value" (in this case, GDP growth). Public policy becomes a tool to stimulate markets rather than protect citizens.

This alignment transforms governments from stewards of the commons into partners in extraction. States begin to behave like shareholders in the growth machine.

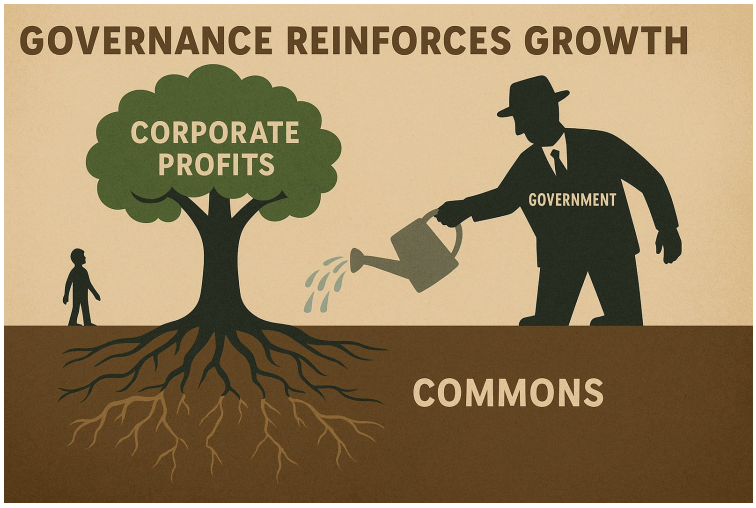
Case Example: Climate Negotiations

At international climate summits, governments present themselves as negotiators for humanity. Yet fossil fuel lobbyists are often more numerous than the delegations of vulnerable nations. National interests are defined in terms of competitiveness, not collective survival.

The failure to meet past pledges — from the Kyoto Protocol to Paris — reflects not only diplomatic weakness but structural capture: governments won't commit to degrowth of industries on which their fiscal systems depend.

Key Insight: Governance Reinforces Growth

Governments, far from restraining destructive systems, frequently act as their enablers. The pursuit of GDP, the subsidies to extractive industries, the capture by lobbyists, and the mismatch between national sovereignty and transnational corporations all point to the same conclusion: governance has become part of the growth engine.



"The money tree is largely in private hands. Governments have become gardeners, tending it on behalf of corporations rather than citizens."

The Four Drivers Together: The Treadmill to Oblivion

With this fourth driver, the cycle closes. These four drivers do not operate in isolation. They interlock into a self-reinforcing cycle:

- Debt-based money compels expansion.
- Industrial logics enable expansion.
- Engineered consumption absorbs expansion.
- Governance legitimises and sustains expansion.

Each driver amplifies the others. Together, they form a treadmill — a machine that cannot stop without collapse. Humanity is carried forward at ever-accelerating speed, even as the ground beneath us begins to give way.

This is why crises persist despite decades of warnings. Climate change, biodiversity loss, inequality, pollution — they are not aberrations of the system. They are products of its design.

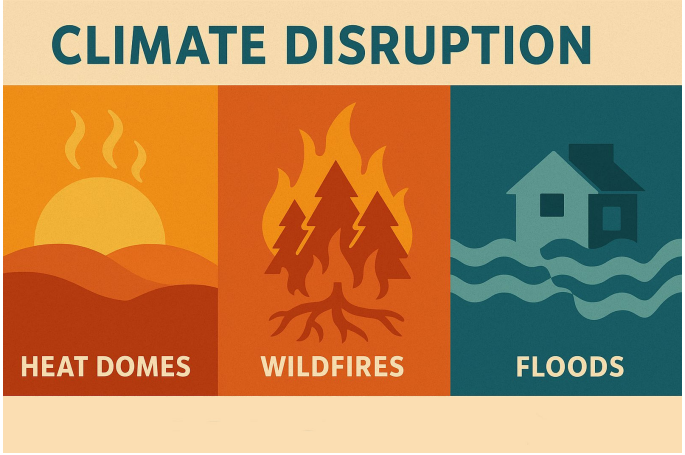
Part II: The Effects

The consequences of overshoot unfold across multiple dimensions: ecological, social, economic, psychological. They reinforce each other in spirals of instability.

Climate Disruption

The most visible effect of overshoot is climate change. Industrial energy use, particularly fossil fuels, has released billions of tonnes of greenhouse gases. The result: rising global temperatures, more frequent extremes, melting ice caps, and shifting weather patterns.

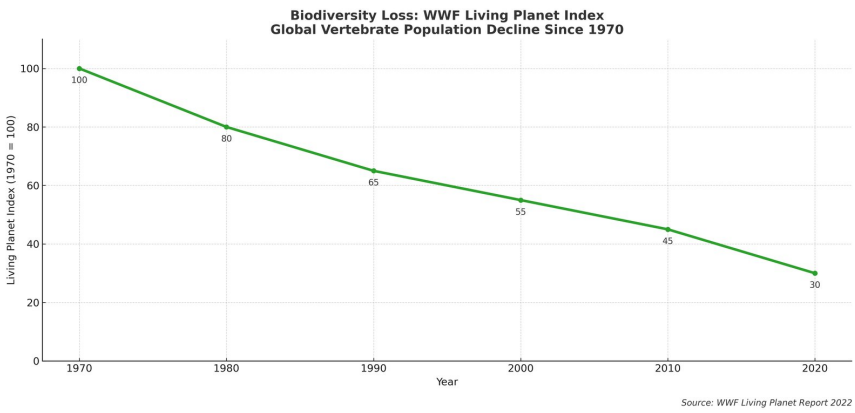
Case Example: In 2023, global average temperatures surpassed 1.5°C above pre-industrial levels for several months — breaching the threshold long warned as dangerous.



Biodiversity Loss

Industrial agriculture, deforestation, pollution, and climate disruption drive the sixth mass extinction. Species are disappearing at 100–1,000 times the natural background rate. Staggeringly, we have lost over 70% of the global vertebrate population in the last 50 years.

This is not only a tragedy of beauty lost. Biodiversity is Earth's operating system: it underpins food, water, air, disease regulation, and resilience. Its collapse threatens the very basis of civilisation.



Toxic Pollution

Synthetic substances accumulate across the planet.

- Plastics choke oceans and enter food chains.
- Industrial chemicals contaminate soil and water.
- Air pollution from fossil fuels causes millions of premature deaths annually.

We are literally ingesting the byproducts of industrial society. Microplastics have been found in human placentas; toxic chemicals circulate in our bloodstreams. The boundary between environment and body has dissolved.

Inequality and Concentration of Power

Overshoot is not evenly distributed. Wealth and power concentrate in the hands of a few, while billions struggle to survive.

- The richest 1% own more wealth than the bottom half of humanity.
- Large corporations wield more influence than many states.
- Resource plunder enriches elites while local communities bear the costs.

Inequality is not an accident; it is baked into the system. Those with capital access cheap credit, extract value, and accumulate assets. Those without fall deeper into debt and precarity.

"We are making the whole world into a business — and most of us are not shareholders."

Social Fragmentation and Ill Health

The effects are not only material. They penetrate the social and psychological fabric of life.

- Rising loneliness and alienation, even in hyperconnected societies.
- Epidemics of anxiety and depression, partly fuelled by consumerist culture and digital manipulation.
- Decline in physical health from processed foods, pollution, and sedentary lifestyles.
- Fragmentation of communities as local economies collapse under global competition.

Wars and Resource Conflicts

As resources grow scarce and competition intensifies, conflicts multiply. Wars in the Middle East, Africa, and elsewhere are often entwined with struggles over oil, water, and arable land. Climate change acts as a threat multiplier, destabilising fragile states and driving migration.

Breakdown of Cooperation

The scale of global challenges requires international collaboration. Yet the very system that generates crises also undermines cooperation. Rising nationalism, zero-sum competition, and corporate lobbying weaken the capacity of states to act collectively.

Climate negotiations stall. Biodiversity pledges go unmet. The treadmill continues.

Spiralling Debt

Debt has become a defining feature of modern life.

- **Households** borrow for education, housing, and even daily consumption.
- **Corporations** borrow to expand, merge, and speculate.
- **Governments** borrow to maintain services, subsidise industries, and bail out crises.

Debt is borrowing from the future to pay for the present. It assumes that tomorrow will always be bigger than today. But as planetary boundaries close in, this assumption becomes untenable.

The Madness of Overshoot

There is a deep irony in this trajectory. We are biological beings, utterly dependent on the biosphere — yet we are systematically destroying it. We replace living systems with artificial substitutes that cannot regenerate, cannot endure, and cannot sustain us in the long run.

- Forests become paper and furniture.
- Animals become protein units.

- Rivers become industrial drains.
- Communities become labour pools.

We are converting the living into the dead, the renewable into the exhaustible. It is, in essence, a form of madness: power without principles, ingenuity without conscience.

The Pyramid Scheme of Growth

The whole system resembles a pyramid scheme. Debt fuels production; production demands consumption; consumption requires more debt. Growth must accelerate to keep the pyramid from collapsing. But unlike financial scams, this one is planetary: its collateral is Earth itself.

"We are borrowing from the future to pay for the present. But the future is fast becoming depleted."

Summary of Effects

The systemic drivers of overshoot create cascading crises:

- **Ecological**: climate change, biodiversity loss, pollution.
- **Economic**: spiralling debt, inequality, fragility.
- **Social**: fragmentation, conflict, ill health.
- **Psychological**: alienation, dissatisfaction, disconnection from nature.

These effects reinforce each other, creating instability that feels increasingly uncontrollable. The system has become gigantic, self-propelling, and beyond the reach of individual agency.

Part III: The Belief Systems

The Stories We Tell Ourselves

The four systemic drivers — debt-based money, industrial logics, engineered consumption, and governance for growth — do not operate in a vacuum. They are upheld by a powerful superstructure of **beliefs, myths, and cultural assumptions**.

These stories make the system seem natural, inevitable, even desirable. They legitimise destruction by framing it as progress, competition as virtue, inequality as fair, and nature as inert and unsentient.

To dismantle overshoot, we must first expose the myths that sustain it.

Myth 1: Humans Are Separate from Nature

One of the most enduring assumptions of modernity is that humans stand apart from, and above, the rest of creation.

- Nature is cast as a resource, a warehouse of "raw materials."
- Animals are reduced to machines - *automata* - incapable of sentience and feeling — an idea popularised by René Descartes in the 17th century.
- Ecosystems are seen as obstacles to development rather than life-support systems.

This myth licenses exploitation. If nature is separate from us, then what we do to it does not affect us.

"We are nature. When we poison rivers and cut forests, we wound not only the greater whole but ourselves too. But the myth of separation blinds us."

Myth 2:When We Act in Our Self-Interest the Common Good Is Served

This is the great myth underlying capitalism. First enunciated by the father of economics, Adam Smith, the premise is that when we act in our self-interest - by individually seeking to profit from making goods and services - the common good is served even though we may not have intended it. Smith called this the "invisible hand" which benefits the common good. Smith defined the common good in purely material terms - that it is increased if more goods and services are created.

Over time, this foundational idea that pursuing self-interest is in the common good hardened into dogma: that each individual should be free to pursue their own interests and that unregulated markets inevitably lead to optimal outcomes.

In the 20th century, economists like Milton Friedman elevated this belief into near-religious doctrine. Regulation was cast as inefficiency; government intervention as tyranny. The market became the ultimate regulator.

But the invisible hand is blind to ecology. Markets measure exchange value, not intrinsic value. A forest cut for timber has more "value" in markets than a forest left standing to store carbon, house biodiversity, and filter and provide clean water.

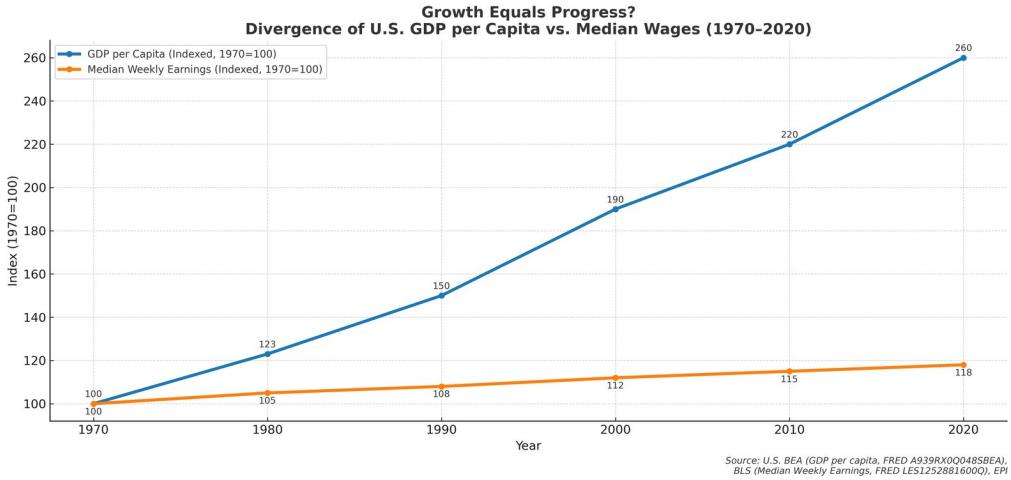
Myth 3: Growth Equals Progress

GDP growth has become the unquestioned measure of success. To politicians and citizens alike, more growth means more prosperity.

But growth is not the same as well-being. GDP rises with wars, oil spills, and factory farming. It does not count care work, clean air, or cultural vitality.

The belief that growth solves poverty is equally misleading. Rising GDP often coincides with rising inequality. Wealth accumulates at the top while billions remain excluded.

Case Example: In the United States, GDP has nearly tripled since the 1970s. Yet median wages have stagnated, and inequality has surged. Growth has enriched the few, not uplifted the many.



Myth 4: Wealth Is Possession

Wealth is equated with ownership of material goods and financial assets. Success is measured by accumulation.

But this view ignores other forms of wealth: ecological abundance, social bonds, cultural heritage, and time. True wealth lies in the health of relationships — with each other, with communities, and with the Earth.

The fixation on possession fosters enclosure of the commons. Land, water, and even genetic material are privatised and sold. Ownership confers rights without responsibilities, severing the link between stewardship and access.

Myth 5: Freedom Is Consumer Choice

Modern societies have redefined freedom as the ability to choose among goods and services. The more options on the shelf, the freer we are told we are.

But freedom of consumption is not true freedom. It is dependence on a system that shapes desires, limits imagination, and degrades the commons. It is a hollow freedom, confined to the marketplace.

"We mistake the freedom to buy and consume for the freedom to live."

Myth 6: Competition Is Better Than Cooperation

Capitalism enshrines competition as the driver of innovation and efficiency. Cooperation is dismissed as naive.

Yet in nature, cooperation is as important as competition. Ecosystems thrive through symbiosis: fungi exchange nutrients with trees, bees pollinate flowers, wolves regulate deer populations. Human societies, too, have always relied on collaboration.

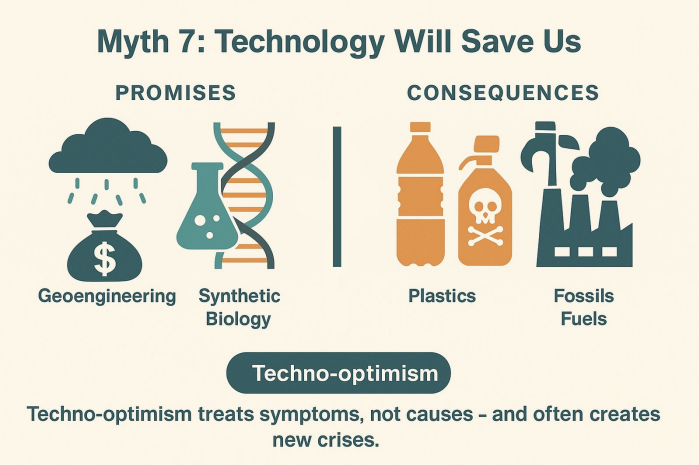
Excessive competition leads to a race to the bottom: cutting wages, exploiting labour, reducing quality, and externalising costs. True resilience comes from cooperation.

Myth 7: Technology Will Save Us

Another myth is that every problem created by technology can be solved by more technology.

- Climate change? Geoengineering will fix it.
- Biodiversity loss? Synthetic biology will replace it.
- Soil depletion? Lab-grown food will solve hunger.

This techno-optimism ignores the structural drivers behind crises. It treats symptoms, not causes. Worse, it often creates new problems: plastics, pesticides, and fossil fuels were once hailed as miraculous technologies.



Myth 8: Inequality Is Natural and Deserved

We are told that inequality reflects merit: the wealthy are smarter, harder working, or more deserving. Everyone supposedly has equal opportunity.

In reality, inequality is institutionalised. Access to capital, education, and networks is inherited. Systems are designed to protect privilege.

The myth of deserved wealth legitimises vast disparities and shields elites from scrutiny.

Myth 9: Unlimited Expansion Is Possible

Perhaps the most dangerous myth of all: that expansion can continue indefinitely on a finite planet.

This belief has deep roots in colonialism. To justify conquest, colonisers portrayed the Earth as boundless, its riches inexhaustible. Nature's sacredness was stripped away; land became "resource."

Today, the same myth underlies growth economics, global trade, and corporate strategy. It is not just false; it is suicidal.

The Blindness of Modernity

Taken together, these myths create what might be called the **blindness of modernity**. We imagine ourselves as separate from nature, guided by markets, propelled by growth, freed by consumption, destined for limitless expansion.

This blindness is not accidental. It has been cultivated for centuries, embedded in education, culture, and governance. It sustains the four drivers by making them seem rational and inevitable.

"The system does not persist because it is natural or optimal. It persists because we believe in it."

Key Insight: Stories Shape Systems

The drivers are structural, but the beliefs that sustain them are cultural. If the stories change, the systems can change. If we reimagine wealth, freedom, progress, and human identity, we can unlock pathways beyond overshoot.

Part IV: Solutions and Pathways Forward

From Overshoot to Renewal

We have seen how four systemic drivers — debt-based money, industrial logics, engineered consumption, and governance for growth — propel humanity into overshoot. We have traced their effects in ecological destruction, social fragmentation, and economic instability. We have uncovered the myths that keep the machine running.

Now comes the most vital question: how do we change course?

It is tempting to reach for technical fixes — new technologies, efficiency gains, market tweaks. But these remain within the logic of the system. They address symptoms, not drivers. They soothe without curing.

What is needed is transformation at the level of **values, structures, and imagination**. The path forward requires a redefinition of wealth, power, money, and our relationship with the natural world.

Principle 1: Reframe Wealth

GDP is not well-being. Possession is not prosperity.

We need **Real Wealth Indicators** that measure what truly matters: ecological health, social cohesion, cultural vitality, and human flourishing.

- **Ecological Wealth**: biodiversity, clean water, fertile soil, stable climate.
- **Social Wealth**: equality, trust, cooperation, mental and physical health.
- **Cultural Wealth**: heritage, creativity, wisdom, beauty.
- **Time Wealth**: freedom from overwork, the ability to care, to wonder, to rest.

A society that destroys its ecosystems to increase GDP is not growing wealthier; it is liquidating its inheritance.

Principle 2: Reclaim the Commons

Land, water, air, forests, fisheries — these are not "resources" for private plunder. They are the **commons**, the shared inheritance of humanity and the community of life.

- Establish legal frameworks to declare land and sea areas as commons, protected for the common good.
- End privatisation of genetic material, seeds, and biodiversity.
- Create community trusts to steward resources with responsibility, not just rights.

Ownership must be redefined as stewardship. To own must be to care.

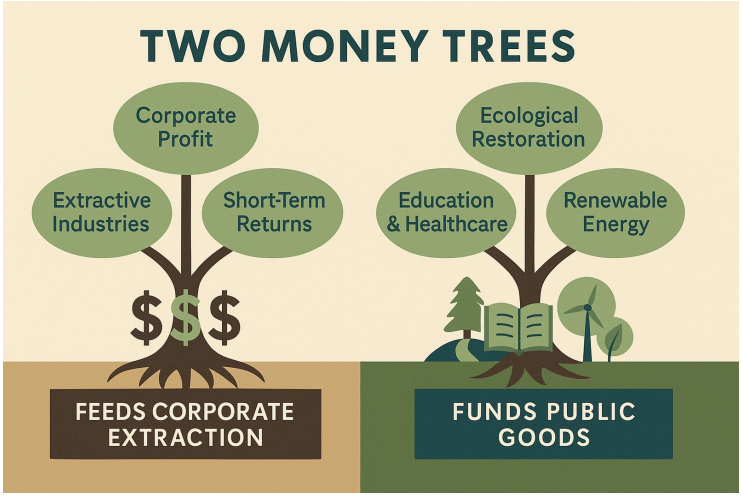
"The Earth was not created for some to own and others to rent. It was created for all to share."

Principle 3: Redesign Money

If money creation drives overshoot, then money creation must be reformed.

- **Public Money Creation**: Governments, through central banks, should be able to create money for the common good — to fund ecological restoration, education, healthcare, renewable energy.
- **Credit Guidance**: Direct private lending away from destructive sectors (fossil fuels, industrial agriculture) and toward regenerative ones.
- **Debt Relief**: Free households and nations from unpayable debts that enforce austerity and ecological exploitation.

Money must become a tool for life, not a machine for growth.



Principle 4: Restrain Power

Corporations and elites wield disproportionate influence. To create balance, their power must be checked.

- Enforce corporate responsibility for ecological and social harm.
- Tax wealth and profits fairly to support the common good.
- Limit corporate lobbying and the capture of policy.
- Break monopolies and support decentralised, community-led enterprises.

No entity should be allowed to profit by destroying the foundations of life.

Principle 5: Re-root in Nature

We are not apart from nature. We are expressions of it. Healing requires re-rooting human identity within the living systems that sustain us.

- Education systems must teach ecology not as a subject but as the basis of life.
- Urban planning must integrate green spaces, biodiversity, and water cycles.
- Health systems must recognise the link between human well-being and natural environments.

Case Example: Doctors in Canada now prescribe “time in nature” as a health intervention, recognising its role in reducing stress, improving mental health, and strengthening immunity.

Principle 6: Recover Values

The deepest change must be cultural. We must move from values of domination, extraction, and competition to values of care, reciprocity, and humility.

- **Stewardship**: The principle of doing no harm, of passing the world on intact.
- **Reciprocity**: Giving without always expecting return, as in familial bonds and ecosystems.
- **Wonder**: Restoring awe and reverence for the mystery of life.
- **Sufficiency**: Finding joy in what we have rather than endless accumulation.

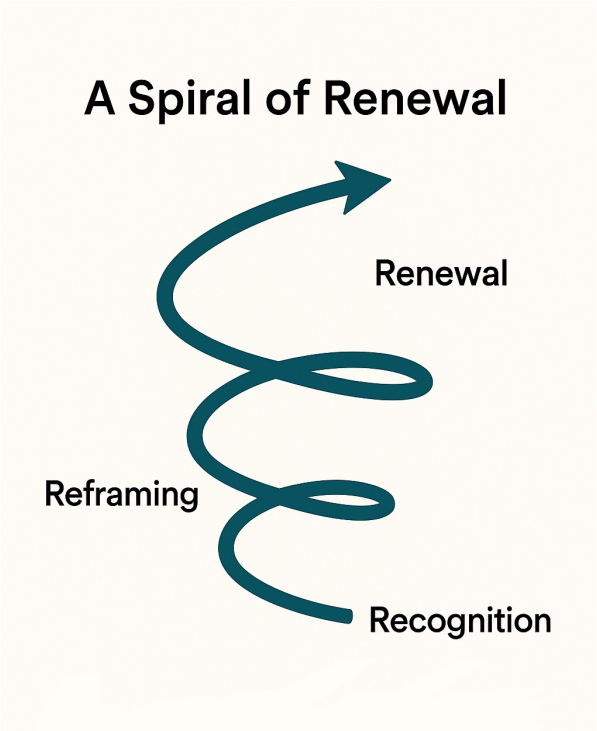
These values are not utopian. They are as old as humanity itself, found in indigenous traditions, religious teachings, and communal practices. They are simply buried beneath the machinery of modernity.

"We need so little if our minds are quiet."

A Spiral of Renewal

The pathway beyond overshoot is not linear but **spiral**: recognition, reframing, renewal.

- **Recognition**: Seeing the structural drivers clearly.
- **Reframing**: Redefining wealth, freedom, progress, and human purpose.
- **Renewal**: Building systems that align with ecological and social well-being.



Closing Vision: Ingenuity with Conscience

The same ingenuity that built the industrial world can help rebuild it — but only if guided by conscience. Power without principles is destruction; power guided by values can be regeneration.

We must remember:

- We created these systems.
- They persist because we sustain them.
- They can be changed because they are human-made.

"Our task is not to abandon ingenuity, but to marry it with humility. To use power with conscience. To serve life, not profit."

This is not just survival strategy. It is a vision of a different civilisation: one rooted in balance, justice, and reverence for the living Earth.

~~~~~~
~~~~~~