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From Save the Mountain to Saving the World
By Shel Horowitz

John Gardner, founder of Common Cause, referred to modern issues as "A series of great opportunities designed as insoluble problems."[i]

Like Gardner, I refuse to give up hope!

Ordinary people in my short lifetime have made sweeping changes even when facing "insoluble problems." Consider the nonviolent people's movements that overturned apartheid and segregation in South Africa and the American South…threw out Communist dictatorships in Eastern Europe…and brought enormous public awareness to numerous planetary challenges—and potential remedies.

Let me share the story of one citizen movement that achieved the "impossible"—and probe how lessons from that victory could solve other pressing global problems—like hunger and poverty, war, and catastrophic climate change.

Save the Mountain

In 1998, I moved to a bucolic antique farmhouse in rural Hadley, Massachusetts, near Skinner State Park—home to 960-foot Mount Holyoke. 15 months later, a front-page story in the local newspaper announced a developer's plan to build 40 McMansions, abutting the state park. Running from the scenic two-lane road at the bottom all the way to the ridgeline, his houses would destroy the view from the top of Mount Holyoke, and desecrate the number one visual icon of Massachusetts' three Connecticut River counties.

In the article, several local conservationists expressed variations on "Oh, this is terrible, but there's nothing we can do." So many people who should have known better had already given up hope. When I read their fatalistic comments, I got inspired to prove them wrong.

My wife, Dina Friedman, and I began organizing Save the Mountain (STM). I did massive outreach, while Dina planned the first meeting in a way that would lead participants to action.

With our years of environmental and social change organizing experience, we'd predicted the first meeting would draw maybe 20 people, and that perhaps five would become the core group. We felt that even such small numbers could create enough

friction and delay that after about five years, the builder would decide the hassle wasn't worth the effort.

So we were pleasantly astounded when more than 70 people jammed themselves into our dining room that night, and another 30 or so called to say they were interested but couldn't attend. We had to stack our two kitchen tables and clear off every flat surface in order to squeeze them all in.

Even more remarkable was the level of commitment. From that very first meeting, we organized several working committees (some that Dina and I hadn't thought of). Roughly 35 people got seriously active: over the next 13 months, they researched technical issues like endangered species and storm water runoff…hired and coordinated lawyers…lobbied elected and appointed government officials at the town, state, and even federal levels…staffed tables at farmers markets and festivals…knocked on doors…prepared fliers, web pages, press releases, and other outreach materials…and raised the money and visibility to build an effective organization.

These were not just activists. Our movement included farmers, academics, small business owners, scientists, politicians, park rangers, retirees, and even school children. One child organized her entire sixth grade class to write letters to the editor opposing the project, several of which were published. A first-grader got local merchants to donate prizes for a children's fundraising raffle. And our volunteer web designer was a local teenager.

In addition to the three dozen who served on committees, thousands of people at least signed a petition, put up a lawn sign, or slapped a bumper sticker on their vehicle.

We routinely brought out crowds of up to 450 at public hearings (in a town of about 5000), and submitted more than 1200 petitions. We had lawn signs all around the whole county. Our news coverage—more than 70 print articles, plus a few dozen TV and radio stories—extended all the way to Boston, about 100 miles away.

In short, we were able to convert outrage, shock, and despair area into a powerful—and highly visible—public force. Once, the developer and his wife encountered one of our outreach teams at a public event and the wife shouted, "You people are everywhere!" And it did seem that way.

At its core, this was a consensus movement—not in decision-making, but that there was widespread agreement that this project should not be built. Since we didn't have to persuade people about the merits of stopping the project; we focused on challenging the "expert" assumption that the development was unstoppable; we had to convince our valley that a committed group of people could halt construction.

Within two months of our founding, STM had shifted the discourse from "There's nothing we can do" to "Which strategies will be most effective?" Collectively, we used our powers of persuasion; together, we could change the project from inevitable to impossible.

At Town Meeting, several months into the campaign, we passed three different zoning bylaws to make it extremely difficult for a future developer to build on any of the mountains in town (for example, requiring a special permit for building lots above 350 feet in altitude). Meanwhile, intense negotiations were going on to thwart the immediate proposal. Just 13 months after the original article, our lawyers, in cooperation with the Massachusetts Department of Environmental Management, worked out a way for the

state to buy most of the parcel (with the help of a wealthy philanthropist who funded the purchase) and add it to the adjacent state park.

We allowed two houses at the bottom, which were appropriate to the scale of the neighborhood and did not threaten the landscape. The rest was permanently preserved, four years ahead of our original five-year estimate.

Mindset: STM's Victory and the Key to Global Solutions

Perhaps the biggest victory was not about the mountain at all. It was the new mindset that people in town didn't have to sit passively by while their world was destroyed—we could get together and chart a better course. STM's victory became possible when the town and region threw away assumptions and changed their mindsets. Similarly, we can change our collective mindsets about our ability to make a difference on catastrophic climate change, wars and violence, malnourishment and poverty, extremist movements and repressive dictatorships, and other global issues.

In his 2008 book, *Hot, Flat and Crowded*, Thomas L. Friedman calls for an "ethic of conservation." That's one step, but we need something more: just as STM needed a possibility mindset, so we need a conservation mindset. When people, and nations, vie to control scarce resources, squeezing those resources exponentially farther enables social change. Always, we should ask, "how can we achieve this goal with fewer resources?" Sometimes, this will mean a sweeping change—sometimes, a small, incremental improvement.

The first piece of good news is that many of these problems are really extensions of a single problem: un-smart resource use. So when we get smarter about resources, we fix multiple problems all at once.

Second, we've already developed many solutions. As we squeeze more value from every input, rein in pollution and environmental destruction, and fix distribution inequalities, many of these sub-problems dry up and blow away. The science and engineering to address these issues already exists—but disempowered mindsets create political failure where we should see success.

Solving seemingly intractable problems requires considerable mind-shifting throughout society. Just as a farmer doesn't just scatter seeds on an open field without plowing first, we can "prepare the ground" by following a few key principles:

- Throw away our assumptions
- Work backward from the goal
- Count ALL the costs
- Focus on achieving abundance, instead of managing scarcity
- Eliminate the friction points
- Design for multiple uses
- Use nature as a model/close the loops

Let's briefly look at each of those principles, and how we can harness them to help solve so many of these major crises—and then, what part each of us can play in the transformation.

Throw Away Our Assumptions

We progress when we think not only outside the box, but beyond existing conventions entirely. Look at some examples throughout history.

Assumption, 14th century: the world is flat, and you can sail off the edge if you're not careful. Reality: the world is spherical, and often the shortest routes go over the poles.

Assumption, 17th century: humans can travel no faster than the fastest horse. Reality: humans aboard the International Space Station have traveled at 17,247 miles per hour; future technologies, imagined by novelists, might take us orders of magnitude faster.

Assumption, 19th century: Owners have the right to extract the world's resources, and to despoil the land and water with waste; the planet is abundant and resilient. Reality: the land, water, and sky's capacity for abuse is finite; human-caused carbon pollution beginning about 200 years ago has pushed us to the brink of catastrophic climate change—and companies that polluted decades ago now face expensive lawsuits and large fines.

Assumption, 20th century: "citizens" can be transformed into "consumers." Isolated from nature, sealed off from germs, seldom interacting with neighbors, we can find happiness through buying lot of stuff. Reality: We need community, and we need nature. TV culture constructed walls between us, but as we build new structures like CSA farms, interest-based or regional salons—and empowering advocacy efforts like STM—we break down those walls and energize a community.

Work Backward from the Goal

How do you get to any destination? Work backward from the goal—then figure out how to get there.

Thomas Edison envisioned an always-available light source not needing fire; it took 10,000 attempts to work backward from that goal and invent electric light.

Steve Jobs didn't set out to incrementally improve portable music players or call-and–that's-all mobile phones. He first told his engineers to put a thousand songs into a finger-sized device…then, a versatile and Internet-capable combined PDA (Personal Digital Assistant) and phone…and later, a robust and portable device that could do almost anything that a phone, camera, music and video player, PDA, or a traditional computer could do. Working backward from these goals, Apple created the iPod, the iPhone, and the iPad—and *then*, once these new niches (and wildly successful markets) were established, incrementally improved them.

So, if the goal is world peace, we envision a peaceful world…brainstorm paths to get there…and develop the most promising alternatives. Instead of armies and weapons, we could train citizens in deep democracy (like STM) and nonviolent conflict resolution. Or we totally rethink resource use, so wars aren't started over who happens to control reserves, and no class of have-nots is so embittered that it embraces guerrilla warfare, terrorism, and destabilization.

Rather than grafting environmental safeguards onto highly polluting manufacturing processes, let's backward-engineer clean technologies from the goal of creating clean industry—as bioengineer John Todd did. He was asked, "With safe drinking water such a valuable commodity for less developed countries, do you see ecological technologies as having the potential to deal with viral diseases and vectors so that natural water systems can be purified for community consumption?" And he answered, "Amory Lovins brought me into a project that is studying the feasibility of making refugee camps sustainable. There are millions of people around the world who are homeless, and one of our responses to their plight was the idea of the transparent tube—a pipeline, only it's clear; you can extrude clear pipeline material that goes for miles. You seed the inside with all different kinds of aquatic life, which can't come in contact with the atmosphere. During the day the sun shines on it, and gases are formed inside so that the tube swells up like a balloon; then at night the darkness of the CO2 world is dominant, and the oxygen begins to disappear, with day-night pulsings as a result. The water flowing through is filled with various kinds of viruses and pathogens, which are subjected to great ecological diversity in the pipeline and great oscillation in the environment. We believe in theory that it is possible to eliminate most diseases in water effectively, ecologically, and cheaply…That's one of the ideas we're looking at for treating human pathogens."[ii]

Instead of bemoaning food shortages, work backward from a goal that every person around the world has enough to eat, sustainably—to shift our crop mix, growing methods, food distribution and purchasing systems, and more.

In policy, let's replace regulations, subsidies, and tax systems that encourage mindless consumption (such as oil depletion allowances, nuclear insurance subsidies, and capital-investment-based utility rates) with pro-conservation measures (like basing utility rates on energy savings). For health, let's create policy incentives to keep people healthy through education and preventive care.

Count ALL the Costs

We must stop externalizing costs onto other people or future generations. Energy companies are among the worst culprits here.

Most of our energy comes from finite, polluting resources: oil, coal, natural gas, and uranium.

For coal and natural gas, first-level costs have actually dropped. Superficially, it looks cheaper to access coal reserves via mountaintop removal and to blast gas out of rocks through hydraulic fracturing ("fracking"). But these destructive technologies are *only* cheaper as long as nobody counts the severe environmental, public health, agriculture, and even tourism impacts.

These technologies are even more devastating to the environment than strip mines of decades past. But energy companies don't pay for most of this destruction. They've externalized these costs, usually to taxpayers and neighbors.

Fracking creates enormous cost in water quality degradation. Fresh, clean sources of water are rendered undrinkable—with negative health, agriculture, and economic consequences. Future generations may forgive us for squandering fossil fuels—but NOT for poisoning and wasting the water.

With oil, the easy reserves have largely been tapped, so we start extracting in ever-more-costly and environmentally harmful ways—even tar-sands oil extraction, with potentially catastrophic consequences including sharp spikes in climate-heating greenhouse gases, pollution, and prices.

Externalizing true costs of nuclear power created an entire industry on a house of cards. Nuclear apologists ignore routine radiation, thermal pollution—and the thorny problem of fail-proof waste storage for 250,000 years: protecting nuclear waste dumps against leakage, terrorist attacks, accidents, etc., even while language and technology evolve beyond recognition.

And if there's another serious accident? Globally, insurance laws shift the consequences to us. Example: The US's Price-Anderson Act limits nuclear accident liability to a tiny fraction of actual damage estimates, subsidizes the insurance premiums, and pushes the true cost of both insurance premiums and damage claims onto the taxpayers.[iii] Nuclear apologists insist that catastrophe is unlikely; yet we've come to the brink at Three Mile Island, Fukushima, and at least 30 other accidents.[iv] Chernobyl left large swaths of the Ukraine uninhabitable decades later.

Why do we let resource extraction companies shift the real costs to us?

This mindset is a problem in other arenas, too. For example, against all logic, in March, 2013, the United States government enacted the so-called "Monsanto Protection Act," which exempted genetically modified foods from much government oversight, even if they're found to be dangerous.[v]

Rational, earth-centered, solution-oriented economics would factor in all costs and challenges. The Precautionary Principle[vi] tells us to set the brakes if something could cause significant harm. We don't know yet if GMOs are safe. We do know that many pesticides and herbicides are carcinogenic, and that much genetic engineering is designed to increase plants' ability to tolerate these toxic chemicals. So how could we adopt a law that removes all responsibility for unleashing unproven GMOs and vastly increasing the amount of carcinogens in the environment?

Europe, Australia, and Japan, and even some cities (including San Francisco) have begun to embrace the Precautionary Principle.[vii] And companies that had polluted with seeming impunity are beginning to face expensive remediation. Examples: the $19 billion judgment in Ecuador against oil giant Chevron for environmental and human rights abuses in that country,[viii] and the tobacco industry settlement of $246 billion.[ix] How much would these companies have saved if they'd followed the Precautionary Principle to begin with?

Focus on Achieving Abundance, Instead of Managing Scarcity

As the world becomes more crowded and adopts high-consumption lifestyles, finite resources get depleted, and costs spiral upward. But that's managing scarcity—a no-win approach. What if, instead, we managed for sustainability—even abundance?

Why power those industries and lifestyles with scarce fossil and nuclear resources? Instead, design for energy abundance through clean, safe, renewable energy sources.

And we have those sources. The sun alone contributes more energy every hour than humans planet-wide use each year.[x] Add wind, hydro (especially small-scale, no-dam, systems), tidal, magnetic, geothermal, and other clean, renewable energy sources—plus

massive energy savings from conservation—to create an abundance economy. Tthe Empire State Building, constructed when oil seemed infinite, slashed its annual energy bill by $4.4 million; its $13 million retrofit pays for itself every three years.[xi]

This principle extends well beyond the energy sector. We can have abundance in food, transportation, healthcare, information technology…

Eliminate the Friction Points

Friction is resistance that gets in the way and slows a process down. Whether physical or metaphorical, it takes lots of energy to overcome. When we eliminate friction, we need far fewer resources to move forward.

And while we've made many strides in reducing friction—that's what the whole science of aerodynamics is about—we can do far, far more if we embrace a low-friction mindset. For example:

1. As far back as 1997, flooring manufacturer Interface slashed an astounding 86 percent of the energy from one carpet making process, just by substituting well-insulated, short, wide, mostly straight pipes for conventional long, thin, bendy, poorly-insulated pipes. This single friction reduction allowed much smaller, variable-speed, fuel-sipping pumps—and eliminated several energy-wasting valves.[xii]

2. Transmission/distribution losses waste 7% of electric power.[xiii] Producing power where it's used (e.g., rooftop solar, on-site hydro) recaptures that 7%.

3. In agriculture, permaculture, organic, no-till, pollinator habitat integration, companion planting, and biodynamic farming reduce friction by reducing external inputs (pesticides, farm equipment), and by building up the soil and protecting it from erosion.

4. In education, collaborative peer learning groups, teaching to different learning and personality styles, and valuing different types of intelligence reduce the friction of one teacher attempting a single approach to a widely divergent group of students.

5. In urban planning, well-designed separate-right-of-way mass transit reduces friction with convenient, fast, affordable eco-friendly alternatives to private vehicles (like the amazing bus system of Curitiba, Brazil).[xiv] Fewer cars—especially one-occupant cars—reduce congestion, travel times, parking competition, and greenhouse gasses—multiple benefits. And as people experience clean air, unclogged streets, and rapid travel, more make the switch, expanding the positive impact.

6. Even reducing metaphorical friction offers benefits. Stephen M.R. Covey, in *The Speed of Trus*t, argues that character and competence reduce friction from bureaucracy and regulation.

Design for Multiple Uses

In Amory Lovins' super-efficient Colorado home, a single arch performs 12 functions involving architectural integrity, lighting, and temperature control, saving cost and

space.[xv] Built all the way back in 1983, Lovins' near-net-zero-energy home in the snowbelt near Aspen doesn't need a furnace or air conditioner, and Lovins grows bananas in his sunroom.

A single networked multifunction printer can replace several printers, copiers, and fax machines.

As we saw earlier, a smartphone can eliminate separate phone, video and still camera, GPS, audio recorder, and more, while adding web browsing, email, and even credit card processing.

Say you're a rice farmer in Pakistan. Before, you laboriously hauled your crop to town to accept the sole buyer's take-it-or-leave-it price. Now, you use that smartphone to check rice prices in Karachi. You negotiate a better price locally, because you know weather conditions and crop yields, compare notes with other farmers, and know what your rice is worth. Maybe you even find better prices with an organic, fair-trade commodities broker. You, your family, and, eventually, your whole community lift your standard of living, through a gizmo in your pocket.[xvi]

A green roof can serve multiple functions such as climate mitigation; food; bee/butterfly habitat; water recapture; insulation; replacement of nonbiodegradable materials; financing advantages; energy savings… Solar provides zero-fossil-fuel, low-maintenance, clean renewable energy.

Combine these two technologies for even more benefit: solar actually works about 15% better on a green roof![xvii] Wow!

Use Nature As A Model/Close The Loops

Nature doesn't waste. Trees and animal carcasses decompose into soil. Spring floods replenish the earth. Wind moves pollen across distances. Every species is born, lives, reproduces, and dies—and becomes something other organisms use. Every creature has a habitat. All materials are recycled. Consider compost: bacteria digest used-up plant matter, and cycle it back into food for plants. Yes, there are blips. Yes, some cycles are hard to see because they may extend tens of thousands of years or through dozens of interrelated systems—but overall, the system achieves stasis. It's self-perpetuating—sustainable.

We, too, must stop generating waste. Animals convert oxygen to carbon dioxide; plants convert it back to oxygen; neither could exist without the other's "waste." A zero-waste world requires every output to become an input. As humans, we can mimic nature's complex interrelated systems.

The new science of biomicry models solutions from nature,[xviii] and enables enormous cross-industry innovation.[xix]

At the Intervale in Vermont, spent brewery grain grows mushrooms…mushroom leavings feed fish…fish waste fertilizes organic greens…which could nourish the beer grains. The system has operated for 25 years and even extracts, harvests, and resells heavy metals that would otherwise pollute.[xx]

John Todd's Ocean Arks International develops similar interrelated systems to clean up polluted water, using a dozen or more "restorer" systems.[xxi]

Nature is holistic. Have you heard of the "butterfly effect?" A single butterfly flapping its wings can impact climate change a continent away.[xxii] The Intervale is also holistic. Its designers think in terms of ecosystems and bioregions.

If that kind of complex, layered ecosystem is too challenging to envision, remember that often, it only takes two processes working together to make a far greater difference than either alone. Here's a much simpler example: For decades, some power plants have been designed for "cogeneration": producing harnessable heat and electricity at the same time (and not allowing that heat to escape into the environment to add to global warming).

Holistic thinking gets really exciting when solving human problems. Just like the butterfly's wing—or founding a citizen movement in my dining room—little improvements can make enormous differences.

Think for a moment about the impact holistic thinking has already had on humans' relationship to our planet and its resources, starting at least as far back as Rachel Carson, Buckminster Fuller, and Helen and Scott Nearing, if not all the way back to 18th-century visionaries like Thomas Jefferson and Benjamin Franklin.

In these first decades of the 21st-century we must question one final assumption: problems such as environmental degradation, food shortages, and wars over resources are intractable: Reality? Just as STM achieved the "impossible," these issues, too, can become opportunities for greatness. As I've demonstrated above, we have the know-how and technology. Can we find the will?

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Note: All URLs verified March 22, 2014

[i] As cited in *Hot, Flat, and Crowded* by Thomas L. Friedman. New York: Farrar, Straus & Giroux, 2008, hardback edition, p. 170.

[ii] Twenty-First Annual E. F. Schumacher Lectures, October 2001, Amherst, Massachusetts, http://neweconomicsinstitute.org/publications/lectures/Todd/John/Ecological-Design

[iii] http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/funds-fs.html; <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0CFsQFjAE&url=http%3A%2F%2Fwww.citizen.org%2Fdocuments%2FPrice%2520Anderson%2520Factsheet.pdf&ei=QhBwUfPME7Hh4AOX8YGgBA&usg=AFQjCNFcWbW4YlPU7j8Tc_5mCL7u8fjNYA&sig2=1T-hgl2W6Mrs1JoGDQl0fg&bvm=bv.45368065,d.dmg>.

[iv] http://www.theguardian.com/news/datablog/2011/mar/14/nuclear-power-plant-accidents-list-rank, downloaded March 22, 2014

[v] http://www.ibtimes.com/monsanto-protection-act-5-terrifying-things-know-about-hr-933-provision-1156079

[vi] http://dictionary.reference.com/browse/precautionary+principle

[vii] http://en.wikipedia.org/wiki/Precautionary_principle#European_Commission

[viii] http://www.businessweek.com/articles/2012-10-09/chevron-fails-to-squelch-19-billion-ecuador-verdict

[ix] http://www.npr.org/series/97193028/the-tobacco-settlement-10-years-later

[x] http://en.wikipedia.org/wiki/Solar_energy, with numerous embedded reference citations. See also Technical Note 1.

[xi] http://blog.rmi.org/blog_empire_state_retrofit_surpasses_energy_savings_expectations

[xii] Kristine Chan-Lizardo, et al. "Big Pipes, Small Pumps: Interface, Inc. | Factor 10 Engineering Case Study," Snowmass, CO: Rocky Mountain Institute, February 2011, downloaded 3/4/13 at http://www.rmi.org/Knowledge-Center/Library/2011-04_BigPipesSmallPumps

[xiii] http://www.eia.gov/tools/faqs/faq.cfm?id=105&t=3

[xiv] http://www.urbanhabitat.org/node/344

[xv] Condensed from http://www.rmi.org/Knowledge-Center/Library/2010-15_LovinsGreenHomeCase, downloaded 3/4/13. See also Technical Note 2.

[xvi] Similar real-life examples are described in books like *The Fortune at the Bottom of the Pyramid* by C.K. Prahalad.

[xvii] http://www.triplepundit.com/2013/03/green-roofs-boost-photovoltaic-panels/

[xviii] http://biomimicryinstitute.org/about-us/what-is-biomimicry.html

[xix] See, for instance, the seven examples at http://www.mnn.com/earth-matters/wilderness-resources/photos/7-amazing-examples-of-biomimicry/related-photos

[xx] http://www.frugalmarketing.com/dtb/intervale.shtml

[xxi] Ibid.

[xxii] http://www.stsci.edu/~lbradley/seminar/butterfly.html

Technical Notes:

1. "The total solar energy absorbed by Earth's atmosphere, oceans and land masses is approximately 3,850,000 exajoules (EJ) per year.[7] In 2002, this was more energy in one hour than the world used in one year.[12][13] Photosynthesis captures approximately 3,000 EJ per year in biomass.[14] The technical potential available from biomass is from 100–300 EJ/year.[9] The amount of solar energy reaching the surface of the planet is so vast that in one year it is about twice as much as will ever be obtained from all of the Earth's non-renewable resources of coal, oil, natural gas, and mined uranium combined,[15]": Wikipedia, "Solar energy."

2. Full list: "The arch's dozen functions include controlling and storing heat; aesthetics and acoustics; diffusing light; holding up the roof beams and glazing; distributing various cantilevered loads; housing the cooling vents and atrium lights; and actively collecting solar heat. In addition, the arch forms a white "light scoop," bouncing daylight into the sides of the building and helping to make the whole structure up to 95% daylit."