

Letter from SI

Sustainability Institute • Spring 2008

"What we are rarely told is that solutions are as interconnected as problems. One good environmental action can send out waves of good effects as impressive as the chain of disasters that results from environmental evil."

-Donella Meadows, Problems are Interconnected -- and So Are Solutions (2/18/1988)

Notes from Place - Barn Chores and Climate Change



Raspberry munching on hay

Nora and I tromped down the hill together on a recent morning, kicking through a deep layer of new white snow on our way to chores in the barn, imagining spring not far away, but still bundled up in our winter layers and watching our step on icy paths.

We filled water buckets, cleaned out wheelbarrows-full of manure, refilled mangers with hay, and fed bottles of warm milk to the youngest calves. Outside the barn, the world was white and hushed, inside it was alive with the chatter of a seven year old, the munching of horses, the occasional bleat of a sheep.

We were cold by the time we came home to our cups of tea and hot chocolate but already, at the beginning of our day, we had done something together that was essential, at least to the ten or so animals we cared for, and we had done it well and carefully. We had chatted with our neighbor who was milking cows and noticed the feel of snow on our eyelashes. By eight in the morning this one child had done real work, tending, feeding and caring for the source of part of her own

sustenance.

I would do this with her anyway, whether I held a sense of responsibility to the future, or not. Whether I felt the need to find ways to live that contributed less to climate change, or not. But, knowing that local organic food uses less fossil energy than food produced conventionally and shipped long distances gives our winter chores another layer of meaning. For the morning's activities, my family gets not only fresh local milk to drink but, in some small way, an answer to "what should we do about climate change?"



view of the barn in late winter from Cobb Hill houses

In the world of policy makers and engineers that question is usually answered with ideas about technology and markets, both of which should, by all means, be applied to the challenges before us.

But I know, from my own experience, that the universe

of possibility for responding to climate change stretches far beyond cap-and-trade policy and carbon sequestration technology. Not always, but much of the time, this universe stretches in directions that are also beautiful, healthy, and full

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of meaning and and towards possibilities that could help build the kind of resilient communities that will have the best chances of riding smoothly through the instabilities of a changing climate.

For my family many of the possibilities seem to begin with taking care of some of our needs through our own work on our community's land. That's what makes sense to us here, in our rural river valley, and that's what we enjoy doing.

In other places, the activities that reduce greenhouse gas pollution, while improving community resiliency and producing fun and satisfaction may look

very different from the form they are taking here in Vermont for my family. Elsewhere they may look like a green jobs program or land conservation or community theater or a rebirth of local manufacturing. Come to think of it, I'd like to see all of those things in my community, too.

That's part of the beauty and excitement of this challenging time, isn't it? Creativity and ingenuity are being called forth in ways that are specific to each of us, whatever place we call home.

— Elizabeth Sawin

Pea Beans in Ethiopia — challenges of creating new business models for sustainable livelihoods

Ethiopia is a wonderfully unusual place in Africa. It has never been colonized, only occupied by the Italians during World War II for about 5 years. With 77 million people, it is one of the larger countries in Africa. While for much of its history Ethiopia has been fragmenting into small kingdoms frequently at war, long periods under emperors have given Ethiopia the rare concept of being a unified country. With only 16% of the population urban, Ethiopia is still one of the most rural countries in Africa.

As with many neighboring countries, rural poverty and chronic hunger are extensive in Ethiopia. Over 60 million people (more than 80% of the population) live below a poverty line of \$2 a day. Of those, 24 million live on less than half a dollar a day. Each year around 10 million people are at risk of starvation.

I had the opportunity recently to travel in Ethiopia with colleagues from partner organizations involved in a project within the Sustainable Food Lab called New Business Models for Sustainable Trading Relationships. Through the New Business Models project we are focusing on improving five food supply chains in

different parts of Africa. In Ethiopia, we are working to improve and expand trading opportunities for farmers growing white pea beans (navy beans) in areas that are vulnerable to chronic hunger.

Why pea beans?

White pea beans are grown in Ethiopia during two seasons - the short rainy season in the spring and the longer rainy season in the summer. It is not a locally consumed crop; 90% of the harvest is sold for export. Over 40 thousand farmers were engaged in this export crop during 2007 and participation is expanding rapidly due the recent increase in prices.

Ethiopia's climate, while very dry and vulnerable to extended droughts, is relatively good for pea beans. This and other pulse crops (beans, lentils, and peas) are considered "pro poor." They dry well, can be stored easily, and require less fertilizer than grains such as teff. These qualities make them attractive to farmers with poor access to reliable transportation and little cash for fertilizers.



A good market for the farmers

Prices Ethiopian farmers receive for white pea beans have been sharply increasing — more than 300% over the last 4 years. Before 2005, prices were at or below the cost of production. Currently, farmers expect prices to continue rising and, as a result, are rapidly expanding production areas. .

Land in Ethiopia is not privately owned, individuals have “use rights” to land as long as they live there. Farmers in Ethiopia typically have use rights to about 2 hectares, with $\frac{1}{2}$ planted for food crops and $\frac{1}{2}$ for market crops. As

prices have increased, farmers have moved more of the market area to pea bean production.

Farmers sell their pea beans to traders and the ability to set prices (market power) is currently in the hands of the farmers. The profit margins for traders and distributors are staying constant, suggesting a rare situation where they don't have as much market power. New exporters, including farmer-owned cooperatives, are rapidly entering the market.

With pea bean prices high and rising, the current market is working well for farmers including those in some of the traditionally most food insecure areas.

Dilemmas of a boom market

With market power in their hands, farmers in Ethiopia are not engaging with the exporters in any long-term

contracts for white pea beans. Instead, many are banking on the prices increasing even more. Farmers see no reason for building long-term relationships with buyers while the market is booming. Some are even breaking contracts with exporters, in hopes of receiving the latest high price.

But markets tend to correct quickly when demand is short and prices are

high, and only slowly when prices are low and supply is too high. There is a real possibility that the white pea bean price will overshoot and collapse. A dramatic “market correction” could mean a rapid drop

in prices and incomes in these areas of high poverty and food insecurity. We talked with farmers who were doubling their planting area in beans for 2008, and because they are expecting prices to keep increasing they are holding all sales to the end of the harvest season in hopes of capturing the highest price. If the harvest overshoots the demand, or the local price shoots past the international market causing the exporters to leave, the farmers may find a very rapid drop in price at the end of the season. For many families, the cash from sales at harvest time is critical to their ability to get through the year.

When we see this boom-market, some of the questions my colleagues and I ask include:

- 1) What are the limits of price increases? How would farmers know if they were in danger of overshooting the market?
- 2) If there is danger of over



sorting white pea beans at the local cooperative

"I've been farming for 27 years and I'm still trying to forget the first 25"

- Ethiopian pea bean Farmer

The current variety of pea beans grown in Ethiopia has been in use for over 40 years, but yields are relatively low and variability quite high.

shooting the market, should (and can) we encourage the farmers to be in longer-term contracts?

- 3) With farmers who are so new to business planing, what does it take for them to think about a 5-year plan?... or to think about contracting as a form of risk management and market stability?

Potential ingredients of new business models

Our conversations with actors all along the supply chain — from farmers to exporters — revealed a number of places where market problems could potentially be addressed through better business models developed in partnership with all the businesses involved.

Seeds

The current variety of pea beans grown in Ethiopia has been in use for over 40 years, but yields are relatively low and variability quite high. Several exporters want to introduce new white pea bean varieties to increase both the average size and consistency of size of the beans. NGOs have been looking at introducing new varieties as a way to increase yields and so boost production.

When times are good, Ethiopian farmers traditionally keep a portion of the harvest as seed for the next season's planting. But when farmers need cash, they will sell the pea beans they have saved for seed. Then at the next planting season they will have to take seeds as a loan from traders. This is a problem for introducing new varieties because as soon as the farmer sells all the beans back to the trader, they are

mixed in with the existing varieties and the purity of the new strain is lost.

Catholic Relief Services, one of the partners in the New Business Models project, has been supporting farm groups to adopt a new pea bean variety and develop seed businesses. But growing white pea beans for seed is a different kind of business from growing for sale into the food supply chain. Farmers need to hold the seed after harvest and sell to other farmers at the next planting time. Without shifts in business understanding and a level of economic security, many farmers growing seed may fall back on selling the harvest as food when they need money rather than holding it and working the longer-term seed business.

Quality

New pea bean varieties that increase the quality of the crop can also pose challenges when selling into a system of small-scale traders. One new variety promoted for its increased size, higher yield, and drought resistance

has brought lower prices to farmers than the old variety. The difficulty lies in finding the right buyer in the very complex system of local traders. A trader who buys the new, larger-sized pea beans will

need to have access to (or create) a separate supply channel that pays a higher price. But traders have not been profiting from the rising prices of pea beans, so have little margin for creating new systems. So, the new variety simply gets mixed with the rest of the pea bean harvest.

The current system - where individual



Ethiopian farm

farmers sell to small traders who sell to brokers who sell to exporters - has little incentive for better quality. There is no way for a price signal or even information on better management practices to get through the chain. Neither farmers nor traders are rewarded with higher prices for producing or buying pea beans of uniform size or high nutritional quality.

Contracts

Large buyers like to establish contracts in the beginning of the growing season for supplying seed, and buying the grain grown from that seed. But in this time of rising prices the farmer cooperatives and unions sometimes break contracts and ask for the new higher market price, refusing to deliver at the contract price. These farmer groups do not value the risk-sharing aspect of contracts - that they won't capture all the price increase if prices go up, but they are protected from large losses if prices go down.

Market information

Though everyone on the production side is very excited and expects prices to continue increasing, the farmers, traders, and cooperative managers say little about the international market in which they all compete. They don't talk

about the possibility of shooting past a competitive price point and crashing the market. Better systems of market price information through the chain need to be developed.

There are real opportunities to help set up good systems of price signals and clear communication of quality needs and supporting practices in the Ethiopian communities that grow, buy, process, and export white pea beans. Our goal is to move from short-term thinking where either the farmers maximize price (leading to overshoot and collapse of the market) or the exporters minimize price (leaving the farmer with no profit to invest in farm, family, and community) to developing business models that link the longer-term goals and knowledge of the exporters and farmers. We hope to create a more stable and profitable market for all involved and build the base for sustainable livelihoods in rural Ethiopia.

— Don Seville

¹Statistics from Population Reference Bureau (prb.org)



processing white pea beans

Mud Season and the Great Turning

This past January many of the Sustainability Institute staff joined several of the Donella Meadows Alumni Fellows and Cobb Hill Residents in a four-day workshop with Joanna and Fran Macy. Joanna and Fran teach *The Work that Reconnects* as a way to encourage awareness of our interconnectedness in the web of life and our authority to take action on its behalf. They have worked with many around the globe to find insight, solidarity, and courage to act, despite rapidly worsening conditions. Since I started at SI a year ago I heard about the previous workshop, held in 2006, at Cobb Hill and was eagerly awaiting the opportu-

nity to participate myself.

Joanna and Fran Macy design *The Work That Reconnects*, around a four-part spiral that cycles through gratitude, honoring our pain for the world, seeing with new eyes, and going forth. The spiral journey offers guidance and strength to all through the major revolution called *The Great Turning* - the shift of society from an Industrial Growth Society to a Sustainable Society.

Even as a young girl, I now realize, I was subconsciously connected to this



revolution and have always felt a desire to help accelerate this transition. It wasn't until college and my few years afterwards in the professional world that I've begun to fully understand the challenges, need, and urgency associated with such an overwhelming but necessary task.

During the workshop lead by Joanna and Fran, I discovered that feelings of isolation, despair and smallness are shared by so many of us in this field. In response to these feelings one particular story shared by Joanna hit home.

The story is a Tibetan Buddhist prophecy. I don't consider myself a Buddhist but this prophecy speaks beyond the lines of religious affiliation and brought a sense of comfort and camaraderie that I haven't experienced before. The prophecy foretells a time on earth when life is in great danger from dangerous weapons and technologies that lay waste to the world. This danger does not come from an evil deity or malevolent extra-terrestrial power. The danger is a result of our own choices and relationships. It is in this time when the Kingdom of Shambhala emerges in the hearts and minds of the Shambhala warriors who reach into the corridors of power where decisions are made and guarded. The warriors are not marked by insignia or uniform to identify themselves and they utilize only two weapons. The first weapon, compassion, moves us to act on the behalf of other beings and opens us to the world's pain. The second weapon is insight to realize that we are all interconnected so that each action undertaken brings consequences we cannot measure or see.

A vision of warriors armed with compassion and insight working their way into corridors of power to ultimately bring into being the Kingdom of Shambhala resonates so strongly for me that I've caught myself integrating the idea into how I view the world around me on several occasions.

I am one of the few New Englanders who prefers warm weather to cold and I make it a point to catch those brief and fleeting moments that suggest spring might in fact one day return. It was one of those moments that the Shambhala prophecy and the world around me collided. As I walked up to the Cobb Hill common house to get the mail one late winter afternoon I found myself zig-zagging my way around large mud puddles and blocks of ice and I smiled to myself about the hidden secret of New England's rarely marketed fifth season. Amid the picturesque landscape of cool spring fed ponds in summer, brilliant red and orange foliage, snow covered mountains, and fields of newly planted crops, is a short period few outside of New England are aware of. It is a time of year when warm weather begins to return and the dirty white snow begins to melt on the already saturated ground, forming what many locals know as Mud Season.

During Mud Season a whole separate set of driving skills is required to navigate the dirt roads of New England. The once frozen ground becomes an obstacle course of deep ruts formed by previous travelers. A battle is launched between driver and ruts as to the direction the car will travel. As the driver slows down it's possible for her to gain an advantage and the ruts become crossable. Ultimately the driver makes a safe passage in the direction of her choosing. However, if the driver approaches with too much speed, the ruts quickly assume control and the seemingly soft mud edges of the ruts form walls of concrete hurling car and driver to the opposite side of the road or worse yet the roadside ditch!

Now how anyone could relate a muddy road in early spring to the unprecedented challenges of transitioning to a Sustainable Society is I admit somewhat strange and perhaps an indicator that a vacation is needed, but on my walk that late winter afternoon I found my mind wandering in just that direction.



Joanna Macy

I played with the idea of the dirt road being the Industrial Growth society, while up ahead lies a Sustainable Society. The ruts are the systems currently in place, "business as usual approaches" to making progress, while the driver is a Shambhala Warrior doing everything in her power to slow down the car enough to avoid become stuck in the ruts and continue making progress down the road.



dirt road during Mud Season in New England

This vision gives me comfort and a sense of direction.

Instead of being one lonely driver, I find myself surrounded by thousands of drivers all with the same intention of slowing down, of questioning the benefit and very existence of some current societal codes and norms. We do this so we may all safely navigate a road

toward a Sustainable Society in spite of the forces pushing us off course. With that picture in mind, I find hope that, like mud season, the resistance and challenges now so formidable will soon begin to dry and level out, making

way for a clear path toward a society that doesn't need to worry about the dangers we've brought upon ourselves. Although I can't always identify my companions on the road or see the long-term progress because I'm focused on the

current challenge, together we are staying on course with the hope that it's not too late.

-Erin Sterner

Four Climate System Myths

Constructive Subversion

Some conventional wisdom about our climate system isn't matching what we're learning from our work in this field. And, given the recent headlines about the severity of the climate change - e.g., loss of polar sea ice, continued emissions growth, limitations of the biofuels solution - accurate understanding of our situation really matters. So, in the spirit of construction subversion, we'll share our top four myths.

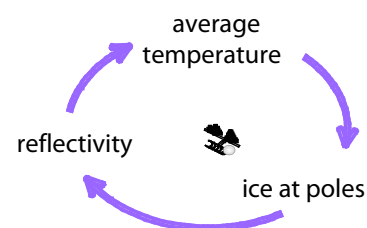
Myth Number 1: We can always fix things later

Imagine that you are running along the top of a hill with a huge tire. The further the tire rolls down the hill, the harder to stop it.

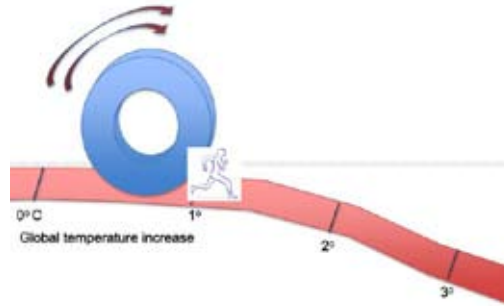
Earth's temperature behaves somewhat like this tire: the more temperature rises, the more it will continue to rise on its own. For example, more warming means less polar ice, which means more exposure of heat-absorbing oceans, which means even more warming. In another example, warmer oceans release more of their CO₂, leading to more warming.

We need to halt temperature increases before passing "tipping points" beyond which warming will continue on its own even if human beings stop producing greenhouse gasses. We need to stop the tire before its momentum makes it unstoppable.

Notice how the climate system differs from others we are more accustomed to. In these cases the "tire" is rolling



on relatively flat ground so we can pull it back. Bad air quality in your city? Reduce nitric oxide and sulfur dioxide emissions and smog soon lessens. Too much water pollution? Dump less sewage and the waterway quickly recovers. Global warming is different. It's not only about avoiding effects that can be



quickly undone. It's also about avoiding a locked-in path into the future.

**Myth Number 2:
We just need to level emissions**

Recently, an environmental studies professor published an editorial in a local newspaper, arguing for increased efforts to avert global warming. She wrote, "Avoiding the worst predicted consequences will require keeping our emission levels flat rather than growing over the next fifty years."

But aiming for "flat" emissions is not enough.

CO₂ concentration in the atmosphere are like a bathtub, filled by society's emissions and drained by removals into plants, soils, and oceans. If more water is flowing in than is flowing out, the level of water in the bathtub will always increase.

Right now the inflow is twice as big as the outflow, so "keeping emission levels flat", while a good first step, would continue to increase CO₂ concentration well beyond the levels required to avoid the 'locked-in path to the future' we have just described.

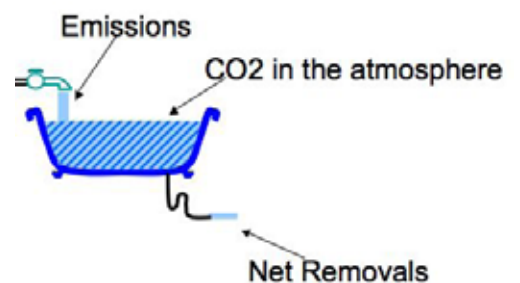
Stabilizing atmospheric CO₂ will require

a 50-80% drop in emissions from the current level, down to the point where emissions equal removal, where the inflow to the bathtub equals the outflow. On top of that, recent evidence, such as the severe melting of Arctic sea ice this summer, is leading some experts to say that CO₂ levels in the atmosphere are already dangerously high. We likely need levels of CO₂ in the atmosphere to fall, requiring us to reduce emissions (the inflow) below net removals (the outflow).

**Myth Number 3:
Such large reductions in emissions are unimaginable**

Reductions of emissions of 80% or more can seem daunting, especially when we consider that we citizens of the rich world, having produced a much larger share of total greenhouse gas pollution, have a responsibility to make even bigger cuts than the global average.

While we shouldn't take this task lightly, it is important to recognize that we can take advantage of many potentially powerful "reinforcing feedback loops" - tires rolling down hill - to help us accomplish the needed deep reductions.



For example, sales of technologies for energy efficiency and renewable energy leads to technological improvements, greater economies of scale, and falling prices, which lead to more sales. More sales attract new players into the market, bringing more sales. People committed to lower-carbon lives and organizations infect others with their "idea virus" and send them to infect even

more. These people take action, gain experience, and improve their approaches, leading to more emissions reduction and more experience.

Powerful feedback processes such as these have improved air quality in many cities, shifted societal attitudes toward public smoking, and driven a boom in information technology, all much faster than conventional wisdom (and we ourselves) thought possible.

The early signs of such reinforcing feedback are all around, if you look for them, and include exponential growth in wind and solar energy generation, community-based climate protection organizations, organic food sales, and more.

**Myth Number 4:
Averting climate change is primarily a technological challenge**

Promising as it is, the growth in technological emissions-reducing solutions is not yet on track to halt the growth in greenhouse gas emissions. In the

end, the results of the race between problem and solutions will be determined not just by the cleverness of the engineers and policy makers, though we

need their skills badly, but also by the ability of all of us to bring our whole selves to the challenge. Can we use art, drama and poetry to bust some of these myths and spread the seeds of solutions faster? Can we co-operate across boundaries of class, race, and national borders to share solutions? Are we willing to try new things, and step into uncertainty to launch some of the most promising solutions? Can we define the purposes of our economies, our organizations, and our own lives in ways that sustain life?

These questions mean that the ultimate trajectory of our Earth's climate is in all of our hands, and that there is plenty of room for all of us to work together to propel forward self-reinforcing cycles of solutions.

-Andrew Jones
Beth Sawin

<i>Conventional wisdom suggests...</i>	<i>But really....</i>
We can always fix things later.	Because of delays in the system and the way that warming leads to more warming, we need to act now before changes are locked-in.
Leveling out emissions should be enough to stabilize the climate.	We need to bring emissions down below the level of removals; that means cut 80% of current emissions.
Achieving sufficient emissions reductions is unimaginable.	The seeds of solutions are already in place and growing exponentially
Averting climate change is a technical problem	Climate change is a human problem calling on our full capacities for response.

climate myths summary

What's New:

- Donella Meadows Leadership Fellows Alumni Workshop with Joanna and Fran Macy was held at Cobb Hill in Hartland, Vermont in January. Read the report at: www.sustainer.org/fellows/reports.html
- New Food Lab project starting - New Business Models for Sustainable Trading Relationships. Read the announcement at: www.sustainablefoodlab.org/article/articleview/19405/1/2370
- SI's Climate Interactive program will hold two public webinars on our "System Dynamics and Web 2.0 Approach to Addressing Climate Change" on March 12 from 2-3 and March 17 from 12-1 EST. We'll play with climate sims. Check the "What's New" area of the SI website -- sustainer.org -- for details coming soon.



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Notes from the Past...

Myth 8.

The greenhouse effect is a problem of the rich countries/poor countries/capitalist countries/communist countries. This is the favorite international political myth, a convenient way of shifting responsibility around the world. We point to the Brazilians burning their forest, they point at us wasting energy. Western Europe points at inefficient coal-burning in Eastern Europe (while the West Germans could save 26 million tons of CO₂ emissions a year just by putting a speed

limit on their Autobahns). Everyone looks nervously at China's plans to burn its huge deposits of coal. The Third World says it really has more immediate problems than some future climate change. We all suggest that someone else go first.

If there was ever a problem the whole world has together, this is it. If we let it proceed full-scale, climate change will affect everyone, and the effects will be devastating. There will not be winners and losers, only losers to various degrees. Without a sense

of global responsibility and justice, we will make a hash of this challenge. And we will get only one chance, and only over the next decade or two.

Frankly, I would see no hope, if it weren't for the fact that the steps we need to take are possible, affordable, and beneficial. It's not a matter of allocating unbearable costs, but of building a more efficient, less polluted world -- a world worth building, greenhouse effect or no greenhouse effect.

There is a greenhouse

effect, though, to push us toward environmental maturity. It's very real. So far only a small amount of it is inevitable. Probably the greatest and most dangerous myth we could create about it is to call it a matter of destiny, rather than a matter of choice.

— Donella Meadows,
"Greenhouse Myths,"
(10/03/1989)