

Sustainable Development

A Geographic Perspective



Today I am going to talk about the basics of sustainability:

1. From an academic perspective –
“some jumping off points”
2. List some video resources
3. Case study from China



Sustainability

A. Top 10 Myths about Sustainability



Top 10 Myths about Sustainability: Which Do You Believe?

SCIENTIFIC AMERICAN

Earth3.0

POWER
UP THE
GRID!
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Solutions for Sustainable Progress

Obama's Climate Challenge

How 2009 Will
Make or Break
His CO₂ Strategy

Biofuels

The Next
(and Better)
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Arctic Landgrab

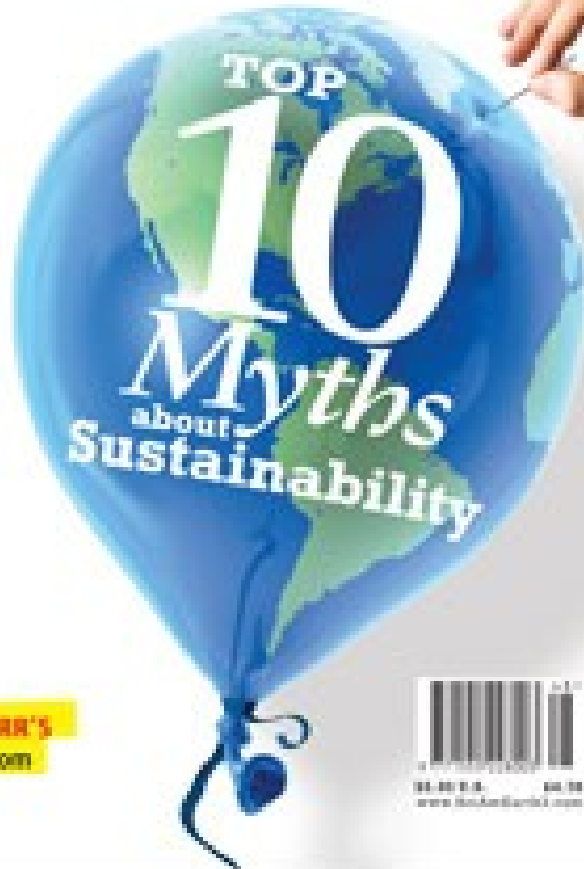
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Triggers a Race
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Sustainability

When a word becomes so popular you begin hearing it everywhere, in all sorts of marginally related or even unrelated contexts, it means one of two things. Either the word has devolved into:

1. A meaningless cliché, or
2. It has real conceptual heft.



Sustainability

“Green” (“going green”) falls squarely into the first category.

Green Wash





GO GREEN





JAPANESE CULTURAL CENTER OF HAWAI'I

going green

Sustainability

What exactly does it mean to

Go Green???



Going green
makes sense...

...doesn't it?



Sustainability

But “sustainable,” which at first conjures up a similarly vague sense of environmental virtue, actually belongs in the second.

It has real conceptual heft.



Sustainability

Despite its simplicity, however, sustainability is a concept people have a hard time wrapping their minds around.



Sustainability

The Top Ten Myths



Myth 1:

**Nobody knows what
sustainability really
means.**



Myth 1: Nobody knows what sustainability really means.

That is a Myth –

What is sustainability?

Write a sentence or two about what sustainability is.



Sustainability

If you could give one word –
what would that word be?



Sustainability

For me it is the Word:
Enduring
which best sums it up.



Myth 1: Nobody knows what sustainability really means.

That's not even close to being true. By all accounts, the modern sense of the word entered the lexicon in 1987 with the publication of *Our Common Future*, by the United Nations World Commission on Environment and Development.

(also known as the Brundtland commission after its chair, Norwegian diplomat Gro Harlem Brundtland).



Click to **LOOK INSIDE!**



OUR COMMON FUTURE

THE WORLD COMMISSION

ON ENVIRONMENT

AND DEVELOPMENT

Our Common Future aimed to discuss the **environment & development** as one single issue.



Our Common Future aimed to discuss the ***environment & development*** as one single issue.

We all understand “environment”
Going Green!

But what is meant by Development?



Development

From Wikipedia, the free encyclopedia

Development may refer to:

Land use

[edit]

Wiktionary
Free
Dictionary
Wiktionary
Wiktionary
Wiktionary

Look up *development* in
Wiktionary, the free dictionary.

- **Green development**, a concept that includes consideration of community-wide or regional environmental implications
- **Land development**, altering the landscape in any number of ways
- **Mixed-use development**, the practice of allowing more than one type of use in a building or set of buildings
- **Real estate development**, a business encompassing activities from renovation to the purchase of raw land
- **Subdivision (land)**, or a **development**, a piece of land divided from a larger portion for sale or further development
- **Urban planning**, or **development**, integrates land use planning and transportation planning to improve communities
- **Transit-oriented development**, a mixed-use residential or commercial area designed to maximize access to public transport

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- 1 Land use
- 2 Science and technology
- 3 Social science
- 4 International and regional
- 5 Business and professional
- 6 Music
- 7 Other

Science and technology

[edit]

- **Artificial development**, an area of computer science and engineering
- **Development (differential geometry)**, the process of rolling one surface over another
- **Development (journal)**, an academic journal in developmental biology
- **Development (topology)**, a countable collection of open coverings
- **Drug development**, the entire process of bringing a new drug or device to the market
- **Embryogenesis**, or **development**, the process by which the embryo is formed
- **Energy development**, the effort to provide sufficient primary energy sources
- **Human development (biology)**, the process of growing to maturity

Development:

Some see it as growth (more Cars sold)

Others as progress, improving the human condition (more teachers, dentists, etc.)



environment & development

Have merged into sustainable
development.....



After the publication of the report (*Our Common Future*), the use of the terms: “Common Future” and “Sustainable Development” are now common.



Section



Sustaining Our Common Future

Chapter 10 **From the Periphery to the Core of
Decision Making – Options for Action**

One of the main points of the
“Sustaining Our Common Future”
report:

“Many of the same causes of
these environmental problems
simultaneously underpin
entrenched poverty and over
consumption.”







UN Documents
Gathering a body of global agreements



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**Report of the World Commission on Environment and
Development: Our Common Future**

Transmitted to the General Assembly as an Annex to *document A/42/427 -
Development and International Co-operation: Environment*

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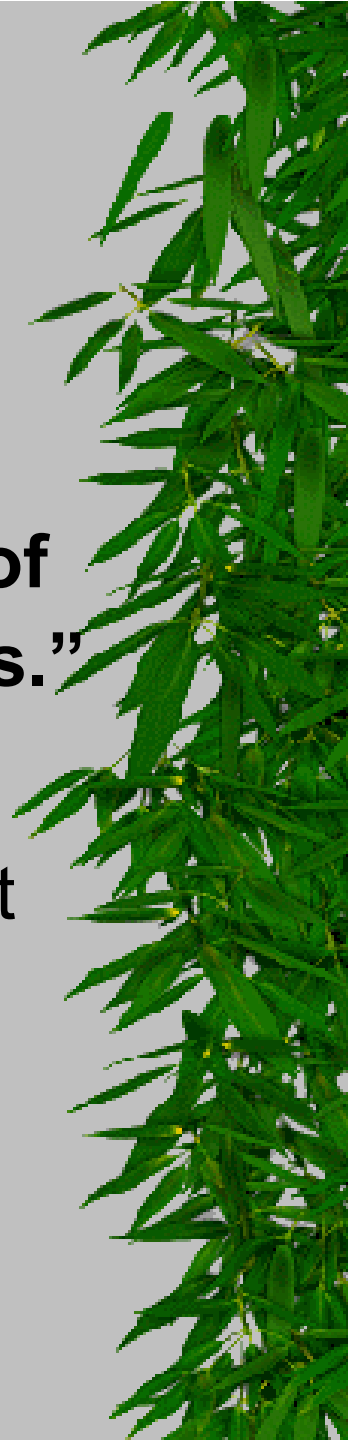
I. Symptoms and Causes

II. New Approaches to Environment and Development

Sustainability

The Brundtland report (Our Common Future) defined sustainable development as **“development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”**

Note that the definition says nothing about protecting the environment, even though the words “sustainable” and “sustainability” issue mostly from the mouths of environmentalists. That point leads to the second myth....



Sustainability

What is sustainability?

<http://www.youtube.com/watch?v=B5NiTN0chj0>



Myth 2:

**Sustainability is all
about the environment.**



Sustainability

The sustainability movement itself—not just the word—also dates to the Brundtland commission report. Originally, its focus was on finding ways to let poor nations catch up to richer ones in terms of standard of living.



Sustainability

That goal meant giving disadvantaged countries better access to natural resources, including water, energy and food—all of which come, one way or another, from the environment.

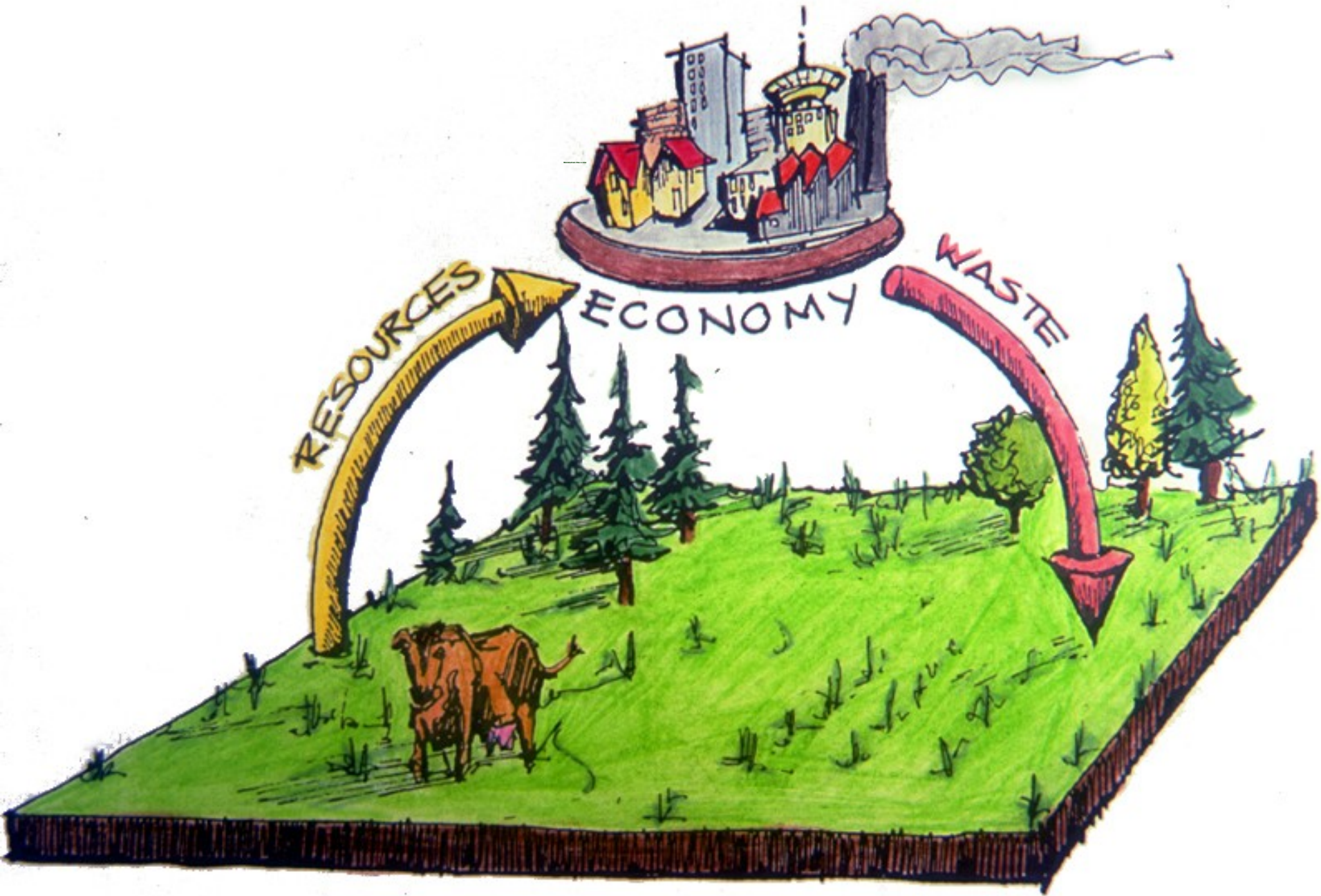
But it transformed into an environmental term because



Sustainability

The economy is a wholly owned subsidiary of the biosphere. The biosphere provides everything that makes life possible, assimilates our waste or converts it back into something we can use.



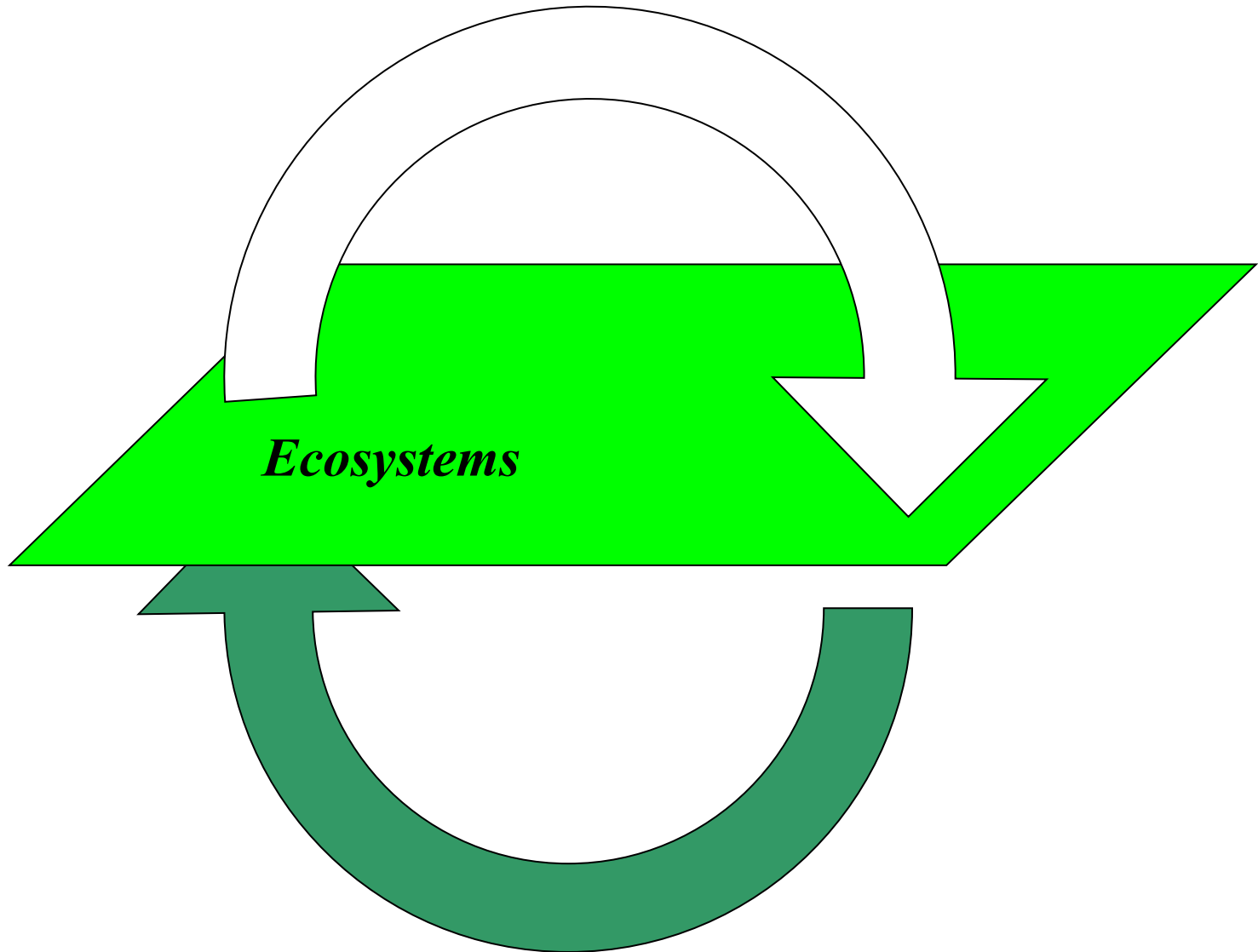


Sustainability

If too many of us use resources inefficiently or generate waste too quickly for the environment to absorb and process, future generations obviously won't be able to meet their needs.



Organism's metabolism: food in, waste out.



Nature turns waste back into food

Sustainability

The idea that the environment is the underpinning of our survival leads us to the next Myth.....



Myth 3:

**“Sustainable” is a
synonym for “green.”**



Sustainability

Although there's a fair amount of overlap between the terms, "green" usually suggests a preference for the natural over the artificial. With some six billion people on the planet today, and another three billion expected by the middle of the century, society cannot hope to give them a comfortable standard of living without a heavy dependence on technology and things like genetically altered food products.





Sustainability

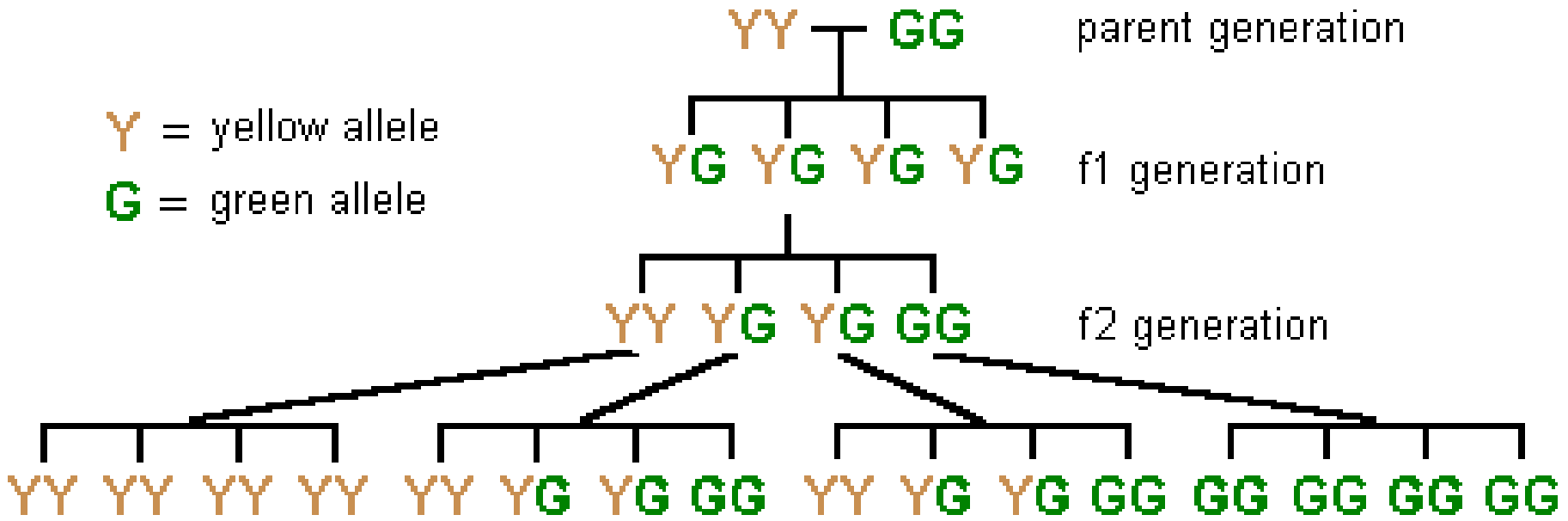
Genetically modified foods – are they sustainable? Should we produce them?

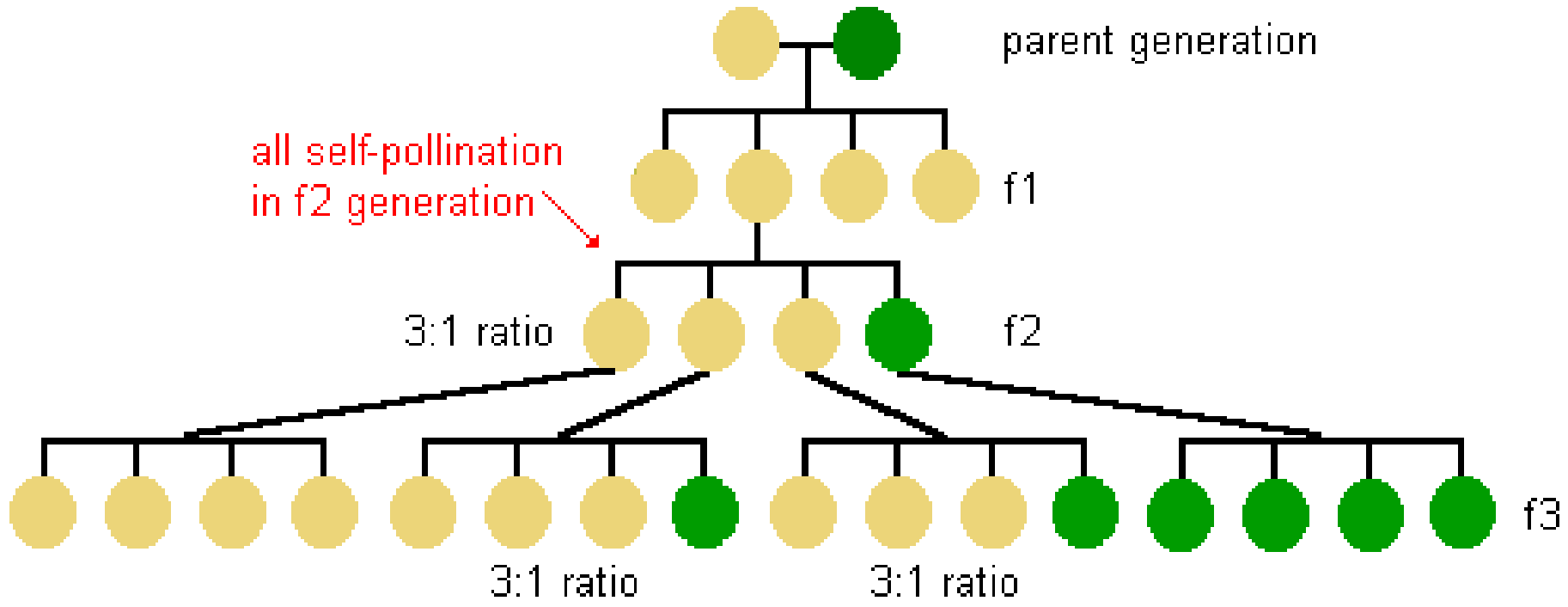
Pro & Con groups.



Gregor Mendel 1822-1884







Sustainability

Genetically modified foods

<http://www.youtube.com/watch?v=jAP6ZtfP9ZQ>

GMF EU

http://www.youtube.com/watch?v=B8p7M0WF_7A



Sustainability

Genetically modified (GM) foods are foods derived from genetically modified organisms. Genetically modified organisms have had specific changes introduced into their DNA by genetic engineering techniques. These techniques are much more precise than mutagenesis (mutation breeding) where an organism is exposed to radiation or chemicals to create a non-specific but stable change. Other techniques by which humans modify food organisms include selective breeding. From Wikipedia

1/8/2010





Sustainability

What criteria do we need to make a sustainable dandruff shampoo?



Sustainability

Selenium – element – can be natural or synthetically made.

For dandruff shampoo world-wide natural supple would be gone in two years if no synthetics were used.



Sustainability

Myth 4: It's all about recycling.



Sustainability

I get that a lot,” says Shana Weber, the manager of sustainability at Princeton University. “For some reason, recycling was the enduring message that came out of the environmental movement in the early 1970s.” And of course, recycling is important: reusing metals, paper, wood and plastics rather than tossing them reduces the need to extract raw materials from the ground, forests and fossil-fuel deposits.



Sustainability

The most important areas by far in terms of sustainability are energy and transportation.” If you think you are living sustainably because you recycle, she says, you need to think again.



Sustainability

Friend with Prius

Our whole lives – Ecological Footprint

Stuff [The Story of Stuff](#)

Toilet seat

<http://www.newyorker.com/online/video/2008/10/06/081006> logging

Life Cycle analysis



Sustainability

Myth 5: Sustainability is too expensive.



Sustainability

If there is an 800-pound gorilla in the room of sustainability, this myth is it. That's because, there's a grain of truth to it. But only a grain. It's only true in the short term in certain circumstances, but certainly not in the long term.



Sustainability

Because we already have an unsustainable system in place, we have to spend some money up front to switch to a more sustainable technology and way of life.

The Pentagon is determined to cut its energy use by a third, both to save money and to reduce its dependence on risky foreign oil supplies.

#1 vulnerability on Afghanistan



October 9, 2010: 150 Oil Tankers burn



Sustainability

It is commonly assumed that going green will rack up the costs of a building project, but a unique study contradicts that view.

Reaching the highest standards does incur costs, but careful consideration of designs and specification at an early design stage can present significant savings compared with an **ad-hoc approach**.

Example – Swampscott High School –

Gym Light bulbs / Total Energy use /

Lights



Sustainability

More sustainable ways of doing things usually costs less over the lifetime of a product or service. It is the upfront costs that can be higher (cheaper material – cheaper in more ways than one).



Sustainability

Myth 6: Sustainability means lowering our standard of living.



Sustainability

Not at all true.

It does mean that we have to do more with less.

It does not mean that we have to go back to the Stone Age – Jeff Jacoby



Sustainability

Once we start to organize ourselves and innovate, the breakthroughs are extraordinary.

They will allow us to use resources more productivity, which in turn allow us to be prosperous, fed, entertained, secure.

The innovation at the heart of sustainable living will be a powerful economic engine.

Sustainable Italian town

<http://www.youtube.com/watch?v=60TajY6bAT4>



Sustainability

Myth 7: Consumer choices and grassroots activism, not government intervention, offer the fastest, most efficient routes to sustainability.



Sustainability

Popular grassroots actions are helpful and ultimately necessary. But progress on some reforms, such as curbing CO2 emissions, can only happen quickly if central authorities commit to making it happen. That is why tax credits, mandatory fuel-efficiency standards and the like are pretty much inevitable.



Sustainability

That conclusion drives free-market evangelists crazy, but they operate on the assumption that wasteful use of resources will drive up costs and people will stop the activity.

Is that true? Pro vs. Con

Free Market vs. Government



Sustainability

To cite just one example, economic devastation is very likely under even the mildest plausible climate change scenarios, in the form of disruptions to agriculture from shifts in rainfall patterns and growing zones; densely populated coastal areas will be rendered unlivable as sea level rises, and so on.



Sustainability

Yet the price currently being charged to people who add greenhouse gases to the atmosphere is zero. Putting a per-ton tax on carbon emissions would be wildly unpopular, but it would for the first time account for the real costs of unsustainable energy use.

We know that the climate is changing and it is due to human activity. We know that there will be problems – by waiting – it will only get more costly.



Sustainability

Free-market purists also argue that with respect to the depletion of natural resources, rising prices will automatically push people into more efficient behavior. But we do not have a free market – our Military makes sure that there is a free flow of oil. Our taxes pay for environmental cleanup- not the resource use causing the problems.

Finance - externalities

<http://www.youtube.com/watch?v=Pj0WRGZBX6M>



Sustainability

Still, rising energy prices have had the effect of again galvanizing research into wind, solar and other alternatives—and if you leave economic disruption aside, we can at least count on car companies to make more efficient vehicles and on utilities to find more sustainable sources of energy. It creates innovation!

But that outcome may reflect another myth.....



Sustainability

**Myth 8: New technology
is always the answer.**



Sustainability

Not necessarily.

During his presidential campaign, Barack Obama made the tactical mistake of pointing out that proper tire inflation could save Americans millions of gallons of gasoline through better fuel economy. The Republicans ridiculed him, just as they did President Jimmy Carter for appearing on TV in a sweater during the energy crisis of the late 1970s. Both Carter and Obama were right.



Sustainability

Myth 9: Sustainability is ultimately a population problem.



Sustainability

This is not a myth, but it represents a false solution.

Every environmental problem is ultimately a population problem. If the world's population were only 100 million people, we would be hard-pressed to generate enough waste to overwhelm nature's cleanup systems. We could dump all our trash in a landfill in some remote area, and nobody would notice.



Sustainability

Population experts agree that the best way to limit population is to educate women and raise the standard of living generally in developing countries. But that strategy cannot possibly happen quickly enough to put a dent in the population on any useful timescale. The U.N. projects that the planet will have to sustain another 2.6 billion people by 2050. But even at the current population level of 7 billion, we're using up resources at an unsustainable rate.



Sustainability

Bangladesh issue



Sustainability

Myth 10: Once you understand the concept, living sustainably is a breeze to figure out.



Sustainability

All too often, a choice that seems sustainable turns out on closer examination to be problematic.

Probably the best current example is the rush to produce ethanol for fuel from corn.

What is the issue with Ethanol?



Sustainability

Corn is a renewable resource—you can harvest it and grow more, roughly indefinitely. So replacing gasoline with corn ethanol seems like a great idea.

Until you do a thorough analysis, that is, and see how energy-intensive the cultivation and harvesting of corn and its conversion into ethanol really are.



Sustainability

One might get a bit more energy out of the ethanol than was sunk into making it, which could still make ethanol more sustainable than gasoline in principle, but that's not the end of the problem. Diverting corn to make ethanol means less corn is left to feed livestock and people, which drives up the cost of food.



Sustainability

That consequence leads to turning formerly fallow land—including, in some cases, rain forest in places such as Brazil—into farmland, which in turn releases lots of carbon dioxide into the atmosphere. Eventually, over many decades, the energy benefit from burning ethanol would make up for that forest loss. But by then, climate change would have progressed so far that it might not help.



Sustainability

You cannot really declare any practice “sustainable” until you have done a complete life-cycle analysis of its environmental costs. Even then, technology and public policy keep evolving, and that evolution can lead to unforeseen and unintended consequences. The admirable goal of living sustainably requires plenty of thought on an ongoing basis.



Sustainability

The Business case

<http://kaujalgi.wordpress.com/2008/07/02/the-business-case-for-sustainability-a-youtube-video/>

Ray Anderson - the way of the plunderer

<http://www.youtube.com/watch?v=1uoRe9vOzec>



Sustainability

Different Power Points on the Web....



There are many shades of green.



Each of us brings our own shade of green
to the effort.

Together, we can make the world a better
place.

Pillars of Sustainable Development

- ★ Economic Development – poverty eradication
- ★ Social Development – active participation of women; education; good governance
- ★ Environmental Protection – prevent environmental degradation and patterns of unsustainable development

At the local, national, regional, and global levels



The notion of capital in sustainable development.

There is:

- 1) Economic Capital,**
- 2) Social Capital,**
- 3) Environmental Capital**



Environmental Capital

While it is possible that we can find ways to replace some natural resources, it is much more unlikely that they will ever be able to replace eco-system services, such as the protection provided by the ozone layer.



Environmental Capital

Think of Forests (their capital is their functioning ecosystem – while their interest is what they do for us).

Forests, for example, not only provide the raw material for paper (which can be substituted quite easily), but they also maintain biodiversity, regulate water flow, and absorb CO₂.



Market failure

If the degradation of natural and social capital has such important consequence the question arises why action is not taken more systematically to alleviate it.

While the benefits of natural or social capital depletion can usually be privatized the costs are often externalized. Natural capital is also often undervalued by society because like forests, we don't put a price on CO₂ sequestering.



Action Agenda – Focus on Five Key Thematic Areas (WEHAB)

Priority areas for action, identified by UN Secretary-General Kofi Annan:

- ★ Water and sanitation
- ★ Energy
- ★ Health
- ★ Agriculture
- ★ Biodiversity protection and ecosystem management



SUSTAINABILITY....

- ...IS NOT ABOUT A DESTINATION
- ...IT IS SIMPLY A DIRECTION



Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity.



★ **SUSTAINABILITY IS A TRANSITION**

★ **From:**

★ **short-term thinking**

★ **an economy
outside of nature**

★ **a linear flow
of resources**

★ **fossil fuels**

To:

long-term thinking

**economy integrated
with nature**

A system of Flows

Solar-derived Fuels



PBS movies – colleague Marcos Luna

- * Association for the Advancement of Sustainability in Higher Education. This organization does great workshops on integrating sustainability into the curriculum and they make some of their materials freely available.
<http://www.aashe.org/>
- * Pew Climate Carbon Footprint Calculator
<http://makeanimpact.pewclimate.org/>
- * NPR It's All About Carbon
Great little animation explaining why carbon is affecting the climate
<http://www.npr.org/templates/story/story.php?storyId=9943298>



PBS movies – colleague Marcos Luna

- * PBS "Transport: Food Miles"

How are fossil fuels used to produce food? Why is this good and why is this a problem? Why is the distance that food travels an issue? Is the local food movement a significant approach?

- * <http://video.pbs.org/video/1362891727/>

- * PBS "Affordable Green Housing"

New York City is known for its diversity, but that quality isn't always reflected in its public housing developments, which often ignore the social and cultural characteristics of the communities who live in them. This episode follows developer Jonathan Rose through Irvington, Harlem and the Bronx - communities where Rose is putting sustainability within reach of public housing residents.

- * <http://video.pbs.org/video/1144710648/#>



PBS movies – colleague Marcos Luna

- * PBS "Architecture 2030"

Buildings are responsible for almost half of all greenhouse gas emissions in the United States. Can a collaborative effort - government leaders, architects, regulatory agencies and building suppliers - avert a climate crisis through policy change and education? Architect-turned-activist Ed Mazria may have the answer.

- * <http://video.pbs.org/video/1094055821/#>

- * PBS "Green Builders"

Green building pioneers are making their part of the "built environment" a more energy-efficient and environmentally friendly place. Each project is a proving ground.

- * <http://video.pbs.org/video/1088152802/>



PBS movies – colleague Marcos Luna

- * PBS "Saved by the Sun"

Solar has been around for a while. Why has it taken so long to take off? Why haven't consumers adopted solar technology for their homes despite all of the longterm and tax advantages? - What are the advantages and disadvantages of solar energy technologies? What are the barriers to greater adoption of solar technology? - What are some of the ways in which solar energy is collected? - Is a "Solar Renaissance" underway?

- * <http://video.pbs.org/video/980039287/>

- * PBS "Cleaning Coal"

What proportion of the nation's coal comes from Wyoming? What is meant by 'clean coal'? Is it clean? How does the coal industry propose to deal with carbon dioxide? What are the hurdles to controlling carbon dioxide?

- * <http://video.pbs.org/video/1115809446/>



PBS movies – colleague Marcos Luna

- * PBS “Coal & Nuclear: Problem or Solution?”
* <http://video.pbs.org/video/1362880093/>
- * PBS "A Nuclear Rebirth in the U.S.?" What are the arguments for and against a revival of federal support for nuclear energy? Which do you find most compelling and why?
* <http://video.pbs.org/video/1416447592/chapter/3/>
*
*
* PBS "Crash: A Tale of Two Species"
This is the story of the fabric of life, and how all species are connected. At its center is the horseshoe crab, a creature that has remained virtually unchanged for eons. Its annual spawning produces millions of eggs that are the lifeline for a tiny bird, the red knot. But horseshoe crab numbers are plummeting, and the pyramid depending on this age-old creature is about to come crashing down.
* <http://video.pbs.org/video/1200406235/>



China Case Study

★ Cao Hai

