Biochar

Now More than Ever

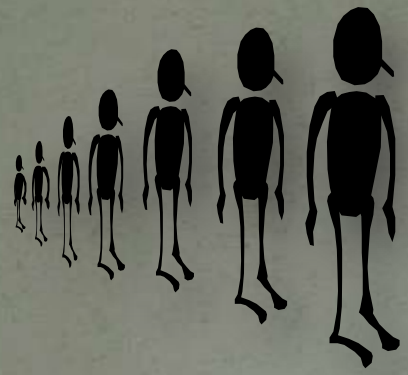
There are a lot of fans out there…

…and a lot of stuff that's hitting them NOW

Quadraplex of crises

(Talk about being smacked upside our heads!)

POPULATION



BOOM!

PEAK OIL

NO $

CLIMATE CHANGE

PEAK OIL
MANDATORY GROWTH
NO $
CLIMATE CHANGE

Under Attack

Lithosphere:

- Soil compaction
- Soil acidification by over-application of chemicals
- Insufficient filtration, capture and remediation of toxins »» poisoned lands
- Excessive removal and use of fossil fuels for energy
- Water quality compromised by excessive run-off of chemical fertilizers and industrial pollutants

Biosphere:

- Plant productivity compromised by
  - deranged climate
  - weather extremes
  - loss of soil productivity
- Reduced quality and quantity of fish and wildlife habitat and of croplands
- Excessive waste accumulation

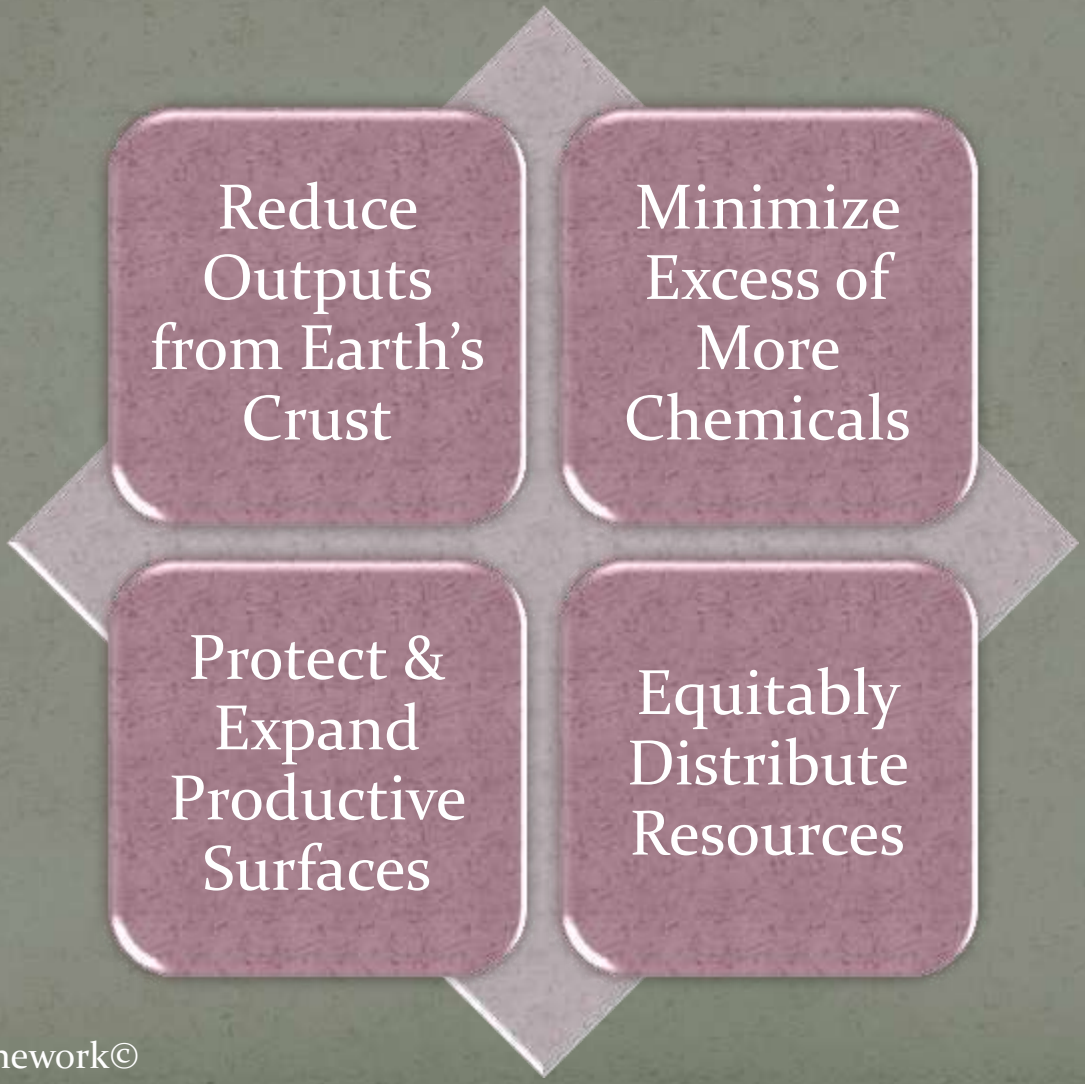
Atmosphere:

- Excessive build-up of atmospheric carbon dioxide and other greenhouse gases (GHG's)
- Production of energy and industry trumps protection of atmosphere
- Overwhelming natural remediation processes with speed and volume of pollution and GHG's

Human-sphere:

- Lack of productivity = less food equitably distributed or widely available
- Conversion of productive forests and cropland to development
- Lack of sustainable, affordable, efficient clean energy
- Centralized corporate models minimize decentralized, distributed economic opportunities

Principles of Sustainability*



*The Natural Step Framework©

We need sustainable solutions, intelligently applied.

NOW.

Biochar.

It's not the only solution…

…and it's not snake oil.

But it is one brilliant solution…

Theoretical Origins of Biochar

- Observing greater plant growth in areas that included charcoal concentrations
- Copying what nature was already doing - biomimicry
- Implementing methodically to enhance the productivity of food for the community
- Biochar becomes part of the commons and the practice spreads

What are the Commons?

A set of assets that are all 'gifts' and all shared, by an identified group for identified purposes.

- Inclusive
- 'Highest good' prevails
- Sustainability imperative
- Legacy value for future generations
- Commoditized and non-commoditized

Biochar and The Commons

- Biochar is part of the human commons – accessible, broadly applicable, scalable
- Biochar contributes to & supports ecosystem services
- Biochar can respond to and enhance remediation and reclamation work
- Biochar can ameliorate some of the impacts of climate change
- Biochar can create distributed jobs and enhance local economies
- Biochar can increase the probability that the more people will have more food

Ecosystem Services

Cornucopia of Riches

Air and Water

- Produces O_2
- Sequesters CO_2
- Filters fine particulates
- Absorbs toxins
- Supplies fresh water
- Filters water
- Retains snowpack
- Controls run-off
- Replenishes aquifers

Biochar Services

- **Encourages plant growth increasing uptake of CO_2 & release of O_2**
- **Adsorbs toxins**
- **Filters water**

Photo by Rick Graetz©

Soils & Habitats

- Builds soil
- Sequesters carbon
- Cycles nutrients
- Grows food & fiber
- Supports microbes & fungi
- Creates self-sustaining habitats
- Modifies micro-climate
- Provides shelter
- Stabilizes slopes

Biochar Services

- **Amends soil**
- **Sequesters carbon**
- **Attracts & holds water**
- **Attracts & holds nutrients**
- **Reduces GHG off-gassing**
- **Supports microbes & fungi**

Special Tricks

- Pollination
- Decomposition and recycling of waste
- Conversion of energy from the sun to matter!

Biochar Services

- Thermal conversion and recycling of waste
- Release of energy from matter created by the sun!

Human Services

Biochar's contribution to social systems

Biochar in the Human-sphere

- Non-discriminatory: producers, users
- Scalable (technology, application sites)
- Affordable (depending on technology and scale)
- Diverse (feedstocks, uses)
- Best results and Life Cycle Assessment at local level
- Rewards:
  - Immediate – energy, heat, conversion of waste
  - Short term – soil enhancement, water retention, crop productivity
  - Long term – short term gains + carbon sequestration

Community Benefits

- Food security through improved soils
- Diverse, local, entrepreneurial small business opportunity
- Up-cycling waste to useful product
- Benefiting the local environment and economy
- Designing and building own equipment
- Marketing technology and/or product

We need to apply biochar as a sustainable solution.

NOW.

Thank you for caring. Thank you for being here.

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