Cooling the Planet with Biochar?

Will this reduce carbon dioxide in the atmosphere?

Biochar

The answer to climate change and soil depletion -

Or a new threat to climate and people, freshwater and soil?

The biochar lobby is thinking big

"By driving, you will be saving the planet. And the more you drive, the more you prevent catastrophic climate change."

Biopact (which runs the Biochar Fund)

"Biochar represents a cornerstone of our future global sustainability. With the appropriate political and technical recognition, promotion and adoption, it will change our world forever, and very much for the better."

Tim Flannery, keynote speaker at the 2008 International Biochar Initiative conference

What is biochar?

BEST Energies pyrolysis plant at Somersby, New South Wales

Biochar is charcoal, which is derived as a by-product if biomass is burnt without oxygen for energy (pyrolysis).

Biomass Pyrolysis

Dynamotive pyrolysis plant in Guelph, Ontario

Biomass is exposed to temperatures of 350 to 500^{o}C for short periods.
This turns it into it into bio-oil, syngas and residue charcoal.

Bio-oil and syngas can be used for heat and power or refined further into synthetic biodiesel.

Charcoal can be used as a fuel, or for industry – but selling biochar as a fertiliser could be far more profitable.

Terra preta and biochar - Facts

Terra preta – Amazonian Dark Earths, Brazil
www.fao.org/sd/giahs/other_brazil.asp

Terra preta is carbon rich and highly fertilesoil created by communities in Central Amazonia 500-2500 years ago.

It is characterised by

- highly diverse biomass residues (compost, manure, fish bones, animal bones, weeds, etc)linked to high agro-biodiversity;

- organic phosphorous and calcium additions;

- charcoal additions

FAO: The knowledge systems and culture linked to the Terra Preta management are unique but have unfortunately been lost.

Terra preta and biochar - Myths

Field installation for biochar trial,
Photo: C. Hyland,www.css.cornell.edu

Does this look like soil conservation by small farmers with high agro-biodiversity?

The biochar lobby wants us to trust that adding charcoal residue from industrial bioenergy production (pyrolysis) will **instantly** re-create terra preta almost anywhere in the world.

How credible is that?

What do we (not) know about biochar? 1

- “You would need 50 or 100 years to get a similar combination [to terra preta] between the stable charcoal and the ingredients" (Bruno Glaser, soil scientist);
- According to Johannes Lehmann, Chair of the International Biochar Initiative, there are no published studies that show that nutrients or carbon are retained in the soil. The longest experiments were four years and no results have been published.

What do we (not) know about biochar? 2

In boreal forests, biochar has been shown to increase microbial activity, leading to humus being decomposed and to the original soil carbon being released into the atmosphere.

Nobody knows how to incorporate biochar into the soil without increasing soil erosion, which would release more CO2.

Farmers as guinea pigs?

Biochar trial with maize, Colombia
www.css.cornell.edu

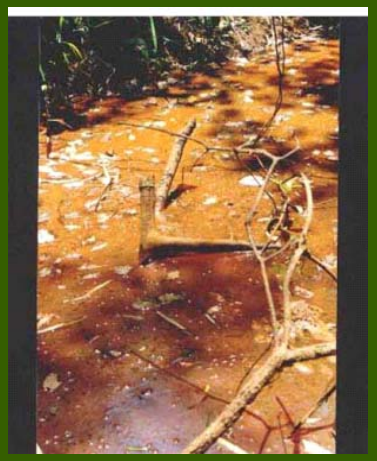
Industrial biochar is in the early research stages -

Yet the Biochar fund is persuading small farmers in Central Africa to implement its use. Similar 'projects' are likely to be going on elsewhere.

With the promise of lasting higher yields and and income.

Who will pay the price for failure,if the promises were wrong?

The reality of industrial charcoal production

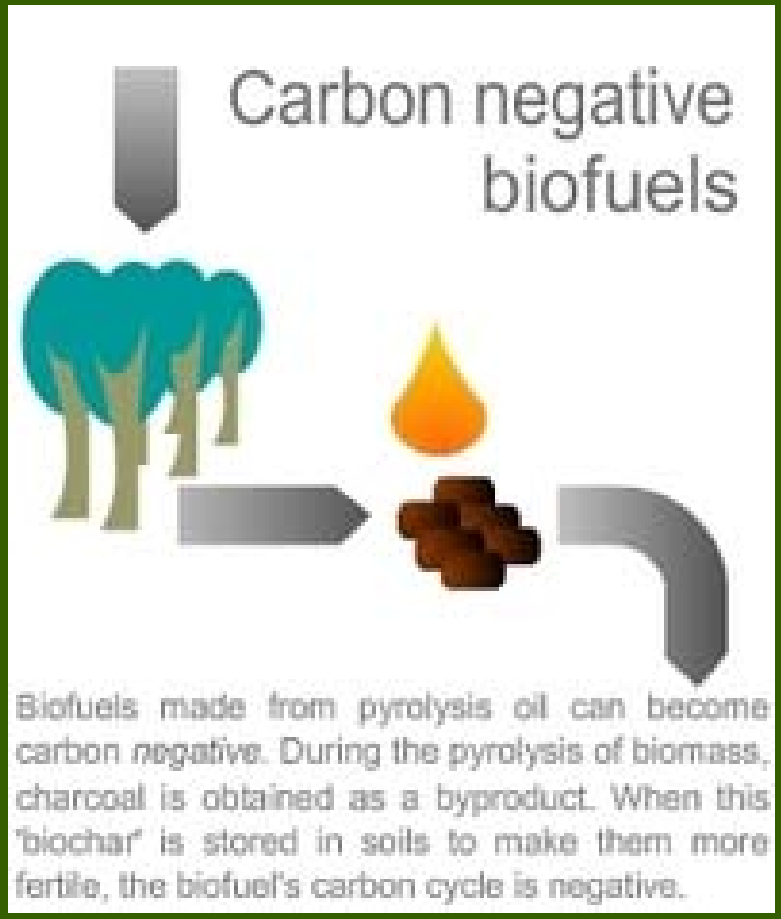


Plantar's eucalyptus plantations for charcoal as fuel for pig iron in Minais Gerais, Brazil:

Deforestation, Erosion,Water Pollution, Evictions

Photos: World Rainforest Movement, www.wrm.org.uy

The biochar blueprint: Unprecedented land conversion



www,biopact.com

"Biochar can take 6 million hectares of carbon out of the atmosphere every year"

Tim Flannery, keynote speaker at the 2008 International Biochar Initiative conference.

"Land use improvements on the scale envisaged – on average, and area the size of France in warmer regions and of Germany in temperate zones each year for 25 years – is a daunting organisationalprospect"

Peter Read, contributor to IPCC Assessment Report 4, 2007, member of the International Biochar Initiative

Where will all the biomass come from?

Biochar lobbyists like to speak of 'agricultural and forest residues'.

Some also speak of 'degraded and marginal land'.

Scientific studies show that, to meet ambitious 'climate change mitigation targets', around **500 million hectares of plantations** will be needed (1 ½ times the size of India).

Forest 'residues'?

Removal of dead wood and 'residues' for bioenergy in Germany
Photo: Peter Wohlleben

Industrial removal of dead wood and other forest 'residues' causes

- serious damage to soils through compaction and removal of nutrients: This may be irreversible
- higher risk of drought and flooding, as the soil absorbs less water
- insects, fungi, birds and other species facing extinction.

The myth of “marginal and degraded lands”

West Kalimantan, Indonesia: A man sits on land that was once his rubber garden – classed as 'degraded' and 'unproductive and bulldozed to make way for an oil palm plantation.

Photo: Marianne Klute, Watch Indonesia!

We strongly challenge the myth that there is plenty of free land, going spare in Africa.

Farmers, pastoralists and indigenous peoples use these so-called 'marginal' territories but their existence and rights are often not recognised by their own governments”

African Biodiversity Network

According to the FAO, marginal lands provide key subsistence function to the rural poor and are often farmed by women.

500 million hectares of biochar plantations?

Shiselweni plantation, Swaziland

Burnt Western Shores Plantation, South Africa

Burnt tree plantation,
St Lucia

Photos: Wally Menne

A new threat to the climate ?

Nobody knows for sure whether industrial biochar will sequester any carbon for even a decade.

On a small scale, charcoal could well play a role in sustainable, climate friendly and biodiverse farming by small farmers – as one of many different ways of protecting and restoring soils.

But we have a good idea what hundreds of millions of hectares of biochar plantations will do to the climate.

Industrial monocultures accelerate climate change

are not

www.timberwatch.org.za/

Monocultures are the main driver of deforestation.

Monocultures of trees or crops deplete soil and water. They require large amounts of agro-chemicals made from fossil fuels.

Nitrous oxide and methane from industrial agriculture accounts for 14% of all greenhouse gas emissions.

Deforestation accounts for 18% - and peat drainage possibly for even more.

Monocultures drive Amazon deforestation

The Amazon holds up to 120 billion tonnes of carbon and plays a key role in regulating the rainfall cycle. Massive new demand for land, bioenergy and biochar is very likely to speed up its destruction.

Industrial tree plantations in Indonesia: Peatland destruction and deforestation

Cleacutting on an acacia plantation in Indonesia

Photo: Trivani Noor, Cappa

Peat fires to clear land for plantations

Photo: Nordin, Save our Borneo

There have been studies for prospective CDM funding for biochar for Indonesian acacia plantations. After palm oil, such tree plantations are the main driver of peatland destruction and deforestation.

"We are well positioned to win the current land-grab in next-generation fuels"

Best Energies, a leading company involved in pyrolysis and the development and patenting of biochar.- represented on the International Biochar Initiative Science Advisory Committee

The push for biochar: Keeping the public in the dark

There is virtually NO public awareness of the current push for biochar.

Optimistic statements made to UN bodies and to policy makers are NOT backed up by science.

Members of the International Biochar Initiative are lobbying UNFCCC, other UN bodies, the EU and other governments in the absence of any public debate – calling for CDM funding and other support.

Conclusions

Terra preta is one of many examples of small farmers developing locally adapted and highly successful and sustainable ways of protecting their soil and biodiversity.

The patenting of biochar, the push for CDM funding and the link with the development of large biorefineries suggests that industrial biochar development is something altogether different!

On the scale envisaged by those who believe biochar can draw down significant amounts of carbon dioxide from the atmosphere this is a programme, we are looking at planetary geo-engineering with unknown but potentially disastrous consequences for climate, people and biodiversity.