Biochar Land Grabbing: the impacts on Africa

A briefing by

The African Biodiversity Network, Biofuelwatch and the Gaia Foundation

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Tree plantation in South Africa. Photo: Wally Menne, Timberwatch

SUMMARY

A NEW TECHNOLOGY CALLED "BIOCHAR" is being promoted as a major "geo-engineering" solution to global climate change, as well as a means of improving soils and addressing poverty. But this technology raises serious scientific and social concerns. Many questions need to be answered before claims about biochar can stand up to scrutiny.

Africa is a particular target for biochar, largely due to the commonly held perception that there is abundant land available waiting for development.

In an atmosphere of climate urgency, biochar advocates hope that their product will be fast-tracked into the carbon market and gain accreditation through international climate negotiations. Biochar certainly has a huge potential for profit-making for private companies.

But the negative impacts of large-scale biochar development in Africa are likely to be dramatic, including exacerbating land-grabbing in Africa. Some biochar advocates admit that up to 1 billion hectares of plantations, largely in Africa, will be needed to grow the trees necessary for biochar production on a scale large enough to impact climate.

Africa is already experiencing massive land grabbing. Indigenous communities, forests, water resources and food production are already impacted by large-scale land grabs for agrofuels (biofuels) production and foreign agricultural investment. This has exacerbated evictions, food insecurity and land conflicts at a time when the continent is already suffering from the impacts of climate change.

The positioning of Biochar as climate change solution is dangerously premature. Claims about the potential for long-term carbon sequestration, soil fertility improvements and other stated benefits do not stand up to scrutiny – the tests have simply not been done. In fact, there is potential for biochar to *worsen* climate change, and pose health risks to rural Africans.

This briefing aims to highlight the impact that biochar developments will have on Africa's land, forests, agriculture and communities. It outlines the advanced state of biochar "field trials" in Africa, and highlights the flawed assumptions, unanswered questions and serious risks that biochar production may pose.

Biochar is clearly in no position to gain UNFCCC accreditation as a solution to climate change. Many questions must be asked and answered before it can be considered as a serious and viable answer to our planet's pressing problems.

WHAT IS BIOCHAR?

Biochar is fine-grained charcoal, which is applied to soils. Most commonly, the charcoal is produced through a process called pyrolysis, whereby biomass is exposed to high temperatures in the absence of oxygen. This produces two types of fuels in addition to the charcoal, (syngas and bio-oil), which can be used for heat and power, or further refined into agrofuels for cars or, potentially, for aviation. Pyrolysis can be done on a small-scale, for example in charcoal-making biomass stoves, or on a medium or large scale in pyrolysis plants.

Wood generally contains about 50% carbon, and other biomass contains less. In theory, pyrolysis can retain up to 50% of the carbon in biomass in charcoal. However, according to the International Energy Authority, in practice only between 12 and 35% of biomass is successfully retained[1].

Some advocates say that we can "cool the planet" by turning billions of tonnes of biomass from trees and crop residues into biochar. By burying the biochar, it is claimed that millions of tonnes of carbon can be sequestered in the soil, reducing the CO2 levels in the Earth's atmosphere.

HOW MUCH LAND?

Given the enormous quantity of biomass that would be required, using biochar to address climate change would have serious implications for land use.

Very few biochar advocates discuss how much land their proposals would require.

The economist Peter Read, is one of the most high-profile biochar advocates, and a member of the International Biochar Initiative. He advocates establishing up to 1 billion hectares of new tree plantations for biochar[1]. Considering that worldwide there are currently 1.5 billion hectares of total cropland, this would have serious implications.

Read expects sub-Saharan Africa to contribute 893 million hectares of this land. He believes that an area the size of France could be converted to plantations in the tropics and subtropics every year.

Read acknowledges that "the potentially available land is not unoccupied", but dismisses this concern because this is "land on which the occupants are not engaged in economic activity reported to the FAO." Apparently he sees this as justification enough to take over these lands.

These proposals have serious implications for the land rights and livelihoods of rural communities living in Africa. Communities living in areas targeted for biochar plantations may be evicted, ignored, or forced to produce biochar. As for biodiversity, Read suggests that species should just be conserved "in the reserves".

The United Nations Environment Programme (UNEP) recently published (though they did not necessarily endorse) a recent Climate Science Compendium. This publication suggested that "the most conservative estimate" for the potential of biochar is 20 billion tonnes of carbon sequestered in biochar, i.e. 1 billion tonnes a year[2].

Other biochar studies have suggested that 5.5-9.5 billion tonnes of biochar production every year could be achieved[3]. To achieve this, studies suggest that 500 million hectares for biochar plantations would be a very conservative figure[4], and it is likely to be much higher.

> ***"We are well positioned to win the current land grab in next-generation fuels and to develop the essential technologies for the biofuels and bioenergy products of the future."***
> ***BestEnergies, biofuel and biochar company and member of the International Biochar Initiative[5]***

[1] *Read, P.: Biosphere carbon stock management: addressing the threat of abrupt climate change in the next few decades: an editorial essay, Climatic Change, 87, 305–320, 2008.*
[2] *UNEP, Climate Change Science Compendium 2009. www.unep.org/compendium2009/PDF/compendium2009.pdf*
[3] *Lehmann, J et al, Biochar sequestration in terrestrial ecosystems, Mitigation and Adaptation Strategies for Global Change (2006) 11: 403–427*
[4] *Berndes, G., Hoogwijk, M. and van den Broeck, R.: 2003, 'The contribution of biomass in the future global energy supply: A review of 17 studies', Biomass and Bioenergy 25, 1–28.*
[5] *www.bestenergies.com/downloads/BEST_BioEnergyProducts.pdf*

LAND-GRABBING IN AFRICA

Eucalyptus and pine plantations next to a neglected and degraded wetland, South Africa. Photo: Wally Menne, Timberwatch

A large-scale biochar programme would greatly increase land pressures in Africa by creating a huge new demand for biomass. This would worsen the current trend towards land grabbing.

As GRAIN has documented, the land grab trend in Africa and elsewhere is driven by two separate crises: The food crisis (partly caused by push for agrofuels) and the financial crisis. As many countries with expanding and more affluent populations are unable to expand production within their borders, they seek agricultural lands outside of borders. Meanwhile, demand for agrofuels is creating huge new pressures for land as well. Under these circumstances, land is increasingly viewed as a particularly safe and lucrative investment for private companies. According to one report, foreign investors sought or secured between 15 and 19 million hectares of farmland between 2006 and mid-2009.[6] A large number of foreign land take-over deals are in Africa, with some of the largest deals having been concluded in Mali and Ethiopia and proposed in Madagascar.[7]

With a lack of secure land tenure rights, these land grabs are resulting in displacement of small farmers, indigenous peoples and other communities and the destruction of natural ecosystems.

A 2007 report by the African Biodiversity Network about agrofuels in Africa, concluded that "In the short term, farmers are already pushed off their land, prime land and forests are being cleared for the mass production of agrofuels for export and there is no doubt that the impact will be devastating to African communities but also to Africa's own energy security in the long term."[8]

Agrofuels have been shown to worsen climate change compared to the fossil fuels which they replace because they result in agricultural expansion and thus, directly and indirectly, in large-scale conversion of tropical and semi-tropical forests, peatlands and wetlands and grasslands, and because of the increased use of agro-chemicals including nitrogen fertilisers.

With many parallels between agrofuels and biochar, similar social and environmental consequences can be expected.

African governments need to learn their lessons, exercise caution and assess the likely impacts of biochar before they agree to signing away their land and resources.

CROP RESIDUES FOR BIOCHAR?

Some advocates claim that crop "residues" will be used for biochar. This has been a persuasive argument for implying that biochar production will not require additional lands.

However Johannes Lehmann (chair of the International Biochar Initiative) suggests that at the very most only 160 million tonnes of carbon sequestered through biochar could come from residues[9], which is a fraction of the widely advocated biochar 'potential'. Lehmann also suggests that 210 million tonnes of biochar could be produced by replacing all "slash and burn" farming with "slash and char", i.e. clearing vegetation from natural

[6] *http://farmlandgrab.org/8122*
[7] *www.iied.org/pubs/pdfs/17069IIED.pdf*
[8] *African Biodiversity Network, Agrofuels in Africa: The impacts on land, food and forests, 2007, www.gaiafoundation.org/documents/AgrofuelAfrica_Jul2007.pdf*
[9] *Lehmann, J et al, Biochar sequestration in terrestrial ecosystems, Mitigation and Adaptation Strategies for Global Change (2006) 11: 403–427*

forests and then charring it. Lehmann bases this on the assumption that 50% of the initial biomass carbon is retained in biochar, (the theoretical maximum, see p2), and that over 40% of the initial biomass carbon remains sequestered in biochar after 100 years.

The biochar advocates speak of "residues" without clarifying where these would come from.

African rural communities know the importance of crop residues to soil structure and fertility. Excessive removal of crop residues is linked to high rates of soil erosion and depletion, and makes farmers more vulnerable to drought. Similarly, excessive 'forest residue' removal depletes forest soils and undermines the health of forests. Furthermore, residues are also used as an important source of animal feed.

> ***"The impacts of large-scale biochar production on biodiversity and long-term agricultural sustainability (e.g. nutrient depletion) are unknown."[10] United Nations Environment Programme (UNEP) report***

BIOCHAR CLAIMS: PROVEN OR UNPROVEN?

The International Biochar Initiative, the main biochar lobby group, lists the following 'benefits' of biochar:

Climate benefits through carbon sequestration, carbon and other greenhouse gas reductions, co-production of bioenergy, improved water quality through reduced nutrient leaching, improved plant yields, enhanced soil water retention, reduced demand for chemical fertiliser inputs, waste reduction and utilisation, reduced soil erosion and degradation, agricultural intensification and the potential for distributed on- farm use.[11]

Felled tree plantations, South Africa.
Photo: Wally Menne, Timberwatch

A more detailed discussion about the science regarding those claims can be found elsewhere.[12] Here is a brief summary of concerns regarding these claims:

<u>Scientific basis:</u>
There are two sources of knowledge about biochar: The study of ancient charcoal-rich, fertile soils found in Central Amazonia (*terra preta*); and more recent studies involving modern biochar.

Terra preta soils were formed by indigenous farmers 500-2500 years ago. According to the Food and Agriculture Organisation: "the Terra Preta Soil Management as practiced in the Amazon Basin builds on a diverse and complex integration of organic soil amendments to maximize revenues and food quality, whilst minimising resource degradation."[13] Charcoal additions were part of those practices, but so were additions of very diverse biomass residues. It may have taken 50-100 years of those practices for the soil properties of terra preta to manifest.[14]

Biochar proposals, on the other hand, focus on charcoal additions, in many cases at the expense of organic residues and claims suggest that benefits are 'instant', rather than accumulating over decades or centuries.

Biochar studies are largely confined to laboratory and greenhouse studies, many of which involve sterile soils. There are a small number of published field trials, few of them comprehensive and all short-term (2-5 years). Studies show great variation in short-term results, which depend on the different soil types, the type of biomass which was used, burn temperatures, and crops grown with biochar.

A spokesperson for the Australian science institute CSIRO, which received substantial government funding for biochar research, stated serious reservations about advising farmers on biochar use, in the absence of further research, and expressed concerns about farmers already experimenting with biochar.[15]

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[10] *UNEP, "The Natural Fix? The role of ecosystems in climate mitigation, June 2009*
[11] *www.biochar-international.org/policy*
[12] *A. Ernsting and R. Smolker, Biochar for Climate Change Mitigation: Fact or Fiction, 2009, www.biofuelwatch.org.uk/docs/biocharbriefing.pdf, Chapter 5 Agriculture and Climate Change, Real Problems and False Solutions", preliminary report September 2009, www.econexus.info*
[13] *www.fao.org/nr/giahs/other-systems/other/america/terra-preta/en/*
[14] *www.css.cornell.edu/faculty/lehmann/publ/Media/Scientific%20American%20May%2015%202007.pdf (Bruno Glaser: "You would need 50 or 100 years to get a similar combination between the stable charcoal and the ingredients,"*
[15] *www.abc.net.au/science/articles/2009/03/04/2507238.htm*

BIOCHAR LAND GRABBING: THE IMPACTS ON AFRICA

The long-term impacts of biochar addition to soils are unknown. There is no reason to assume that they will mimic terra preta, a very different process.
In spite of a great deal of uncertainty, aggressive promotion and implementation of biochar is already taking place.

Following is a summary of concerns regarding the claims made by the International Biochar Initiative.

Climate impacts:
It is possible that biochar can actually exacerbate climate change, instead of reducing it. If small charcoal dust particles become airborne, either when biochar is applied to soil, or later through soil erosion, they can cause significant regional and global warming. The carbon contained in charcoal is black carbon and airborne black carbon is one of the main causes of global warming. Furthermore, biochar additions darken soils, causing them to absorb more heat, which can amplify the effects of droughts and heat waves.

The ability of biochar to sequester carbon in the long-term is highly questionable. Some charcoal, in some circumstances, is known to remain stable in soils for thousands of years. On the other hand, under some circumstances, charcoal quickly turns into carbon dioxide. Several studies[16] suggest that carbon in charcoal can disappear from soils at a much greater rate than predicted There is evidence that charcoal additions can stimulate the oxidation of pre-existing soil organic carbon into carbon dioxide.[17] .

Similarly to agrofuels, biochar production is being promoted, and implemented as a global climate change strategy, before the impacts are fully understood. It was only after widespread destruction from agrofuels, that scientists analysed the data and concluded that agrofuel production made climate change worse. There is a similar risk that biochar production will already be well established before it is properly analysed, and basic premises found to be flawed.

Co-production of bioenergy:
"It is claimed that rural communities can use the process of biochar production to co-produce energy for cooking. Little independent evidence is available about the efficiency of charcoal-making stoves although one trial showed considerably lower efficiency in a charcoal-making stove compared to a modern biomass stove which uses biomass for heat only - not surprising given that carbon retained as biochar is carbon not used to provide energy for cooking.[18] However, there are different types of charcoal-making stoves and manufacturers claim that very high levels of efficiency can be reached - independent research, however, is lacking.

Impacts on water quality:
According to CSIRO, although there are theoretical reasons why biochar might reduce nutrient leaching from soils, there has been very little research to see whether this is actually the case. The International Biochar Initiative claims that biochar will reduce water pollution by retaining more agro-chemicals in the soil. However, it has also been shown that toxins adhere to charcoal, which could result in uptake by crops, and therefore more toxins in food. This potential was recognized by the CSIRO .

Impacts on soil water retention:
It is claimed that biochar enhances soil retention of water. However, results are mixed and poorly understood.[19]
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Impacts on plant yields and links to synthetic fertiliser use:
Biochar is not a fertiliser and its impact on plant yields varies greatly. Fresh biochar contains ash and nutrients, which become exhausted after a short period. As a result, plant yields often improve at first (as with slash-and-burn agriculture) and then drop off.[20] Studies suggest that in some, though not all, cases, large quantities of biochar can make organic or synthetic fertilisers more effective, in the short term. As biochar is not a fertiliser by itself, if most residues are turned into biochar instead of compost, this will lock farmers into dependence on additional expensive and ecosystem damaging synthetic fertilisers that contribute to climate change.

Impacts on soil erosion and depletion:
Using crop residues for biochar rather than as compost, significantly speeds up soil erosion and soil depletion.

16 See C.A. Masiello (2004): New directions in black carbon organic chemistry, Marine Chemistry 92 and Hammer U., Marschner B., Brodowski S. & Ameung, W. (2004): Interactive priming of black carbon and glucose mineralisation .Organic Geochemistry 35: 823-830.
17 David Wardle et al ,2008. Fire-derived charcoal causes loss of forest humus. Science 320, 629.
18 S.C. Bhattacharya et al, A Study on Improved Institutional Biomass Stoves, www.retsasia.ait.ac.th/Publications/A%20STUDY%20ON%20IMPROVED%20INSTITUTIONAL%20BIOMASS%20STOVES.pdf.
19 Sohi, S et al, CSIRO, Biochar, climate change and soil: A review to guide further research, 2009
20 See for example Steiner et al. (2007): Long term effects of manure, charcoal and mineral fertilization on crop production and fertility on a highly weathered Central Amazonian upland soil. Plant and Soil 291:275–290

HOW SAFE IS BIOCHAR?

> *"Since charcoal is a documented cause of pneumococoniosis, an often life-threatening lung disease, such erosion [of soils containing biochar] may result in dramatic health effects if charcoal ends up in house dust or in aerosols."[21] Soil scientist Philippe Baveye*

In a recent Canadian trial, 30% of biochar was shown to blow away during application.[22] Farmers and people living close to areas where biochar is applied could thus be at risk of serious respiratory illness.

Air pollution can be a concern during pyrolysis, particularly if biomass has been chemically treated, contains other toxins or is mixed with municipal solid waste, old tyres, and other waste products, as the largest commercial biochar producer is now doing in the U.S. Even ash from forests in Europe has been shown to have extremely high concentrations of heavy metals. Charcoal retains and concentrates pollutants which could then enter soils, waterways and the food chain.

Some biochar projects, for example in Egypt, Ghana and Senegal, involve charring rice husks. Dust from rice husk ash is associated with silicosis[23], an irreversible and progressive lung disease which causes emphysema and lung fibrosis and often causes death.[24]

THE MYTH OF SMALL-SCALE 'SUSTAINABLE' BIOCHAR

Many biochar companies claim that, even if large-scale biochar plantations may be problematic, small-scale use by farmers would be 'sustainable'.

However, all the concerns discussed above regarding climate impacts, impacts on soils, plants and the health of communities exposed to biochar dust, also apply to small-scale use.

At the moment, all biochar projects are small scale because, in the (virtual) absence of subsidies, biochar use is not commercially viable. Larger-scale deployment is the explicit aim of several projects, for example one by the Centre for Rural Innovations in Cote d'Ivoire.

Emphasis on "small scale" biochar appears, at least in some cases, to be part of a marketing strategy to make biochar more politically acceptable. Biochar marketing company Genesis Industries openly speaks about their strategies for 'guerrilla marketing' and defines a focus on small farmers as a key marketing slogan for helping owners of pyrolysis machines market their products.[25]

Again, the marketing of "small scale biochar" has parallels with the case of agrofuels. Agrofuel proponents frequently point to African small farmers growing fences with *jatropha curcas*, to demonstrate that biodiesel production can be effectively integrated with small-scale food production. But, this small-scale, integrated model of production is then cynically used to justify an altogether different model of agrofuel production, one that may see those very same farmers evicted from their land to make way for large scale monoculture *jatropha* plantations.

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[21] *Baveye, P, Soils and runaway global warming: Terra incognita, Journal of Soil and Water Conservation, Nov/Dec 2007*
[22] *Husk B. (2009): Preliminary Evaluation of Biochar in a Commercial Farming Operation in Canada. Study by BlueLeaf Inc. http://www.blue-leaf.ca/main-en/report_a3.php*
[23] *Liu, S , Silicosis caused by rice husk ashes, J Occup Health, 1996, Vol 38*
[24] *www.who.int/mediacentre/factsheets/fs238/en/*
[25] *Genesis Industries: Marketing Your CO2 Neg products.www.egenindustries.com/Marketing_your_CO2_Negitive_Products.php ,accessed 9.10.2009*

BIOCHAR PROJECTS IN AFRICA

List of biochar projects (This is a list of all the biochar projects in Africa which we know of, including very small-scale ones.)

COUNTRY	REGION	COMPANY/ORGANISATION	DETAILS
Burkina Faso	near Tiebele	Centre for Rural Innovations (France)	Jatropha, moringa and planned biochar trials, linked toCote d'Ivoire project
Cameroon	SW Province Near Kumba	Biochar Fund (Belgium), Key Farmers Cameroon, IBI project[26]	'Field trials' involving 1,500 farmers
Cote d'Ivoire	Niambrun, Office in Grand Bassam	Centre for Rural Innovations/BeTheDevelopment (France)	Jatropha, moringa and biochar trials on 2,500 hectares, with the aim of involving other farmers as "the first promotion activities"[27]
DR Congo	Pimu region, Equateur Province	Biochar Fund (Belgium), ADAPEL, DR Congo	10-year project in ten villages
Egypt	Dakahliya Region	Universities of Copenhagen and Mansura, IBI project	Rice-husk pyrolysis
Gambia	Western Region, Bwiam	Individual 'technical Advisor (B. Jatta)	Small Jatropha, vetivier grass and biochar projects (jatropha work supported by Concern Universal)
Ghana	Northern Ghana	Abokobi Society Switzerland	Initial tests done with biochar from cocoa-shells and elephant grass, field trials being carried out
Ghana	West-central Ghana, near Wenchi	Rothamsted Research (UK)and Soil Research Institute in Kumasi, Ghana[28]	Study aiming to develop "biochar-based soil management strategies for smallholder agriculture"
Kenya	Western Kenya, Nandi district	Cornell University (US), IBI project (chaired by J. Lehmann, chair of the IBI)	Ongoing research projects since 2005; Project involving charcoal-making stoves, aiming to involve 1,000 households.
Kenya	Western Kenya, Suba district, Sindo	Peter Ongele, research assistant, who supports the IBI	3-year biochar trial, currently involving around 100 farmers.
Kenya	n.k.	Shalin (Finland) and Helsinki University of Technology	Biochar-making Anila stoves, development of a strategy to incorporate those into projects with farmers.
Mali	n.k.	Pro-Natura (France), funded by Altran Foundation	Pilot pyrolysis plant and planned or commenced 'green charcoal' project.
Niger	Niamey	n.k. (Pro-Natura?)	Small trial
Senegal	Saint-Louis Region, Ross Bethio	Pro-Natura, sponsored by Societe Generale	Biochar trial involving financial incentives and 'training' for farmers
South Africa	Mpumalanga Province	Alterna Energy Z.A. (subsidiary of Canadian company)	Small pyrolysis plant, charcoal sold as fuel or used for biochar trials, company promotes biochar
South Africa	Southern Cape, George	Andre Taljaard (background not known)	Has carried out greenhouse tests and plans to involved farmers in larger field trials.
South Africa	n.k.	SANERI, University of Western Cape, Stellenbosch University	Feasibility study about pyrolosis completed, SANERI speaks favourably of biochar.
South Africa	n.k.	Delta Mining	Company looking for biochar projects
Zambia	Eastern Zambia	Cornell University, WCS, COMACO	Scientific trials since 2006, involving around 300 farmers

[26] *The International Biochar Initiative has selected 'Nine Country Projects', partly to "evaluate cost effective approaches for the widespread introduction of biochar", www.biochar-international.org/sites/default/files/December2008newsletter.pdf (The details cannot currently be accessed on the IBI website but the authors have a copy.)*
[27] http://planetaction.wsinteractive.net/web/6-projects.php?projectID=1390
[28] *Biochar has been supplied by Embrapa and the project has received a financial award from the Royal Society.*

Other companies involved with biochar in Africa

+ *Biochar Trust:* An online platform to raise finance for 'small-scale' biochar projects, set up by the French initiative Terracarbona, provides funding for Pro-Natura's biochar activities in Senegal and has close links with Shalin.

+ *Carbon Gold:* UK company actively involved in lobbying for biochar carbon credits, current projects in Belize, Maldives and the UK, has discussed plans in Ghana and Mozambique.

+ *WorldStove*: Italian company which sells biochar-making stoves, working closely with the IBI. They have conducted pilot projects in Kenya, Malawi, Uganda and Zaire and outside Africa and have ongoing projects in Burkina Faso, Congo, Niger and Uganda.

MAJOR ACTORS IN THE PUSH FOR BIOCHAR

The International Biochar Initiative (IBI) is the main international lobby group for carbon credits and other support for biochar, and aims to roll out large-scale biochar deployment. Members of the IBI include biochar/pyrolysis companies, soil scientists (some of them with known company links), a representative of the Brazilian Agricultural Research Institute, EMBRAPA, and two NGOs.

A large number of biochar startup companies have been founded in recent years, primarily in the US, Canada, Germany, the UK, New Zealand and Australia. It is likely that all of these depend on future carbon credits or other subsidies for their future.

SCIENTISTS OR LOBBYISTS?

Scientific research into the properties of charcoal in soil is urgently needed. However, it can be argued that there is a conflict of interest between some scientists' academic work, and their active involvement in lobbying for carbon credits for biochar.

Rather than producing academic studies to analyse the impacts of biochar, many so-called "field trials" are already being used as first steps towards the wider use of biochar. For example, some "field trials" are run by enterprises (such as Biochar Fund), without results being submitted for peer-reviewed studies. Some scientific studies look at facilitating commercial deployment rather than studying the impacts of charcoal on soils and the climate. Other trials have openly stated their goal to demonstrate the benefits of biochar.

A substantial gap in the evidence base must be addressed before biochar can be proven to be the miracle technology its promoters claim.

BIOCHAR LOBBYING IN AFRICA

The UN Convention to Combat Desertification (UNCCD) Secretariat has been closely working with the IBI and strongly promotes carbon credits for biochar.

In September 2008, an Africa Carbon Forum conference was held in Senegal at which Christoph Steiner and Godspeed Kopolo, on behalf of the UNCCD, gave a presentation supporting biochar carbon credits. The Africa Carbon Forum's aim is to increase Clean Development Mechanism (CDM) credits in Africa

Earlier in 2009, the government of Swaziland made a submission to UNFCCC for inclusion of biochar into carbon trading and REDD-plus, which was also signed by the governments of Gambia, Ghana, Lesotho, Mozambique, Niger, Senegal, Tanzania, Uganda, Zambia and Zimbabwe.

CARBON CREDITS: VOLUNTARY MARKETS, UNFCCC, CDM, REDD-PLUS AND "SOIL CARBON SEQUESTRATION"

Carbon credits offer a number of possibilities for profitability of biochar schemes, in both the UNFCCC and the voluntary carbon markets.

BIOCHAR LAND GRABBING: THE IMPACTS ON AFRICA

UK biochar company Carbon Gold has submitted the first draft methodology for biochar to the Voluntary Carbon Standards Agency. If this is approved, it would most likely lead to voluntary carbon offset funding for biochar projects.

Another funding stream of interest to biochar advocates is REDD-plus (Reducing Emissions from Deforestation and Degradation). The UNFCCC submission by eleven African governments specifically refers to potential links between REDD and biochar. The Congo Basin Forest Fund has granted funding to a project in DR Congo, led by Biochar Fund, based on unproven claims that biochar use would end "slash and burn." The grant is based on the idea that 'slash and char' will render the soil permanently fertile, something for which no evidence exists.

The main focus of lobbyists, however, has been Clean Development Mechanism (CDM) carbon credits. In early 2009, biochar was the only agricultural technology explicitly mentioned in the draft negotiating text for Copenhagen. As of October 2009, this reference has since been removed from the official negotiating text.

However there is still a significant possibility of "soil carbon sequestration" being included in a Copenhagen Agreement and into the CDM. If this happens, biochar advocates will undoubtedly endeavour to have biochar included in the CDM this way**.** If soil carbon sequestration gets into the Copenhagen Agreement and the CDM, the CDM Board can decide to make biochar eligible without governments having any further say.

"Soil carbon sequestration" must therefore not be approved for CDM accreditation before full SBSTTA discussions.

Tree plantation, South Africa. Photo: Wally Menne, Timberwatch

CONCLUSION

Large-scale biochar production will lead to an African land-grab that will make even the current agrofuel and agricultural investment land-grabs seem tiny in comparison.

There are strong indications that airborne carbon particles from biochar may exacerbate climate change, and threaten peoples' health, even if used at the small-scale.

Removing and charring large quantities of crop and forest residues can accelerate soil depletion and erosion and forest biodiversity. Biochar is not a fertiliser, and can, even in the short-term, only work in conjunction with them.

Biochar could replicate the unfolding disastrous experience with large-scale agrofuels, which has led to large-scale displacement of small farmers and indigenous peoples, displacement of food production, loss of food sovereignty, increased deforestation and ecosystem destruction and more climate change.

These developments are likely to unfold if biochar is included into carbon trading or REDD-plus, either explicitly, or "through the back door" via the inclusion of "soil carbon sequestration" in international climate negotiations.

Many socio-economic concerns and scientific questions about biochar therefore need to be addressed before this technology can realistically position itself as "cure" for climate change. Any official accreditation of biochar before these questions are answered would be dangerously premature.

ACRONYMS

- CDM – Clean Development Mechanism (a UNFCCC programme)
- CSIRO – Commonwealth Scientific Industrial and Research Organisation (Australia)
- IBI – The International Biochar Initiative
- REDD – Reducing Emissions from Deforestation and Degradation (a UNFCCC programme)
- SBSTTA – Subsidiary Body on Scientific, Technical and Technological Advice (scientific advisory body to UNFCCC)
- UNEP – United Nations Environment Programme
- UNCCD – United Nations Convention to Combat Desertification
- UNFCCC – United Nations Framework Convention on Climate Change

FOR FURTHER INFORMATION, CONTACT:

- Almuth Ernsting, Biofuelwatch, UK almuth@ernsting.wanadoo.co.uk +44(0) 1224 324 797

- Teresa Anderson, the Gaia Foundation, UK teresa@gaianet.org +44 (0) 20 7428 0055

- Anne Maina, the African Biodiversity Network, Kenya annenjiku@gmail.com, +254 67 20 229