

## Biofuelwatch response to WorldStove's critique of our (interim) report "Biochar: A critical review of science and policy"

There are three main points to WorldStove's critique of our report and previous publications:

Firstly, they question why we would 'attack', i.e. criticise WorldStove even though they state that their goals are to "empower small farmers, increase food sovereignty and decrease deforestation, thereby preserving ecosystems and mitigating climate change".

Secondly, they suggest that vast amounts of agricultural and forestry residues are available and could be used for biochar production.

And thirdly, WorldStove claims that their biochar-stoves concept "is unique in that it is the only wedge capable of actually reducing CO<sub>2</sub> in the atmosphere, rather than just limiting emissions" and that biochar-making stoves are particularly efficient and cleaner than similar types of stoves which gasify rather than retain char.

Biofuelwatch's interim report "Biochar: A Critical Review of Science and Policy" is available at:  
[www.biofuelwatch.org.uk/2011/a-critical-review-of-biochar-science-and-policy/](http://www.biofuelwatch.org.uk/2011/a-critical-review-of-biochar-science-and-policy/)

WorldStove's critique can be found at:  
[www.worldstove.com/wp-content/uploads/download/critical\\_review.pdf](http://www.worldstove.com/wp-content/uploads/download/critical_review.pdf)

### 1. Reasons for our criticism of WorldStove

**WorldStove are one of several biochar companies making claims which are not born out by science and facts.** This, in our view, is particularly serious in view of the fact that they claim to be working with rural communities in many countries of the global South. Small farmers in countries such as Burkina, Sierra Leone and Haiti, where WorldStove say they are involved in stoves projects, are particularly vulnerable to the current impacts of climate change (caused mainly by emissions in the global North). They need and deserve honest and factual information about options available to them, including options for stoves and farming practices. WorldStove's claims that biochar from their stoves is 'carbon negative' and will help plants grow better are not based on any published evidence. As we have shown in detail in our recent report, biochar field studies show that impacts on soil carbon as well as on crops and other plants are highly variable, unpredictable and by no means always positive. This is not surprising because the chemical structures and properties of different biochars vary greatly, depending on the original feedstock, the method and temperature of charring, how the char was cooled and the interaction of the same batch of biochar with different soil types and different crops grown is also highly variable.

Out of 11 different published field study 'samples', there were only three cases in which adding biochar to soils could be shown to sequester more carbon than common alternative farming practices – even for the short period of those trials. One trial in Colombia even found that one year after a substantial amount of biochar was added to some plots, those plots held less carbon than ones to which none had been added. Short-term impacts on crop yields were shown to be similarly unpredictable and in various cases negative. No field trial results involving biochar produced in WorldStove's stoves have ever been published.

We have been criticising similar unverifiable claims about climate and soil fertility 'benefits' made by a range of companies and other biochar advocates. However, in the case of WorldStove, we have particular questions and concerns.

In 2009, WorldStove's director Nathanael Mulcahy advised us in email exchanges of a CDM WorldStove project in Burkina Faso, involving stoves provided to help a women's shelter. When challenged, Mr Mulcahy changed this to a claim about a CDM project application rather than an approved CDM project, 'information' about which he sent out widely, including to the

UNFCCC Secretariat. We decided to investigate this further. Any CDM project application should be listed on the CDM website and, furthermore, as a first step, the Designated National Authority for the CDM would have had to be informed. No application that matched WorldStove's alleged project could be found on the CDM website. We then confirmed in a phone call with the Designated National Authority what project applications they were aware of. Again, there was none that could possibly have been what WorldStove's director had described. In short, claims about an alleged stoves project made in writing by the company contradicted information from the relevant official sources.

Then, shortly after the 2010 earthquake in Haiti, we read several media articles about a new biochar stoves project launched by WorldStove to help communities affected by that earthquake, in collaboration with the International Lifeline Fund a US-based charity with a long track record of supporting poor communities through both Clean Water and Sanitation initiatives and Fuel Efficient Stoves. At the time, the WorldStove project was indeed announced on that charity's website. Yet their website shows that they have more recently pursued an entirely different stoves project in Haiti and removed all references to a 'partnership' with WorldStove. No independent information about an alleged WorldStove Haiti project has ever been published.

Even more recently, in March 2011, we read WorldStove's announcement about 'measurable offsets' for biochar stoves: "*Since WorldStove has always pledged 100% of all carbon credits earned to the local stove hub, this added revenue helps communities invest in themselves and expand their own programs without additional outside aid.*" (<http://measurableoffsets.com/>). This is a remarkable claim: A recent investigation by the Institute for Agriculture and Trade Policy ([tinyurl.com/6x8pvqr](http://tinyurl.com/6x8pvqr)) looked at the World Bank's first ever soil carbon offset project, which is based in Western Kenya (not involving biochar). Those investigations showed that transaction costs for soil carbon projects are very high, resulting in significant revenues for consultants and brokers but leaving only very negligible sums going into the hands of participating small farmers. If, as claimed by WorldStove, 100% of carbon credits went to local community members ('stoves hub') this would require those people to have been fully trained in handling highly complex and expensive carbon offset transactions, which WorldStove has not suggested would happen. Perhaps even more importantly, the WorldStove's 'information' suggests that revenues are already being earned from biochar stove carbon offset projects. Yet, whilst they state that they have had their scheme certified for carbon offsets by an Italian organic farming certification company (BIOS), we have found no evidence of them having sold or being close to selling offsets and thus generating revenues for anybody. BIOS do not trade in carbon offsets.

***Hence, it seems to us that close scrutiny of the claims WorldStove is making about "their projects" is required – not to mention their general claims about the efficacy of biochar and stoves.***

## **2. Availability of residues suitable for biochar production**

WorldStove have criticised us for underestimating what in their view is very large-scale availability of agricultural and forestry residues "without reducing soil fertility or increasing danger of erosion". They cite from a range of different regional and global studies which provide high figures for the potential 'availability' of residues. Many of these studies refer to residues that could not realistically be used for stoves because of their geographical location, because of practical considerations such as transport, or because using them for that purpose would not be safe (for example where agro-chemicals have been applied).

A discussion of each of the sources cited by WorldStove would require a report of its own and go well beyond the scope of this response. However, as one example, WorldStove cites a study which strongly supports geo-engineering in the form of large-scale ocean sequestration of crop residues. This contains no original research into the availability of crop residues and the impacts of its removal but relies on figures published elsewhere for the total volume of such residues. It relies also on (largely US) studies about impacts of corn stover removal on soils which support the claim that 30% of corn stover can safely be removed from North American soils. From this it is extrapolated to claim that removing 30% of all crop residues

worldwide would be safe for soils ([tinyurl.com/6egf57s](http://tinyurl.com/6egf57s)). Another of WorldStove's sources is an article called "Evaluation of roll-off trailers in small-diameter applications" ([tinyurl.com/5th4o93](http://tinyurl.com/5th4o93)). That article indeed claims that large quantities of 'forest litter' could be removed from western US forests, without referring to the volume of scientific studies that show the very negative impacts of doing so, but those figures are not based on the author's research and they do not discuss impacts on forest soils. After all, the purpose of the article and the project was simply to look at how to efficiently transport forest litter from those forests.

What seems particularly striking is that a company like WorldStove which claims to support measures to combat deforestation, to protect small farmers and food sovereignty relies in their literature and in their justification for a large 'biochar potential' on global figures for residues and waste which largely depend either from food waste (and thus unsustainable over-consumption in the global North) or from the existence of large industrial monocultures generating 'residues'.

### **3. Properties of biochar-making stoves**

Biofuelwatch has long stressed the need for independent auditing and research to look at the range of biomass stoves available and assess and compare them for various properties, including efficiency and air quality impacts. These stoves should always be compared to one another, not to open "three stone" fires, as point of reference. Sadly, such a study is yet to be published.

The small number of stoves studies/reports which have been published largely rely on information provided by the companies that produce those stoves. As we discuss in our report, the UK Biochar Research Centre (UKBRC) has published a report about biochar-making stoves, partly based on results from women's discussions groups in India and Cambodia ([tinyurl.com/6afze4o](http://tinyurl.com/6afze4o)) and this does not back up WorldStove's claims about biochar-making stoves. This report confirms the need for further research to assess different types of stoves, lists various practical problems related to the use of biochar-making stoves and confirms: *"More biomass ends up being used [in stoves] where biochar is produced and this additional fuel collection costs time and removes more biomass."* We have found nothing in the UKBRC report or anywhere in the literature to back up WorldStove's claims that gasifying stoves that burn (or, technically, gasify) the char instead of retaining it release more air pollution. The literature we have seen (e.g. [tinyurl.com/4skshgj](http://tinyurl.com/4skshgj)) suggests that gasifying stoves, including both 'char-gasifier' stoves and biochar-making ones, both tend to be approximately equivalent in terms of air emissions. If WorldStove can provide independent studies which back up their claims, we will look carefully at those.