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Faced with a high-profile lawsuit in New York, oil giant Shell reached a settlement in June with the families of murdered Nigerian activists. Instantly, questions were raised. **Andy Rowell** explains all

BEAR WITH US...

» Apologies to those of you who may have experienced some technical difficulties using the new website. We're aware that some subscribers have had trouble logging onto the site (if this is you, please call us on 01371 851 879), and we have also heard that the drop-down menus at the top of the website don't always work properly for visitors using Internet Explorer. We're working as quickly as we possibly can to fix these issues. Do try again!

A new beginning



A very warm welcome to our first printable monthly newsletter. On the pages that follow, you'll find all the key stories from the website in June, as well as our favourite comment piece. If you've made the transition with us from the print to the online version – thank you. Your support is what enables us to continue, and we're sure that not only will you find the website as informative as the magazine, but that in time you'll become as comfortable using it as you were leafing through the print edition.

If you're a new subscriber, welcome also. You're joining us as we enter a new stage in the Ecologist's history, going where, at certain times in our past, we have feared to tread. What has become abundantly clear in the last few years is that environmentalists must no longer be afraid to tread anywhere. Just as in the past we might have balked at the thought of moving online, so many early disciples of the green movement harboured an innate fear of working with business, government and mass media. Today, we must be prepared to plumb all these depths, even if at times we feel uncomfortable. If we do not, our fate is clear: we lose relevance, we lose our voice, and into that vacuum creep the kind of business plans, policies and reporting that have pushed our planet towards its current state.

That state is aptly summarised by the three investigations that follow. In the first, Ecostorm investigative journalist Andrew Wasley uncovers shareholder data to reveal that mining company Vedanta Resources plc – which is preparing to bulldoze an Indian mountain sacred to local people – lists among its investors some of the UK's best known businesses and organisations, from Jaguar to the Church of England.

In the second, Eifion Rees takes a look at the UN's World Heritage Sites in Danger list, and asks key environmental campaigners what other areas should be added.

And in the third, campaigning journalist Almuth Ernsting digs deep into the infant science of biochar – the application of charcoaled agricultural wastes to soils in an attempt to remove carbon dioxide from the atmosphere.

What binds these gripping stories together is a simple, but crucial, environmental question: whose land is it anyway? Vedanta maintains that the Indian government has given it the go-ahead for its mine, and that it will bring development and health benefits. Local people say the land is biodiverse, sacred, and cannot be priced.

The land on which our heritage sits is often under threat because environmental impacts ('externalities', to the economists) have not been accounted for at source – meaning that destruction winds up on someone else's doorstep.

And the big question about biochar is not whether the technique works: science will tell us that. It is whether giving the technology an official green light will lead to the 'biofuel effect' – tracts of prime agricultural land converted to lucrative, fast-growing plantations in an attempt to bury as many of our carbon sins as possible.

*Mark Anslow, Editor
mark@theecologist.org*

Bankrolling destruction

Plans to bulldoze an Indian mountain were bad enough before the discovery that UK companies, from the Church of England to Jaguar, own shares in the company behind the mine. **Andrew Wasley** reports

They are among the UK's best known high street lenders and iconic companies. Few customers would be aware that they are now at the centre of a major showdown between activists and a mining corporation over allegations of environmental destruction and indigenous rights violations in a remote corner of India.

But an investigation by the *Ecologist* has revealed how leading banks, insurance providers, car manufacturers and brewery chains have pension funds or similar schemes invested in a company responsible for a controversial mine in Orissa which threatens, according to campaigners, to devastate a vital forest ecosystem and the homes of a unique tribal community.

Church organisations, charities and local authorities have also been revealed as being shareholders in Vedanta Resources, a UK-registered, FTSE-100 listed company. Many of the investments are managed by third party fund managers.

Vedanta subsidiary Sterlite Industries Ltd is poised to begin mining for bauxite - a raw form of aluminium - in the north western part of the Niyamgiri hills, in India's Orissa state. The scheme was given the go-ahead last month by the Indian Supreme Court after a protracted legal battle.

Government reports and research compiled

by campaign groups has warned that the mining operation, which will see the extraction of millions of tons of bauxite from some 600 hectares of forest, will result in ecological degradation that could threaten the livelihoods of tribal people who rely on the land for sustaining their traditional way of life.

A nearby bauxite refinery, already constructed by another Vedanta subsidiary, Vedanta Alumina Ltd, to process bauxite from the proposed mine, has been blamed by local people for causing health problems, damaging crops and killing livestock.

The refinery currently handles bauxite brought in from other regions and is expected to be expanded.

Campaigners claim several villages were razed to make way for construction of the Lanjigarh refinery, with up to 100 indigenous families evicted from their land and relocated to 'rehabilitation colonies' where locals claim they feel as though they are living 'in a jail' with little access to land for farming.

Vedanta disputes activists' allegations, maintaining that the company is committed to conducting its operations in and around Lanjigarh in a sensitive and responsible manner, and claiming that the mine will bring much needed economic development to the area.

Household names

Although the majority shareholder in Vedanta is its billionaire owner Anil Agarwal, documents seen by the *Ecologist* reveal that a host of UK banks, companies and other bodies are also shareholders in the company.

Halifax Pension Fund, Lloyds TSB Group Pension Fund, Norwich Union Life and Pensions Ltd and Prudential Managed Pension Fund, amongst others, are all named as beneficial shareholders in the controversial mining conglomerate.

Also listed as shareholders are Axa Sun Life Assurance Society, Jaguar Cars Pension Plan, Land Rover Pension Trustees Ltd, Unilever Pension Fund and Coors Brewers Pension Fund.

A number of local and regional authorities - including Suffolk County Council, Havering Borough Council and Hertfordshire County Council - appear in the register by virtue of their pension funds.

The Church of England and the Joseph Rowntree Charitable Trust have also indirectly bought shares in Vedanta.

Whilst there is no suggestion that any of the shareholdings are directly bankrolling Vedanta's planned bauxite mine, shareholders could find their links to the company prove embarrassing as campaigners vow to step up efforts to highlight the mine's environmental and social impact.

Two former major shareholders in Vedanta Resources - the Norwegian Government Pension Fund and Edinburgh-based investment broker Martin Currie - withdrew their holdings last year because of ethical concerns.

Pressure is now expected to be brought on current investors ahead of next month's AGM in London where Vedanta directors will face questions over the company's operations in Orissa. Activists want shareholders to demand that Vedanta suspends its plans for the mine - and if they refuse, sell their shares.

Meredith Alexander from ActionAid UK told the *Ecologist*: 'The growing international scrutiny of Vedanta's activities in Lanjigarh and elsewhere led the Norway Pension Fund to withdraw its investment of \$15.6m from the company. Other investors need to consider if it really is in Vedanta's best interests to go ahead with the mine.'

Survival International accused investors in



Women walk past the Vedanta refinery in Lanjigarh, Orissa. People living nearby complain of suffering from breathlessness, noise pollution and skin diseases

Photo: Sanjit Das/ActionAid



Tribal women gather to protest and listen to speeches at Bijepur at a rally organised by the indigenous rights group, Adim Adhikar Surakshya Manch Photo: Stuart Freedman/ActionAid

Vedanta of effectively 'bankrolling' the destruction of indigenous land in the Niyamgiri Hills, and said shareholders had the power to persuade the company to halt the development.

Contested ground

The Niyamgiri Hills are the ancestral home of three distinct 'Khonda' indigenous communities – Dongaria, Kutia and Jharania – who view the land as sacred and rely on it to sustain their traditionally self-sufficient existence. The fertile region is heavily forested and the source of more than 30 springs and two rivers – a vital resource for both local people and myriad wildlife. With as many as 300 species of rare plants, the area is also home to an array of animals including, say campaigners, tigers, leopards, monkeys, deer and elephants. Ecologists have described the Niyamgiri Hills as being of 'great conservation significance', and the area has been proposed as both a wildlife sanctuary and elephant reserve.

The impact of mining in the region is not to be underestimated. A 2005 report by the Indian Supreme Court's Central Empowered Committee (CEC) said: 'By mining of bauxite deposits at the top of Niyamgiri the water retention capacity of the bauxite deposit will be destroyed. The mining will lead to the flow of mineral overburden into the streams. In the process it will destroy the unique micro-niches along the streams.'

'Any mining in the areas is bound to destroy the biodiversity and affect the availability of water for the local people,' the report concluded.

Local people blame the existing Lanjigarh refinery, which generates caustic soda waste,

for contaminating groundwater and destroying crops, and making both livestock and people ill.

'During the rains, you can see the full force of the caustic waste water coming from the pipe. The pipe comes out of the factory straight into the river. It is like when you mix cement into water – slurry,' said Balabhadra Hial (an alias), who lives in a village less than a mile away from the Lanjigarh refinery.

'Three, four bullocks have died; the cows have died in my village. We have had cattle for ages, we know the kind of diseases they suffer from [and this is different]. We have stopped drinking that water, since the cattle started dying. I haven't even bathed in it so I haven't had that, but I have seen other people having kind of blisters and kind of boils.'

Another local said: 'When we bathe the skin itches. When we drink water we get sores in our mouth. It is difficult to breathe. Hair begins to fall.'

A study by the Orissa Pollution Control Board in 2008 found that caustic soda seepage from the site was 'alarming'. The report also claimed that waste from the refinery had been discharged into the River Vanshadhara.

'I didn't know what I was signing...'

Those forced out of their homes to make way for the refinery claim facilities in the 'rehabilitation colony' to which they have been relocated are unsatisfactory. They say there is little access to land for farming, and that the process wasn't properly explained.

Suna Majhi (not his real name) who used to live on the site that is now the refinery, says that he didn't understand what was going on

when he signed paperwork agreeing to the relocation.

'I never wanted to give up my land and my house, but someday they asked me to sign on something and I didn't know what it was and I just signed. They said nothing when they asked us for our signatures, I didn't know that such a big factory would be built here. I knew there would be a factory, but the government was vacating us so we didn't protest, we didn't know how to protest,' he said.

The CEC report noted that, 'the rehabilitation package for the displaced persons given by the user agency is not in the interest of sustainable livelihood of the local communities as no land has been given for grazing purposes, raising agricultural crops and carrying out other income generating activities, etc. The location of the rehabilitation colony has been decided totally ignoring the interest of the conservation of forests... the team saw stumps of freshly cut sal trees in the Niyamgiri forests.'

Relocated families say they feel intimidated in the rehabilitation colonies, and claim that they have been watched by 'company people' and warned not to interact with outsiders. Suna Majhi told researchers that 'the whole thing is fenced, it is like a jail - I can't see long distances and things. There is only one entrance to the colony [and] we can't move freely around.'

During the relocations themselves, local people reported an atmosphere of fear and allegations of police brutality.

Whilst there is no suggestion that those involved in these incidents were acting on the instruction, or with the approval or knowledge of Vedanta, the CIC report concluded that 'allegations about the improper rehabilitation and the forceful eviction need to be looked into carefully through an impartial and unbiased agency'.

Anyone for growth?

When approached over the claims of intimidation and force, Vedanta responded – according to ActionAid – that the allegations were 'baseless', and stated that there had not been any forcible evacuations and that no complaints had been made to the local authorities.

In a detailed statement to the *Ecologist* Vedanta said it was 'committed to conducting all of its activities sensitively and responsibly. In common with many large companies with operations in India, we work in partnership with the local authorities and a number of NGOs that are based in India, to ensure that the communities that are based close to where we operate, benefit from and share the economic benefits generated from our activities.'

The company said it did 'not accept' the allegations made by campaigners in relation

to the environmental impacts of the project in and around Lanjigarh and its effects on the indigenous peoples that live in the area.

'The planned bauxite mine was the subject of a detailed and intensive examination by the Supreme Court of India. This examination included its environmental impacts, an assessment of whether it had the support of the majority of the local community and the suggestions that have been made about it. Following this examination permission was granted for it to proceed,' the statement said.

Vedanta accused campaigners of ignoring the economic benefits that the mine will bring to the area, and said activists had turned down offers to discuss the matter.

The company said the recent decision to allow the mine to go ahead would enable it 'to address some of the critical problems that have affected the area for a very long time. These include very high levels of preventable diseases [notably malaria], little or no employment or training opportunities, a particular lack of opportunity for women, little or no educational or medical facilities and a lack of general economic infrastructure.'

The statement highlighted several Vedanta initiatives aimed at eradicating malaria in the region, and providing 30,000 schoolchildren with regular, nutritionally balanced food. Relocated villagers say that the company has helped with education and provided financial assistance.

Pressure builds

Campaigners remain defiant: 'The Kondh tribal people believe that allowing the mine to go forward will destroy their way of life. No offer of compensation is sufficient to make up for what will be lost,' said Meredith Alexander of ActionAid UK.

Survival International's Jo Woodman said: 'Vedanta Resources has proved itself to be a company disdainful of tribal peoples' rights. It has not even informed the Dongria Kondh of the fate that awaits them and their sacred mountain, let alone consulted them meaningfully or sought their consent. The company has dismissed the Dongria's vociferous protests against the mine.'

Despite its legal victory enabling mining to begin, the company faces further challenges.

The presentation of a prestigious 'Golden Peacock' award to Vedanta for its environmental management was recently delayed after campaigners highlighted the pollution connected to the Lanjigarh refinery.

And the Organisation for Economic Co-operation and Development (OECD) – which investigates whether companies are breaking international guidelines for multinational enterprises – is expected shortly to publish the results of its own inquiry after receiving an complaint from Survival International claiming that Vedanta pushed ahead with the

mine's development without properly consulting communities.

Additionally, the *Ecologist* has learnt that several London law firms are currently considering privately-brought actions in the British courts to secure compensation for people affected by Vedanta's operations in Orissa.



The tribal resettlement village, Lanjigarh, built by Vedanta in return for the land needed for the refinery. The camp is now largely empty.

Photo: Stuart Freedman/ActionAid

A fair share?

Many of the shareholders contacted about investments in Vedanta declined to comment.

A spokesman for Insight Investments, which manages some investments for the Halifax Pension Fund, confirmed they do hold shares in Vedanta on behalf of retail investors, but said this was 'just a fraction of 1% in this business'. Halifax is now part of the Lloyds Banking Group following an enforced, Government-backed merger in 2008.

Don Hume, Director Corporate and Government Affairs for Jaguar Land Rover, said: 'Since both the Jaguar and Land Rover Pension Funds are administered by independent trusts, it is not our place to speak for them. However, I can tell you that, as is normal for pension funds, they both hold broad portfolios of investments in FTSE 100 companies, which fulfill their legal requirement as trusts to achieve the best possible return on investments.'

Suffolk County Council said: 'The County Council takes its responsibilities as a corporate shareholder seriously. The County Council's Pension Fund Committee will be advised on the situation in relation to Vedanta's activities in Orissa at its forthcoming meeting.'

A Havering Council spokesperson said: 'We ask that our investment managers consider a

company's social and ethical codes as part of their investment processes. However, the day to day management of our funds are the discretion of the investment manager. The pension fund's policy is set out in our statement of investment principles, which is available on our website.'

Ben Wilson, Church of England communications officer, told the *Ecologist*: 'Church of

England investing bodies do hold shares in Vedanta, which is not part of any of any investment category excluded on ethical grounds. The Church's Ethical Investment Advisory Group engages with companies on behalf of the Church's investing bodies where it has concerns or questions about aspects of companies' activities.

'Disinvestment is the last resort and we would rather use the Church's influence as an investor to get any shortcomings in corporate responsibility addressed. We do engage with a mining companies about the effects of their operations on local communities.'

The Joseph Rowntree Charitable Trust confirmed that it is a beneficial holder of shares in Vedanta Resources. The trust said that after it became aware of allegations – which 'threw up very serious questions about the company's approach to environmental issues, including biodiversity, and human rights' – it approached Vedanta over the claims, but that the company has failed to respond. The trust said it would be reviewing the situation in September.

To see details of all those companies with investments in Vedanta, see this article on the Ecologist website.

Andrew Wasley is a journalist with the investigative agency Ecostorm

Saving our heritage...

As the UN meets to decide on whether more of our heritage should be added to its Danger list, **Eifion Rees** asks how effectively we look after our history, and asks experts what other areas should be on the list

In the last week of June, in the sunny surrounds of Seville, a committee met to discuss two lists. To be added to the first will bring international recognition and tourist income: the World Heritage List celebrates sites – 878 at current count – deemed to have ‘outstanding universal value’. It is unlikely that any government would find anything outstanding about being included on the second.

Compiling the List of World Heritage in Danger is the lesser-known task of the UNESCO World Heritage Committee, which met for its 33rd session, its members selected from among the 186 countries that have ratified the 1972 World Heritage Convention. These are heritage sites that require funds, technical support, media attention or special measures to ensure their survival. Natural disasters are the least likely threat; indeed, the problems facing most of the 30 sites currently on the Danger list is a roll-call of humanity’s self-inflicted ills, ancient and modern: war, rampant overdevelopment, manmade climate change, to name but a few.

International protection

UNESCO (the United Nations Education, Scientific and Cultural Organization) launched its most famous international safeguarding campaign in 1959: the relocation of the temples of Abu Simbel and Philae following Egypt’s decision to build the Aswan High Dam. Some 50 countries donated half the \$80 million it took to save the archaeological site from flooding.

The same problems persist today. One of the three most recent additions to the Danger list, in 2007, Nikolo-Koba National Park, Senegal, is threatened by government plans to build a dam on the river Gambia at Mako, a few kilometres upstream of the park. The ancient city of Samarra, in Iraq, one of a number of casualties of war, was also elevated to code red in 2007, while the third site, the Galapagos Islands, Charles Darwin’s ‘little world within itself’, is at risk from tourism, introduced domestic animals and bird flu. It’s understood that the Galapagos will be under discussion in Seville, but unlikely they’ll be removed from the Danger list anytime soon.

‘Once problems such as these have taken hold they can be extremely expensive and resource-intensive to bring under control,’

says David Santillo, senior scientist at the Greenpeace Research Laboratories in Exeter. ‘The Ecuadorian authorities are continuing to make major efforts to eradicate invasive, non-endemic species and curb the spread of disease among sensitive populations of birds, and have redoubled their efforts since the islands were listed as “in danger” in 2007. There have been some success stories as a result, but only time will tell whether they can reverse the decline and find a balance between the increased visibility and revenue that comes from the rapidly growing tourism industry and the measures needed to protect the very natural heritage on which those developments rely.’

‘There is nothing legally binding about the convention: if Germany wants to continue building a bridge in the heart of the Dresden Elbe Valley it may do so despite the threat of being struck off the list’

Policing world heritage

Tim Badman is World Heritage special adviser for the International Union for Conservation of Nature (IUCN), which carries out the technical site assessments upon which the World Heritage Committee makes its judgements. He says the Danger list is intended to encourage support for threatened sites through international help and media attention.

‘The ideal is that the state itself volunteers information on which of its sites needs special assistance. We receive advice from a state, community or NGO, gain admission to the site and pass on our recommendation to the committee. We do not undertake recommendations to the Danger list lightly.’

Inclusion on the list has had some notable successes, and may yet see results in the Galapagos. Kishore Rao, deputy director of the UNESCO World Heritage Centre, points to Angkor in Cambodia, removed from the Danger list in 2004, the Old City of Dubrovnik in Croatia, removed in 1998, and the Ngorongoro Conservation Area in Tanzania, removed in 1989.

‘There has been a lot of effort both nationally and internationally to tackle the

problems facing the Galapagos,’ he says, ‘and inclusion on the Danger list has had a salutary effect in implementing corrective measures.’

A multi-faceted challenge

The threats facing natural sites are necessarily of another order to those facing cultural sites. Persuading Egypt to rethink plans for a motorway near the Giza pyramids, or Russian Prime Minister Vladimir Putin to order the rerouting of an oil pipeline on the shores of Lake Baikal is one thing – but asking all countries to limit emissions? Curtail industrial agriculture? Curb development?

‘Countries have an obligation and responsibility to live up to their commitments under

the UNESCO convention, but other bodies and conventions – such as the Kyoto protocol and United Nations Framework Convention on Climate Change – have the remit of tackling global warming issues,’ says Rao. ‘UNESCO’s World Heritage programme is about adapting sites to these global challenges, making the system more resilient and looking at what can be done on a site-by-site basis at a local level.’

There is nothing legally binding about the convention. If Germany wants to continue building a bridge in the heart of the Dresden Elbe Valley – an endangered site also discussed in Seville – it may do so despite the threat of being struck off the list. In 35 years that fate has befallen only one site: the Arabian oryx sanctuary in Oman, delisted as a result of Oman’s decision to reduce the size of the site by 90 per cent in order to facilitate hydrocarbon prospecting. ‘Outstanding universal value’ is all well and good, but it may not compete with development.

David Santillo sees the value in raising the profile of endangered natural and human heritage, the access to increased protection and maintenance funding that the designation brings, but finds the initiative necessarily limited in the face of a global threat.

‘Even the stringent measures currently in

place within many World Heritage Sites may prove insufficient to protect them against the impacts of increasingly rapid climate change, acidification of the oceans and overall loss of biodiversity,' he says. 'Vital regulatory "islands" in a world of overexploitation that they are, we cannot rely on the management of a list of designated heritage sites, however long, in order to preserve the natural environment. Only by acting globally and concertedly to address the unsustainability of human activities, to tackle the causes of climate change and ecosystem destruction at source, can we ensure a future for natural systems on the planet.'

What the experts say...

UNESCO is to launch its own report on the subject of World Heritage in Danger – how the designation is used, how it can be used more effectively. In the meantime, the *Ecologist* asked some environmental experts for their opinion on which threatened sites require international protection.

Dr David Santillo, senior scientist, Greenpeace Research Laboratories, School of Biosciences, University of Exeter

The sites covered by the World Heritage designation are inevitably a tiny fraction of the areas worthy of designation and protection, not just for their heritage value but, in the case of natural sites, for their inherent value as components of natural systems and the complex role they therefore play in supporting life on Earth and providing resilience to human induced global change.

By far the biggest area of the planet overall, namely the deep sea, currently receives practically nothing in the way of international protection, despite being home to a huge diversity of fragile and sometimes unique habitats and ecosystems. It may be time, therefore, for UNESCO and parties to the World Heritage Convention to look beyond national boundaries and designate a network of natural heritage sites in the global commons of the high seas. Such an initiative, providing it were supported by the necessary commitments and resources to police, could make a major contribution to the global network of marine reserves that is so widely acknowledged to be essential to the future of our oceans.

Jonathan Mazower, campaigns coordinator, Survival International

There are many areas of indigenous land that are currently unprotected. This causes not only environmental devastation but also real hardship and suffering to indigenous people. Two key areas are the rainforests of the Peruvian Amazon, currently in the grip of a major oil boom, endangering the existence of uncontacted tribes, and Borneo, where huge areas of tribal peoples' ancestral homes have been cleared of forest and turned into oil palm plantations.

What indigenous people need is not necessarily for these areas to be listed as World Heritage sites, but simply that they themselves be recognised as the rightful owners of their land, in accordance with international law.

Mary Munson, legal director, Center for Earth Jurisprudence

The Florida Everglades belongs on the list of World Heritage Sites in Danger. It needs a massive restoration effort, yet after millions of dollars spent creating a plan, we have a long way to go before success can be reached, and there remain major threats that the plan does not even address. Many people believe that the Everglades is on the endangered list... and it was [from 1993] – but two years ago UNESCO removed it. This delisting was unwise and misleading. The Everglades restoration plan has not even had a chance to bring back life-giving water flows, since major projects have not even broken ground yet.

The Everglades is also one of the world's most vulnerable areas to the devastating effects of sea-level rise, since it is made up of such low-lying land. Heavy metals and other airborne contaminants pose a major threat to the sensitive vegetation. Building and water withdrawals in surrounding areas are seeping vital waters out of the Everglades. Decreased water flows in the Everglades are changing the ecosystem of Florida and Biscayne bays. The site should not have been removed from the list; in light of these problems, it should go to the top of list in terms of attention and public support.

Dr James Cooper, head of government affairs, Woodland Trust

We would like to see more of our finest ancient woodland sites and sites with ancient trees designated as World Heritage Sites. Broxbourne Woods National Nature Reserve is one of the largest and most northerly expanses of sessile oak/hornbeam woodland in Europe, and contains two of the Woodland Trust's finest ancient woods in its care – Hoddesdon Park and Wormley. It has already been designated a Special Area of Conservation. Moccas Park is one of the finest examples of parkland in the UK, a Norman deer park set in a Capability Brown landscape supporting many ancient trees. It is currently designated a Site of Special Scientific Interest and National Nature Reserve.

The real conservation challenge for ancient woodland is in fact to ensure its domestic protection first. We currently have 460 cases on our books of ancient woods under threat – an incredible statistic when this is the closest thing we have to rainforest in this country.

Fred O'Regan, chief executive officer, International Fund for Animal Welfare (IFAW)

In 2000, IFAW led an effort to protect Laguna San Ignacio, the last unspoiled Pacific grey whale nursery in the world. Mitsubishi wanted to build the world's largest salt factory right in this middle of this critical birthing lagoon. Located on Mexico's Baja California peninsula, it is part of the El Vizcaino Whale Sanctuary, a World Heritage site. This recognition was critical to the campaign to protect Pacific grey whales.

The World Heritage programme needs to look at ecosystems unique to the natural world. We are working hard to rebuild protected areas that have, nonetheless, been denuded of wildlife. In northeast India, we're returning elephants, rhinos, and other animals to Manas Wildlife Sanctuary [placed on the Danger list in 1992], but other, ecologically diverse habitats, such as Tsavo National Park in Kenya, should be considered for inclusion.

Eifion Rees is a freelance journalist

Can charcoal save us?

Biochar - the charcoaled remains of agricultural waste - is being hailed as a key way to reduce levels of atmospheric CO₂. But is the science sound, and is there enough 'waste' to go round, asks **Almuth Ernsting**

In Australia, opposition leader Malcolm Turnbull has condemned the government's climate policy as inadequate. Not because the targets are so low that, if agreed globally, they would almost certainly put us on track towards a greater than 2°C rise in global temperature. Nor because all of the targets could potentially be met not from real emissions reductions, but instead from 'offsets' abroad. Rather, his party (which, while in power, refused to take any action against climate change) now advocates that the country can achieve major reductions in emissions without any restrictions on coal burning. Instead they claim that targets could be met by applying large quantities of fine-grained charcoal to the soil.

When biomass is exposed to high temperatures with little or no oxygen present (a process called pyrolysis) it yields two types of fuel that can be used for heat and power or be refined into transport biofuels. It also produces charcoal. Somewhere between 12 and 50 per cent of the carbon is retained in this charcoal, depending on the process. The more energy gained, the less charcoal produced. Bioenergy and 'biochar' (the name for charcoal used in soils) can be produced in small stoves, but a growing number of companies are building industrial-sized pyrolysis plants.

Advocates claim that grinding charcoal down and ploughing it into the soil can dramatically reduce atmospheric CO₂ levels. The carbon in biochar, they claim, will be permanently buried underground. Biomass is classed as 'carbon neutral' because emissions caused by burning are theoretically offset by photosynthesis as the plants regrow. Biochar enthusiasts take it a step further, claiming it is actually 'carbon negative' i.e. would

actually draw down CO₂ from the atmosphere if large plantations of trees were grown, charred, buried and the process repeated again and again. However, this ignores the fact that monocultures, whether of trees or crops, are major sources of emissions, because they drive the conversion of carbon-rich natural ecosystems, and because they require high energy inputs as well as fertilisers which are linked to emissions of nitrous oxide, a greenhouse gas 300 times as powerful as carbon dioxide.

What about charring waste products? The problem is that 'residues and wastes' - meaning the removal of deadwood, tree stumps and roots, twigs and undergrowth - can themselves cause emissions as forests are depleted, and too often ecosystems that play an essential role in regulating the climate are degraded.

Keeping carbon in the ground

Let's suppose we could find a sustainable source of biochar. Would the carbon stay where we put it? Advocates claim that the carbon in biochar will remain in soils for thousands or tens of thousands of years, that it will make soils more fertile and reduce nitrogen runoffs.

Some seem to regard biochar as the answer to most current crises. According to the Biochar Fund, which works in Central Africa, it offers an answer to climate change, hunger and deforestation. The manager of an Australian company, Crucible Carbon, is

enthusiastic:

'When I first heard about biochar the hairs went up on the back of my neck,' he said. 'This is the best news on climate change I've ever heard.'

So how well-founded are the claims made for biochar's climate and soil credentials? Claims are largely based on two types of evidence: the first one is the highly fertile and carbon rich soils which have been found in Central Amazonia, called terra preta or 'black earth'. Terra preta was created by indigenous farmers between 500 and 2500 years ago by adding charcoal - along with a highly diverse combination of organic residues including river sediments, animal bones, kitchen waste and manure - to the soil. Their techniques were developed over a long time frame, and were adapted to particular local soils and climate conditions.

A second line of evidence comes from laboratory and short-term greenhouse studies. These confirm that charcoal is an important factor in the soil fertility and the stability of carbon in terra preta.

However the results from modern biochar vary widely. This is not surprising because soils are diverse, complex and dynamic ecosystems. Laboratory and greenhouse studies with controlled conditions cannot reveal the full picture.

In medicine, no new drug could be released without clinical studies. The equivalent for agriculture are field studies. These are worryingly scarce for biochar, particularly any long-term studies which look both at impacts

on soil carbon and soil fertility. To date, one field study looking at both carbon and soil fertility in one area in Amazonia has been published and offers mixed results.



No other such field study has been published.

Greenhouse studies suggest significant differences in the effects of biochar according to the temperature at which biochar is produced, the type of biomass used, the type of soil and the crops to which it is added. In some cases, fresh biochar boosts plant growth, in others it stunts growth. Some biochars encourage beneficial fungi, others discourage them. What is true for biochar from rice husks used on sandy tropical soil probably won't be true for biochar from conifers on humus-rich soil in the UK. Without a wide variety of published field studies, impacts of different biochars on different soils simply cannot be predicted.

Biochar, with added extras

What is certain, though, is that charcoal on its own cannot feed plants, even if in some cases it can make fertilisers more effective. Compost and other organic amendments or synthetic fertilisers are also needed. Biochar companies are therefore looking at combining charcoal with fossil-fuel based fertilisers. Eprida, for example, is pioneering a fertiliser made from charcoal which has been used to scrub nitrogen-rich gases from coal power stations.

Many advocates downplay such 'industrial' practices and speak of converting only agricultural and forest wastes and residues to charcoal. Yet, as environmentalist Vandana Shiva has pointed out, humus from the decomposition or composting of 'wastes and

Some of it may have simply been eroded and washed into the ocean, but analyses of marine sediments do not support this hypothesis. A study in Western Kenya estimated how much charcoal remains in the soil from a series of previous wildfires. Seventy-two percent had been lost within two or three decades.

Also, there's no guarantee that something won't work out how to eat the pure carbon and then breathe it back out as CO₂ - effectively rendering the whole process pointless. One laboratory study showed that certain microbes can live on black carbon and turn it into carbon dioxide. The species appear to be rare now, but they might well thrive if charcoal is added to vast areas of soil. At least as worrying is the evidence that charcoal boosts levels of soil microbes that decompose the organic carbon in humus, turning much of that into carbon dioxide. All of this suggests that a lot of the carbon in charcoal and soils can still find its way back into the atmosphere, even though the processes are not fully understood.

What goes in must come out

Another concern is pollution: any toxins in wood or crops are concentrated in ash and charcoal, whether they are pesticide residues or heavy metals from background air pollution. In fact, the first commercially sold biochar, EternaGreen, is made not just from biomass but also from old tyres and municipal solid waste, the burning of which is known to produce highly toxic compounds. Even

heat. Charcoal has reportedly been used in Japan to help melt snow and lengthen the planting season – but this effect would be far less desirable on a warmer planet.

Moving fast

In spite of the concerns and unknowns, it is not just the Australian opposition party that proposes large-scale commercialisation of biochar. During the United Nations negotiations for a post-2012 climate agreement, proposals to include biochar into the Clean Development Mechanism (a financial system for funding climate change projects in the less-industrialised world) are being debated. Biochar would then become yet another way in which European or US companies could 'offset' the burning of coal, gas and oil and thus avoid having to reduce emissions.

Including biochar in a new climate agreement raises the spectre of large new industrial plantations. The Chair of the International Biochar Initiative (IBI), Professor Lehmann, has claimed that biochar could sequester between 5.5 and 9.5 billion tonnes of carbon annually – that means pyrolysing a quantity of biomass containing twice as much carbon as is released from the burning of fossil fuels every year. Harvesting biomass for such large quantities of charcoal would require a minimum of 500 million hectares of plantations: about one and a half times the size of India, possibly much more. Claims that there are massive quantities of 'wastes' available for such purposes are unrealistic and other industries, such as biofuel and biogas companies are competing for what 'wastes' there are.

A new report by the United Nations Environment Programme warns that 'the impacts of large-scale biochar production on biodiversity and long-term agricultural sustainability (e.g. nutrient depletion) are unknown'. In other words, large-scale biochar production could potentially start to replicate the monocultures planted for conventional biofuel, which involve deforestation, the displacement and eviction of rural communities and indigenous peoples, and increased hunger as food production is displaced.

A United Nations website lists the charcoal-rich terra-preta soils in Amazonia next to other biodiverse and sustainable farming systems developed by indigenous peoples and rural communities around the world. What links those different systems is biodiversity and adaptation to specific local conditions. In parts of Amazonia, charcoal was one element in sustainable farming systems. Isolating this element, industrialising it and promoting it as a 'one size fits all' global solution could lead us down a familiar path.

Almuth Ernsting is a researcher with Biofuel Watch

'There's no guarantee that something won't work out how to eat the pure carbon and then breathe it back out as CO₂, rendering the entire process pointless'

residues' is 'living carbon', while charcoal is 'dead carbon' that cannot normally be digested by essential soil organisms. She points out that organic farming has been shown to increase the amount of carbon in soil and that soil fertility depends on 'living carbon' in humus. Replacing humus with charcoal on a large scale could have negative consequences.

Evidence for the long term climate benefit of biochar is so far weak. It is known that 1-20 per cent of the carbon in biochar will turn into carbon dioxide soon after it is ploughed into the soil. What about the rest? Given the lack of opportunity for long term studies of modern biochar, it makes sense to look for evidence from similar situations. One of these is the charcoal created during wildfires.

If 80 per cent or more of wildfire charcoal produced since the ice age had been retained, soils worldwide would be far richer in charcoal than they are. Where has it gone?

biochar from untreated wood is not always 'clean': Norwegian scientists recently warned that wood ash contains such high levels of cadmium, zinc and lead that it should not be used as fertiliser and qualifies as toxic waste.

And finally, there is the question of how to incorporate biochar into the soil without making climate change worse. Biochar will almost certainly require tillage which disrupts soil structures and causes the loss of soil organic carbon. Also, fine biochar particles can be blown away by wind. In a recent trial in Canada, preliminary results suggest that 30 per cent of the biochar applied to a field was blown away as dust during application. Windborne dust can travel across large distances, for example from the Sahara to the Amazon Basin. Already, dust is implicated in increased snow melt on North American mountains and faster melting of the Arctic ice. Black dust could significantly worsen this impact, since it will retain more



Shell settles for \$15.5m, but what changes?

Faced with a high-profile lawsuit in New York, oil giant Shell reached a settlement in June with the families of murdered Nigerian activists. Instantly, questions were raised. Were the plaintiffs happy with the money? What precedent is set?

Andy Rowell, from the Shell Guilty coalition, explains

As the news broke that Shell was forced to settle a lawsuit for human rights abuses in Nigeria for \$15.5 million, emails have been pouring in asking what this means for the plaintiffs, the Ogoni people and the ongoing struggle for human and environmental rights in the country?

People are asking whether this is a victory for the plaintiffs or a victory for Shell. We would argue it is most definitively in favour of the former.

Despite Shell's overpowering legal and financial might it has had to pay a significant sum of money to the plaintiffs and the minority Ogoni people of Nigeria. The good news is that, in the court of public opinion, Shell is guilty, even though the company has admitted no liability. You do not pay over \$15 million if you are innocent of wrongdoing.

For the son of the murdered activist Ken Saro-Wiwa, Ken Wiwa Jr, there is no doubt that this is a moment not of celebration but of pragmatic relief that some kind of line can be drawn under his fight for justice for his father. Writing in the *Guardian*, he said: 'There was no hat-in-the-air moment, no popping of champagne corks ... Anti-climax doesn't quite describe this moment.'

He continued: 'In the end a settlement is a compromise; both parties agree to settle their differences by meeting in a so-called middle. That middle is a matter of perspective of course. To some this must be bewildering. To others it was too long in coming. In the end it is only those who are intimately involved, who have everything to lose and everything to gain that have to make a decision that will not satisfy everyone.'

In weighing up whether to settle or not, the plaintiffs would have been swayed by the offer of much-needed cash to help the underdeveloped Ogoni region of the oil-rich Niger Delta. So \$5 million of Shell's money will create the Kiisi Trust. The word 'kiisi' means 'progress' in Ogoni. This Trust will allow for initiatives in Ogoni for educational endowments, skills development programmes, agricultural development, women's programmes, small enterprise support, and literacy.

But that is not all. There is no doubt that, even though it may never make it to a jury trial, the case has legal ramifications: Ken Wiwa Jr argues that 'history will show that this was a landmark case. Multina-

tionals now know that a precedent has been set, that it is possible to be sued for human rights violations in foreign jurisdictions.'

Over twelve years, the plaintiffs have scored blow after blow, and in 2000 forced the US courts to recognise that companies involved in human rights abuses abroad could be held accountable under US jurisdiction.

This case will continue to make waves as a myriad of new documents that show the true depth of collusion between Shell and the Nigerian authorities come to light. These documents show that Shell has consistently lied to the public and its shareholders about the extent of its relationship with the Nigerian military. It colluded with the higher echelons of the military junta.

Shell may have tried to conceal the true environmental impact of its operations, but no PR campaign can hide the truth forever. As Steve Kretzmann from Oil Change noted recently, 'Lawyers told us quite clearly that one of the main reasons that Shell settled was because of the media and activist pressure that we brought. Just a few months ago, a lawyer close to Shell told us that they would settle "when hell froze over" and he "skated on it": but that was before our ShellGuilty campaign. Over 11,000 of you sent messages to Shell... That pressure made all the difference.'

But Shell will be wrong if it thinks that getting out its sizeable cheque-book will mean the end of the story. The company is routinely flaring gas in the Niger Delta despite years of promises to put out these toxic fires. There is still routine pollution. All these issues and many more must be addressed before there can be justice for the people of the Niger Delta.

But then the plaintiffs recognise that this is not the end of the story. As their statement says: 'To our people, we say Ake, Beenu, Nonu, Sitam. The struggle continues.'

Andy Rowell is a member of the ShellGuilty Coalition

For more information, visit www.shellguilty.com, and for the statements of the plaintiffs visit www.wiwavshell.org



Two Nigerian children look on as gas is flared behind an earth bund. Despite a landmark payout, Shell continues to flare gas in this way throughout the Delta, causing pollution and respiratory problems. Photo: Shell Guilty campaign