

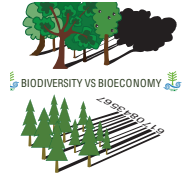


Bio-economy versus Biodiversity



***By Ronnie Hall, with contributions from Rachel Smolkers,
Almuth Ernsting, Simone Lovera and Isis Alvarez***

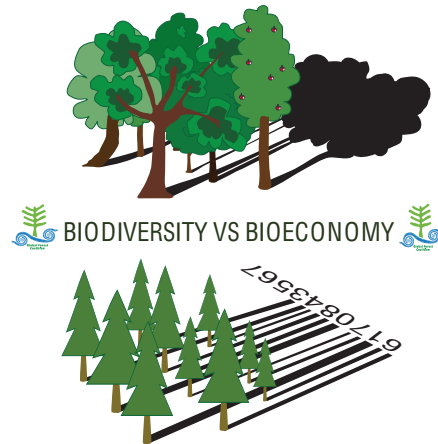
Global Forest Coalition, 2012



Bio-economy versus Biodiversity

Summary

As part of the 'green economy' approach scheduled for negotiation at the 2012 Earth Summit in Rio de Janeiro, there is now a proposal to develop a 'post-fossil fuel' bio-economy, championed by the European Union, the U.S. and Brazil in particular. This bio-economy approach is heavily based on the use of biomass, both as a fuel and as a raw material from which to manufacture a wide range of products, including plastics and chemicals. This will be made possible courtesy of a range of technologies including genetic manipulation, nanotechnology and synthetic biology,.



While the idea of using renewable resources instead of fossil fuels is a good idea in theory, the way in which the bio-economy approach proposes to achieve this goal is at best deeply flawed and inequitable, and at worst downright dangerous. The planet's capacity to produce biomass is limited, and increasing demand for land is already leading to the destruction of forests and biodiversity, escalating hunger, and conflict over land. Without reducing consumption and demand for energy and products, the sheer scale on which biomass would have to be produced to meet the demands of a global bio-economy would severely exacerbate these problems.

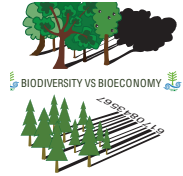
Proponents of the bio-economy argue that new technologies, such as the production of algal oil in aquatic environments, would minimize these pressures. Yet these innovations are uncertain at best, and the commercial production of algal oil certainly looks unlikely at present. While promises of a 'clean, green future' may allow risky new technologies to attract investment, the reality on the ground is that in the near and medium term future there will be increased pressure on land and forests. Even though there is much hype about new, high technology approaches as part of the bio-economy, the current impacts are primarily linked to simple, relatively cheap combustion and refining technologies, including 'first generation' biofuels and a very rapidly growing, subsidized push to burn wood for electricity and heat.

The bio-economy proposal is not about protecting the environment: it is about promoting the economy – in spite of clear indications of the harmful impacts that are already resulting from massive new demand for biomass, including loss of biodiversity and escalating hunger and conflict. The bio-economy agenda is especially attractive to fossil fuel companies who want to be seen pursuing an exit-from-oil strategy; and to biotechnology companies desperately in need of a Trojan horse to provide safe passage for risky and unpopular new technologies.

This is entirely at odds with parallel proposals to create new markets in ecosystem services with a view to protecting biodiversity and mitigating climate change. Forests, for example, are being targeted as sources of wood for bio-energy, but at the same time, they are being viewed as carbon-sequestering biodiversity rich habitats in need of protection. What these proposals do have in common, however, and the reason they are both promoted under the 'bio-economy', is that they are both designed with the primary goal of creating profitable business opportunities, regardless of any negative social and environmental consequences that may be incurred.

Indeed, creating new markets for ecosystem services takes the 'commodification of life' to a new level. Should these proposals come to fruition, every living thing and natural process could be potential fodder for this new mega-industry, especially if new technologies come into play, and industries currently outside the 'life' sector come looking for new fuel sources, new technologies and new profit-generating opportunities.





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Instead of promoting a socially-blind 'green economy', an alternative world view would recognize the bio-cultural approaches of indigenous peoples and local communities who have long succeeded in developing sustainable livelihoods, a '*buen vivir*' in harmony with the ecosystems they live in. Territories and areas conserved by indigenous peoples and local communities, women-driven forest conservation and restoration initiatives, community initiatives that sustain food and energy sovereignty, and the efforts of small peasants to produce food in harmony with our planet all serve as inspiring examples of ways in which local economies build on the principles of care, harmony with nature, human rights and sovereignty, and contribute to the well-being of both community members and the planet as a whole.

Introduction: Rio+20, green economics and the 'bio-economy'

The idea of developing a 'green economy' has been gaining traction over a number of years. As a result, this approach – which currently encompasses contradictory proposals to develop a biomass-based 'bio-economy' and to promote and protect biodiversity and ecosystems using new financial mechanisms – is headlining the agenda for the Rio+20 Earth Summit in June 2012.

Politicians have pounced upon the political and economic opportunities presented by potential new technologies and their implications for promoting a convenient and supposedly 'green' economic agenda. In many quarters - especially amongst governments now facing deep economic crisis - only economically-oriented 'solutions' to environmental challenges, which promote industrial and economic growth, and provide 'green jobs' are considered tenable.

UNEP is very much engaged in driving the green economy initiative, having published a 600-page report defining and detailing it in 2011 (UNEP, 2011). The upbeat tone of the report and UNEP's enthusiasm for capturing the attention of world leaders cannot be denied. Rather bizarrely, however, this report embraces the neoliberal perspective wholeheartedly, while claiming political neutrality.¹ In addition, UNEP effectively turns a blind eye to the potential negative social and environmental consequences of promoting a bio-based economy,² and has next to nothing to say about the need to reduce demand and overconsumption by wealthy nations. For example, the report notes that global demand for wood and fiber is expected to increase dramatically in coming decades, but instead of looking for ways to reduce this demand, it prioritizes looking for ways to *meet* it through mechanisms such as offering incentives for plantation forestry.



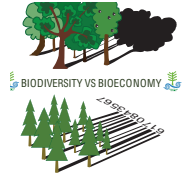
FSC certified disaster zone in Ireland.

The UNEP report is cowardly in the way it touches upon but then sidesteps many issues that it knows to be critical. Tucked away in one small corner of the forests chapter, for example, one can find the following reflection: *"It is also possible that a large proportion of small-scale informal forest landscapes...are sustainably managed. This can be judged by the longevity of the forest resources, passed from generation to generation, and evident production of multiple goods and services. However there is little information to go on apart from the minority of forests that are certified."* (UNEP, 2011:166) The matter then seems to be dropped. Is it really politically impossible for UNEP to conclude that herein lies the basis for a real, effective and equitable solution to forest loss?

¹ See TNI (2011) for a more detailed explanation.

² Such consequences are occasionally referenced but do not seem to lead to concrete recommendations.





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The real bio-economy agenda, who's driving it and why

A subset of this debate, the 'bio-economy' agenda, is rapidly gaining traction amongst politicians and business, especially in industrialized countries. The prospect of switching to 'bio-based' products and technologies, which would enable business to profit from supposedly switching away from fossil fuels, has clearly flipped the political 'on' switch in certain countries, encouraging the use of subsidies and other policy instruments to drive the bio-economy forward. Certain countries are eagerly ushering in a new industrial era, without even stopping to consider whether it will cause more problems than it solves.

What *IS* the bio-economy?

'Bio-economy' is the current buzzword amongst numerous intergovernmental negotiators and academics tasked with finding solutions to current environmental crises without slowing economic activity. Many governments, presumably wary of further economic shocks, and increasingly at the beck and call of the world's powerful transnational corporations, have pounced on the 'bio-economy' as a potential 'get out of jail free' option that they can promote without political fallout. But what does it actually mean?

The 'bio-economy' focuses specifically on ecosystem-based products and services, based on the unproven assumption that this approach will automatically be more sustainable than using fossil fuels (conveniently it certainly does *sound* sustainable). Yet the consequences of adopting the bio-economy approach could be no better than our current reliance on climate-wrecking fossil fuels, especially in terms of the impact of a massively increased production and use of biomass on hunger, land rights and the environment.

One of the key reasons for this is that proponents of the bio-economy support the use of biomass both as a means of fueling production and as a resource from which a wide range of 'bio-based' products could be produced, including plastics, chemicals and drugs. This approach seeks to commodify ecosystems and natural processes, putting a price tag on nature and the commons, and marketing these to the highest bidders.

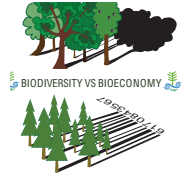
Bio-economy proponents that have at least some awareness of the implications of massively increasing demand for biomass on land often turn attention to the oceans and aquatic ecosystems as new sources of sugars and oils, including from algae, claiming these resources would reduce such pressures. But this is a spurious argument, used to gain acceptance of the entire bio-economy agenda. In reality the commercialization of algal oil has so far proven impossible (primarily because algae prioritize either growth or oil production (Waltz, 2009; Lane, 2012)).

Industries including electricity generation, chemicals, plastics, steel and cement production, and aviation, and even the US military¹ are increasingly seeking biomass alternatives to fossil fuels (although these can also be combined *with* fossil fuels). They are also looking at ways to extract more valuable fractions from the biomass for different additional industrial uses.

The European Commission, a key proponent, defines a "*post-petroleum*" bio-economy as "*an economy using biological resources from the land and sea, as well as waste, as inputs to food and feed, industrial and energy production...[which] also covers the use of bio-based processes for sustainable industries. Bio-waste for example, has considerable potential as an alternative to chemical fertilizers or for conversion into bio-energy.*" (EC, 2012)

Many of these new uses of biomass depend on the advance of risky new technologies, including genetic manipulation, nanotechnology and synthetic biology. However, while these 'high-tech' approaches are being researched and developed, there is no doubt that in the near to medium future, increased pressure on land and forests for the bio-economy is, for now, based on simple, relatively cheap combustion and refining technologies that already exist, in particular for energy. Policies that are supposed to be supporting 'renewable energy' are rapidly translating into a huge decidedly low-tech and subsidized push to burn wood for electricity and heat, and this is already creating vast new demand for wood, crops and other biomass.





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The bio-economy approach offers politicians in industrialized countries an opportunity to be seen to be doing something about meeting ill-defined 'renewable energy targets', while maximizing opportunities for economic growth and securing a constant supply of energy. There is precious little concern about the environment, or about impacts in other countries, apart from the usual platitudes about providing jobs.

But just where are all these bio-resources going to come from? How can bio-based economic policies possibly be implemented without having dramatic impacts on food security? And what are the implications for forests and other resources? Even the most modest 'sustainable bioenergy potential' study suggests converting 386 million ha of supposedly "*abandoned agricultural land*" to new plantations (Field *et al*, 2008). Another paper goes much further: having reviewed 17 separate studies, it predicts that an average of 10 million ha of plantations may have to be established *annually* to meet predicted biofuel demand in 2050 (Berndes *et al*, 2003).

The proposed harvesting of sea-based biomass is unlikely to stop land-grabbing. If land to produce biomass can be acquired relatively cheaply, especially in regions where land tenure is weak or non-existent, it will be. Harvesting sea-based biomass also raises concerns about new corporate grabs of coastal land and fisheries.

Economic jargon rules

Environmental officials routinely take an 'economic approach' to the environment as demonstrated in the way they sometimes describe the environment. For example: "*The wider economic roles of forests in a green economy include: as factories of production (producing private goods from timber to food), as ecological infrastructure (producing public goods from climatic regulation to water resource protection) and as providers of innovation and insurance services (forest biodiversity being key to both).*" (UNEP, 2011: 161)

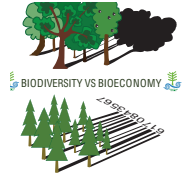
Some of the world's wealthiest and most influential companies and investors are involved in developing and promoting this potentially lucrative agenda, in spite of the involvement of many of them in creating current crises in the first place. They have been actively invited to the negotiating table, since this is an agenda explicitly designed with their interests in mind. The bio-economy agenda is especially attractive to fossil fuel companies who want to be seen pursuing an exit-from-oil strategy; and to biotechnology companies desperately in need of a Trojan horse to provide safe passage for risky and unpopular technologies including genetic engineering, nanotechnology and synthetic.

Corporations converge on biomass

The world's largest oil companies – including Shell, BP, Total, Petrobras, Chevron, Statoil, PetroChina, ConocoPhillips, Eni and ExxonMobil – have already spent billions of dollars investing in and scaling up biofuels production: 30 billion gallons were produced in 2011 (Pike, 2012). Shell and BP are considered best placed to benefit from the booming biofuels industry, with both engaged in producing biofuels from current 'first generation' sources such as sugar cane, and scaling up production in Brazil in particular. Both also have "*strong commitments to commercializing advanced biofuel pathways.*" (Smartplanet.com, 2012) Other companies are also preparing to ramp up production in the near future though: PetroChina, for example, plans to add 1.1 million tonnes of biofuels production capacity and import 470,000 tonnes of those fuels by 2015, from countries such as Brazil (Reuters, 2011).

Interest in new technologies to convert biomass into fuel and products is not confined to energy companies either: "*They are developing new technologies to transform plant-derived sugars from food and fibre crops, algae and other forms of biomass into industrial products. Major players include: Big Energy (Exxon, BP, Chevron, Shell, Total); Big Pharma (Roche, Merck); Big Food & Ag (Unilever, Cargill, DuPont, Monsanto, Bunge, Procter & Gamble); Big Chemical (Dow, DuPont, BASF); and the Mightiest Military (the U S military).*" (ETC, 2011) Alliances are also emerging between energy companies and pulp-and-paper and other timber companies (ETC, 2011).





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The EU is pushing the bio-economy agenda particularly hard in intergovernmental negotiations. Given its ongoing concerns about energy security and accessing its 'fair share' of the world's natural resources (as evidenced by its attempts to remove export restrictions on natural resources through World Trade Organization negotiations) this is unsurprising. The bio-economy approach also allows policy-makers, especially in the EU, to overcome opposition to climate change policies from the car manufacturing and oil industries.

The EU aims to ensure resource security in terms of food and animal feed, energy and materials; and to promote *"smart green growth"* (EC, 2012a). To this end the European Commission adopted a strategy on bio-economy designed to shift the European economy towards *"greater and more sustainable use of renewable resources"* on 13 February 2012 (EC, 2012a).

The EU's strategy focuses on *"developing new technologies and processes for the bio-economy"* and *"developing markets and competitiveness in bio-economy sectors"* such as converting food waste into energy. This explicitly includes research and innovation in *"enabling and industrial technologies (eg biotechnology, nanotechnology and ICT)"* (EC, 2012a).

One key project given as an example of the collaborative efforts that the EU is supporting is FORBIOPLAST (FP7), which focuses on using forest resources for sustainable manufacturing. This project clearly demonstrates the real objectives of those supporting the bio-economy. The EC says: *"The world needs to reduce its dependence on petro-chemicals. Might the answer lie in our forests? A broadly-based European research consortium has been developing innovative ways in which wood-derived fibres and agroforestry by-products could replace petro-chemicals in a wide array of products – from car seats to plant pots."* (EC, 2012a).

Meanwhile, in the U.S. the Biomass Research and Development Act of 2000 was a major step towards the American vision for a bio-economy. In September 2011, the Obama administration announced plans for "Building a 21st century bioeconomy". Details of this 'blueprint' are expected to be announced soon. Meanwhile, Brazil, as an emerging world economy largely built on agriculture and forestry, with booming biofuels and biotechnology industries, has long touted the bioeconomy vision.

Bioenergy from biomass - fuelling future crises

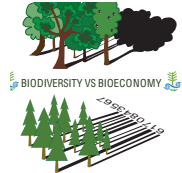
The use of biomass to fuel economic activity lies at the heart of proposals to develop a bioeconomy. In one sense the idea is nothing new, since biological materials such as wood are traditionally used for fuel, especially by those unable to access fossil fuels. In addition, new forms of bioenergy are already in use following the development and promotion of biofuels (liquid fuels developed from biomass feedstocks).

In another sense, however, this focus on bioenergy is one of the defining features of the new bio-economy agenda, specifically because it purports to move the global economy on to a post-fossil fuel phase, in which biomass is used to fulfill the majority of power requirements, as well as being the raw material from which a wide range of products is made (many of which are now made from the byproducts of fossil fuels). This is being used as a selling point for the entire, destructive biomass agenda.



Monoculture tree plantations in the Czech Republic.





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Ironically, those promoting the bio-economy generally distinguish between 'traditional' and 'modern' forms of bioenergy, promoting the latter over the former. What this means in practice is that community use of wood, manure and other 'residues' is being vilified as 'unsustainable' while agrofuels, and the production of electricity from biomass, are being strongly promoted as 'sustainable', which they are not.

Alternative reasons for the enthusiasm with which the bio-economy agenda is being pursued include alleged concerns about energy security, and a desire to promote the strategic needs and interests of large and influential corporations. The latter neatly explains the apparent contradictions between promoting biodiversity offsets and ecosystem services markets, at the same time as driving forward a form of economics that is based on destroying biodiversity. These reasons also explain why many politicians seem so set on ignoring an increasing torrent of evidence about the negative impacts that biofuels are already having, both in terms of climate change and biodiversity, and in terms of hunger.

These problems have been acknowledged in a recently published note from the Executive Secretary of the Convention on Biological Diversity (CBD),³ which recognizes many important recent reports showing that biofuels frequently result in more rather than less greenhouse gas emissions; create further pressure on limited water resources, resulting in soil degradation and increased use of fertilizers and agrichemicals; and often involve the cultivation of invasive species (CBD, 2012). The note acknowledges that because of the very low energy density of plant materials, very large land areas are required to supply sufficient quantities of biomass.

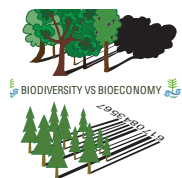
These impacts are also outlined in a report from the Scientific Committee of the European Union, which says that *"Several European Union energy directives encourage a switch from fossil fuels to renewable energy derived from plant biomass based on the premise that biomass combustion, regardless of the source of the biomass, would not result in carbon accumulation in the atmosphere. This mistaken assumption results in a serious accounting error...It is widely assumed that biomass combustion would be inherently 'carbon neutral' because it only releases carbon taken from the atmosphere during plant growth. However, this assumption is not correct and results in a form of double-counting, as it ignores the fact that using land to produce plants for energy typically means that this land is not producing plants for other purposes, including carbon otherwise sequestered. If bioenergy production replaces forests, reduces forest stocks or reduces forest growth, which would otherwise sequester more carbon, it can increase the atmospheric carbon concentration. If bioenergy crops displace food crops, this may lead to more hunger if crops are not replaced and lead to emissions from land-use change if they are."* (EEA, 2011)

As confirmed by the High-Level Panel of Experts on Food Security and Nutrition (HLPE, 2011), demand for biofuels has been responsible for most of the recent global growth in demand for cereals and oilseeds, and thus to a significant extent is responsible for food price rises and volatility and consequently increased hunger. However, these negative impacts are often indirect, complex, difficult to assess or quantify, and inherent to globalized markets (meaning that they cannot credibly be addressed by standards and certification). It has also been calculated that 'land transactions' involving at least US\$71 million and possibly as much as 203 million hectares worldwide were concluded between 2000 and 2010, particularly in Africa. Two-thirds of land transactions (for which details were available) were for biofuels (International Land Coalition, 2011).

It is often claimed that large areas of 'marginal, abandoned and degraded' lands are available, but those lands are frequently in use by pastoralists, small food producers, indigenous peoples and local communities. Conflicts and the violent displacement of entire communities result. Furthermore, biofuel and other companies tend to be most interested in fertile land with good rainfall or cheap irrigation. Future biofuels from algae and seaweed also pose a threat to pastoralists (should plans to

³ Scheduled for the Sixteenth meeting of the CBD's Subsidiary Body On Scientific, Technical And Technological Advice in Montreal, 30 April – 5 May 2012





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grow microalgae in deserts and semi-deserts go ahead), coastal communities and biodiversity, and fisherfolks.

It is also argued that biomass will be sourced from wastes and residues, but this is not what is happening. In the US and Canada for example, forests are being felled specifically to provide biomass (Greenpeace, 2011), with defined 'woodsheds' around biomass processing plants.⁴

There will also be an ever-increasing pressure to produce wood as quickly as possible, using reduced rotations and promoting *"questionable management practices and increased dependency on wood imports"* (GCB Bioenergy, 2012). This in turn reduces the carbon sequestration capacity of the trees being planted (GCB Bioenergy, 2012).

***"From a historical perspective, a transition from forest biomass burning to fossil fuels literally fuelled the industrial revolution, and consequently, caused rapid climate change. However, the collapse of biomass use enabled the recovery of largely degraded forest ecosystems...As such, C[arbon]-sequestration can be considered a side-effect of the transition of energy sources from wood to fossil fuels. Industrial-scale use of forest biomass for energy production would likely reverse this trend or at least reduce the carbon sink strength of forests."* (GCB Bioenergy, 2012)**

"Canadian provinces are diving into a "biomess" by opening the door to large scale clearcuts, salvage logging and highly damaging extraction practices that could double the forest industry's footprint on already damaged forest ecosystems. Whole trees and large areas of forest are being cut to provide wood that is burnt for energy." Source: Greenpeace (2011)

Burning biomass in the UK

In the UK, biomass plans announced by industry would require more than 60 million tonnes of wood to be burned every year, six times as much as the country's total annual wood production. The UK's energy company Drax has mooted plans to co-fire biomass from some 8 million tonnes of wood a year and plans have been approved for a further two new power stations that, together, would burn around 5.8 million tonnes of wood in addition. Drax has announced plans to invest in five new pellet factories in North and South America to supply their facilities. RWE has also been permitted to burn pellets made from up to 7 million tonnes of imported wood in just one power station at Tilbury. They own the world's biggest pellet plant in Georgia, US.

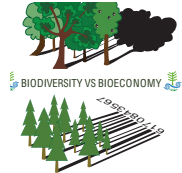
Most of the wood pellets for use in the UK would need to be imported, hence many UK companies are also investing in pellet-making facilities in other countries to export back to their facilities. A new and expanding global trade in woodchips and pellets has abruptly emerged.

Biomass expansion in the UK is driven by two key factors: Firstly, generous public renewable energy subsidies, which, if currently announced plans go ahead, will see over £3 billion a year spent on biomass burning. And secondly, the fact that energy companies are viewing biomass (co-firing as well as conversions) as the cheapest and most lucrative way of circumventing EU legislation on sulphur emissions, under which a large proportion of fossil fuel power stations would otherwise have to close by the end of 2015. Sources: Biofuelwatch (2011), ICIS (2011)

⁴ For an example of local wood sourcing proposed and how these 'woodsheds' overlap, see a map of proposed and existing biomass facilities in the SouthEastern US here:

http://www.southernenvironment.org/uploads/fck/file/biomass/biomass_facilities_detailed_map_table_new.pdf





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Biotechnology and genetically engineered trees

The European Commission's bio-economy proposal seems to be specifically designed to place the risky and under-regulated life sciences industry at the heart of a new 'clean, green world'. It suggests that there are only two choices – an economy based on fossil fuels, or one in which innovative bio-based production is facilitated by genetic manipulation, nanotechnology and synthetic biology.

Rather than being confined to the current life sciences sector, the bio-economy approach envisages these technologies becoming fundamental tools used by all agricultural and industrial sectors, with unknown future consequences.⁵ For example, there are already hundreds of companies specializing in commercial DNA synthesis (ETC, 2011).

“Synthetic biology companies are engineering synthetic DNA to custom-build algae and microbes that behave as tiny “biological factories.” The aim is to convert almost any biomass into almost any product. With billions of dollars of public and private investment over the past few years (including the world’s largest energy and chemical companies), synthetic biology sees nature’s biodiversity as a feedstock for its proprietary bugs – designer organisms that will be used to transform plant cellulose into fuels, chemicals, plastics, fibres, pharmaceuticals or even food.” (ETC, 2011:8)

Biofuel developments are also associated with risky new technologies including genetically-engineered (GE) trees, algae and bio-energy crops, and the development of synthetic organisms. There is certainly clear evidence that the climate change crisis is being used to promote the development and mass release of GE trees into the environment, as a means of feeding bio-energy production. This includes government, industry, university and research institution collusion to advance the development of GE trees specifically designed for bio-energy production in the US and globally. For example, the US Department of Agriculture planned to fast track regulatory procedures to reduce the time taken to review GE products – including ArborGen's GE eucalyptus tree - with a view to getting them to market in less than half the time it would have previously taken. ArborGen has a request pending with USDA to sell hundreds of millions of cold-tolerant GE eucalyptus seedlings commercially (GJEP, 2012).

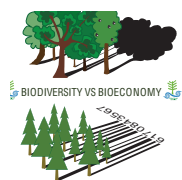
“Although conventional biofuels derived from commodity crops account for the bulk of production today, a proliferation of national blending mandates have triggered a stampede to commercialize advanced conversion pathways that rely on low cost, non-food feedstocks.” Source: Pike, 2012

At the same time, on the industry side, activities are under way to develop so-called 'sustainability criteria' for GE trees that would help them become eligible for certification under bodies such as the Forest Stewardship Council, which currently prohibits GE trees from being certified (GJEP, 2012).

While the efforts of GE trees proponents to bring these highly dangerous trees to commercialization are mounting, so is public opposition. This public outrage is well justified, given the dangers posed by GE trees - from flammability, to invasiveness, to the potential to contaminate native forests with engineered traits. These dangers, should GE trees be released *en masse*, are both inevitable and irreversible (GJEP, 2012).

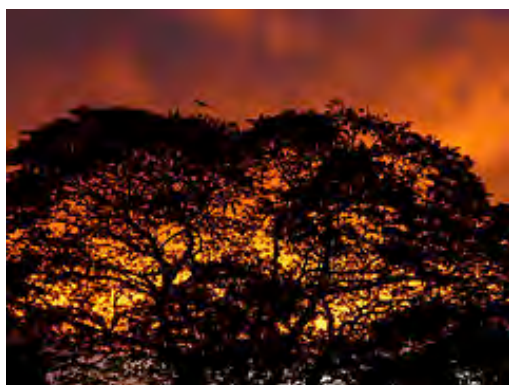
⁵ For more detail see ETC (2011).





Bio-economy versus Biodiversity

Banking the world's ecosystem services - the Midas mistake?⁶



Amazon sunset, Colombia.

Demonstrating a remarkable failure of logic, proponents of the bio-economy seek to create huge new demands for biomass to provide energy and materials for economic growth on a par with that experienced using fossil energy, while at the same time seeking to commodify and market the very ecosystem protections and services that are being destroyed. This disconnect is a giveaway, revealing how focused on the interests of business and industry some negotiators really are. Advancing profitable business opportunities and gaining access to land and resources are the underlying and unifying features of both proposals.

The 'Payment for Environmental Services' (PES) approach is intended to create new and profitable financial products to leverage private finance and thereby pay for the perceived cost of 'protecting' the world's ecosystem services (instead of having to pay for them from the public purse). Approved market mechanisms designed to engage the private sector include carbon markets, PES schemes including REDD+, and other 'innovative financing mechanisms' (IFMs) such as biodiversity offsets and ecosystem services markets.

Payment for Environmental Services schemes⁷

Payments for Environmental Services (PES) schemes are intended to increase the provision of environmental services such as the protection of biodiversity and watersheds, by assigning value to them and paying people to facilitate their provision. With respect to forests, for example, the suggestion is that forest owners can earn an income by protecting rather than cutting down their forests.

However, this simple and superficially appealing idea is rather less attractive when its real-life implications are considered. For a start, there are profound ethical objections to the idea of monetizing the world's biological resources, and there is also the thorny question of who actually 'owns' those forests and has a supposed right to trade in them. In addition to this, there are also a number of practical problems that make the use of PES schemes highly questionable.

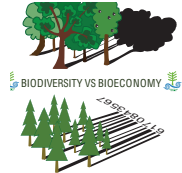
One key problem is that the normal rules of supply and demand that apply to a commercial exchange do not apply in the same way to environmental services. The fact that one person has consumed an environmental service does not mean its availability to others has been reduced. Similarly, once the good or service has been provided, the provider cannot necessarily prevent anyone else from consuming it. Consequently it is notoriously difficult, if not impossible, to put a price tag on or charge consumers for the use and exchange of biodiversity and ecosystem services.

In addition PES is an unnecessarily expensive approach to environmental protection. This is because it is structured to compensate economic actors for the opportunity costs they may forego in terms of other economic activities such as logging or agriculture. In fact, it is highly remarkable that PES is even seen as an innovative financing mechanism, since it does not really generate funding. Rather, it is an expensive environmental policy option that creates an obligation for governments or

⁶ The myth of King Midas relates that he was granted a wish, and chose that everything he touched should turn to gold. This however, included his food (and family members). In some versions of the myth Midas realizes his mistake and his ability is rescinded. In others he starves to death.

⁷ See CBD Alliance (2012) for more information and additional references for the information provided in this section.





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other actors to pay for 'services' that were previously provided, or could be provided, for free, and has so far been very expensive for governments to administer.

PES schemes are also complex and difficult for non-commercial actors to access. PES tends to provide more benefits to wealthy landholders than to economically-marginalized groups like women, indigenous peoples and small farmers, who often lack formal title to their land. In addition, these groups often lack the legal and economic skills to engage in 'environmental services' markets, which implies that they will become more dependent upon conservation groups and other intermediaries, something many indigenous peoples' groups have expressed concern about. Most market-based mechanisms require significant upfront investments in terms of elaborating contracts, and managing and monitoring projects. On the whole this excludes participation by the poorest sectors of society.

Another overall concern with PES is that it is based on a rather simplistic analysis of incentives for conservation, in which financial incentives are considered the main incentive driving the decisions of businesses and individuals. However, in reality social, cultural and educational incentives play at least as big a role in motivating people to conserve biodiversity as economic incentives, and there is even a risk that some PES schemes undermine these other incentives (GFC-CEESP, 2009; GFC, 2010a).

In general PES schemes can have social and cultural implications, especially because of the very significant changes that may be triggered both within and between communities when previously free and communally-shared resources acquire financial value. PES and other market-based mechanisms also tend to restrict land uses essential for the customary bio-cultural livelihoods of traditional communities, leading to an erosion of traditional knowledge and triggering rural-urban migration, especially amongst the young.

As with other market mechanisms the design and implementation of PES schemes is also particularly susceptible to political maneuvering and corruption. Theorists tend to overlook the fact that large landowners and influential politicians tend to belong to the same societal class, and there is often a *"gap between private interests of politicians and collective interests of the nation"* (Karsenty, 2008). Designing cost-effective PES schemes targeted to provide income to poor and marginalized communities would well be challenged by powerful landowners threatening to destroy their forests if they are not granted the same rewards (Karsenty, 2008). As a result, PES schemes in countries like Paraguay are often designed in a manner that benefits large landowners most (GFC, 2008).

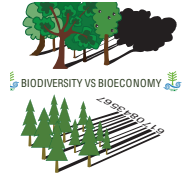
REDD+ and carbon markets⁸

REDD+ (Reducing Emissions from Deforestation and Forest Degradation and enhancing forest carbon stocks) is a global results-based PES scheme being discussed within the UN Framework Convention on Climate Change, with a view to reducing global CO₂ emissions by rewarding governments and/or individuals for not cutting down or degrading forests. The prevailing viewpoint amongst many governments is that REDD+ should be funded by trading forest carbon credits generated by REDD projects on carbon markets.

But, like other PES schemes, REDD+ has serious social and ecological implications, including the potential to undermine the rights of indigenous peoples and local communities and their access to natural resources. This is especially so because REDD+ includes the industrial forest sector,

⁸ See CBD Alliance (2012) for more information and additional references for the information provided in this section.





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allowing continued logging (so long as certain criteria are adhered to) and potentially financing the expansion of industrial plantation agriculture (also a threat to natural forests).⁹

REDD+ is also an expensive, complex and risky process, making it extremely difficult and financially risky for indigenous peoples and local communities to engage. In addition, there are significant methodological problems when it comes to accurately measuring and converting forests' carbon sequestration capacities into verifiable tradable units. These include the problem of 'leakage', when the protection of forest in one area, without a concomitant reduction in demand, results in deforestation simply taking place somewhere else instead. There are also problems associated with projects that would have happened anyway being subsidized, and extreme difficulties associated with monitoring and verification (GFC, 2011).

Nevertheless, land-based carbon sequestration – including by forests and farmlands - is considered by some to be the environmental service that could be most profitable for investors (Richards & Jenkins, 2007), and cheapest for those seeking to 'offset' their pollution elsewhere. This could be mistaken though. Estimated revenue flows are calculated on the basis of the number of carbon credits that could be generated and their opportunity costs, not on whether there will actually be a significant demand for such credits.

But demand for forest carbon offsets can only be created with a combination of ambitious legally binding emission cuts and the possibility of offsetting such cuts with cheap credits from forest-based projects. The outcomes of the 17th Conference of the Parties to the Framework Convention on Climate Change (UNFCCC) in December 2011 make it clear that those legally binding emission cuts, and/or an international obligation for the beneficiaries of carbon-related environmental services to pay, will probably not exist before 2020 at the earliest (and even that is uncertain). Similarly it seems unlikely that REDD credits will be in demand in Europe, since the EU does not allow forest carbon or any other land-based offsets in its internal Emissions Trading System (ETS) - by far the largest operational carbon market - until at least 2020, or later (EC, 2008).

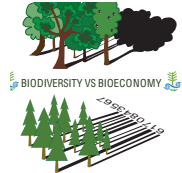
In any case it is clear that climate financing has so far proven to be a highly volatile, unstable and uncertain source of funding that is dependent on the outcomes of one of the most difficult and frustrating international negotiation processes ever undertaken. Carbon markets are currently in freefall – despite high levels of trading, the price of carbon dropped 20% in the first quarter of 2012, compared with the last quarter of 2011 (Business Green, 2012). Key carbon trading mechanisms such as the Clean Development Mechanisms also went into decline over the course of 2011 “suffering from the lack of post-2012 regulatory clarity” (World Bank, 2011:9). The ongoing volatility of carbon markets, in combination with the current instability of the global economy in general, demonstrate that market-based mechanisms are not suitable for the protection of forests, farms, biodiversity or ecosystem services.



Indigenous People's demonstrate against REDD+ schemes during UNFCCC's COP17 in Durban, South Africa.

⁹ This is in part due to the definition of forests that is in common usage within the UN, which allows monocultures of palm oil, for example, to be classified as forest.





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The 'ecosystem economy' will keep profits flowing from South to North

"Because the bio-economy approach seeks to leverage private finance it is almost a given that chosen mechanisms will generate profits that flow back to wealthy investors, primarily in industrialized countries. This explains why these ideas emanate predominantly from a few developed countries and politically powerful corporations. For example, the recent 'Livelihoods Fund', which emerged out of a partnership between major multinational company Danone, the Ramsar Convention, and IUCN, purports to support livelihood and ecosystem based carbon offsets with €30-50 million of 'patient capital' invested over a 10-year period. The fund is already creating carbon offsets through mangrove restoration. While the fund claims to support local communities and peoples through job creation, it is important to note that the Livelihoods Fund has returns of over 11% Internal Rate of Return, which flows back to the investors, European companies - current investors are Danone, Schnieder-Electric, CDC Climat (a subsidiary of Casse de Depots), and Credit Agricole Group. An 11% return is not small change, and represents the way that the flow of benefits and profits flow in the 'ecosystem economy' of the future, once again from South to North." Source: CBD Alliance (2012)

Biodiversity Offsets

Biodiversity offset schemes are similar to carbon offsets, but designed to offset the destruction of biodiversity rather than emissions of greenhouse gases. An offset implies that a certain biodiversity conservation initiative can serve as compensation for a project or policy that destroys biodiversity somewhere else.

In general, biodiversity markets are likely to suffer from the same issues that plague other markets they aim to replicate, such as the carbon market, and are already facing problems with crime, corruption, institutional malfeasance and incompetence, compounded by a lack of regulatory oversight and lack of acceptability across and within countries (FPP, 2011). Given these bad experiences,¹⁰ it is remarkable that proposals have even been developed for a Green Development Mechanism (intended to play the role of an international broker of biodiversity offset agreements similar to the Kyoto Protocol's Clean Development Mechanism).

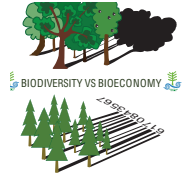
The issue is further complicated in the case of ecosystems and biodiversity markets because these are site-specific, and because of the always-present land use and property conflicts. There are very real concerns that biodiversity offset projects will exclude indigenous peoples and local communities or take the form of new or extended Protected Areas with restricted access for those who have been there and acted as stewards for centuries, even though they have been identified as the most efficient users and conservationists of biodiversity and ecosystems.

Practically speaking the most obvious flaw with biodiversity offsets is that it is most unlikely that two separate sites are likely to be equivalent in terms of their biodiversity, and that the damage done to one site can simply be compensated for by protecting another. They may have entirely different species and ecosystems, and provide different ecosystem functions. Even from an economist's point of view this necessarily restricts the geographic scale of the market, meaning that it also loses *"much or all the ...efficiency advantage competitive markets have over alternative resource allocation strategies."* (Kroeger & Casey, 2007)

Offsets, for biodiversity, greenhouse gas emissions, or any other purpose, are at best a 'zero sum' option, providing no net improvement in biodiversity conservation or emissions reductions: at best, they may compensate for damage done elsewhere. Worse still, the very existence of a biodiversity

¹⁰ There are numerous studies and cases that demonstrate problems associated with carbon credits and offset mechanisms, eg see CDM Watch, www.cdm-watch.org





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offset mechanism can permit destructive projects to be given the go ahead, when they would otherwise have been prohibited. In other words the offset mechanism can work as an incentive *encouraging* biodiversity destruction rather discouraging it. There is little evidence that offset programs work, even in established offset and mitigation programs such as US wetland banking.

In short, this Midas-like move, aimed at converting living systems into potentially highly profitable tradable products, is an extremely high-risk strategy, likely to be of benefit to wealthy investors, providing them with access to resources, profits and opportunities to continue harmful activities. But they entail many negative impacts for those with less financial power, and for the environment. Increasing the monetary value of forests or farmlands will attract investors and speculators of all kinds, in turn increasing the risk of violent landgrabbing. Other compelling arguments against the 'financialization of life' are that it:

- effectively involves converting the world's ecosystem services into privately-owned tradable commodities, which is simply inconceivable within many cultures and communities, who consider the term 'environmental services' a dangerous simplification of the holistic, mutually beneficial and bio-culturally determined relationship communities and individual human beings foster with the environment.
- places those newly-formed assets in the hands of wealthy economic agents that are primarily concerned with generating profit margins (and who have the means to purchase those assets and/or may already own the land, biodiversity or water resources in question). These are the very agents that are currently driving the current crises.
- relies on commercial systems and processes that are already known to be highly volatile and vulnerable to fraud, a risk that is heightened by the intangible nature of ecosystem services especially.¹¹
- fails to address issues of inter- and intra-national inequity in any way other than the most simplistic (increasing employment) meaning that the potential costs of the financialization of life - especially in terms of lost land, increased hunger and financial risks - are likely to be borne by poorer and more vulnerable communities around the world.
- is not necessary. There is compelling evidence to show that community-based forest management and continued traditional management by indigenous peoples is a far more cost-effective and successful approach to conserving forests (GFC, 2010a)

Conclusions

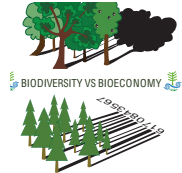
The Earth's ecosystems provide a very limited source of biomass, which cannot be endlessly exploited as a resource base for unlimited economic growth. Moreover, there are fundamental ethical and cultural concerns over the commodification and privatization of biodiversity through markets in environmental products and services.

The problem, as ever, is that while the bio-economy rhetoric sounds seductively green and progressive, the reality is anything but. This is because the bio-economy:

- ignores the lessons to be learned from experiences with biofuels and proposes reliance on biomass as a source of fuel and raw materials, which will inevitably place an extremely heavy toll on food security, and further escalate forest and biodiversity destruction, land grabbing, and

¹¹ As has already been seen to be the case with carbon markets and the Clean Development Mechanism, for example. See (Gilbertson & Reyes, 2009).





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climate change;

- encourages a headlong rush into untried and untested new technologies, and provides a new mandate for risky, under-regulated and unpopular biotechnologies including genetic manipulation (including GE trees), nanotechnology and synthetic biology.
- is intended to maintain production and consumption levels, and fails to recognize or attempt to address the extravagant levels of consumption that exist in some areas of the world, while others cope with extreme poverty elsewhere.
- appears to ignore and even backtrack on previously agreed principles and decisions relating to, for example, people's right to food and water, the rights of indigenous peoples to their territories, and the legal responsibilities that industrialized countries have for resolving the crises they have created.¹²

It is simply not possible to meet a significant proportion of global energy needs from biomass without creating further environmental and humanitarian disasters. The stark reality of the biomass-based economy is that it would require a massive increase in the amount of land required - an untenable development, yet one that is already underway.

Furthermore the bio-economy approach is in stark contrast to the green economy's supposed goal of protecting biodiversity, as set out with respect to plans to develop and establish new environmental services markets. These proposals also take the 'commodification of life' to a new level. Should they come to fruition, every living thing and process could be potential fodder for this new mega-industry, especially if new technologies come into play, and industries currently outside the 'life' sector come looking for new fuel sources, new technologies and new profit-generating opportunities.

We face multiple crises – including an extreme decline of biodiversity, dwindling water and soil resources, deforestation, the escalating impacts of climate change, the increasingly inequitable distribution of resources and wealth, economic instability and escalating hunger. How we respond to these converging crises will determine much for the future of our planet.

Thus far, we have seen proposals to vastly increase demands on ecosystems to provide biomass as a substitute source of energy and materials, and proposals to commodify and market nature. These approaches promote corporate and financial interests that are very different from the interests of the vast majority of humanity. They also conflict with the need to protect the earth's natural systems for future generations.

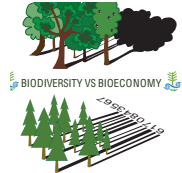
It is time to denounce these false approaches and to embrace a new paradigm: one in which making profits for a few is not held paramount, but rather human rights and the rights of nature are recognized and protected. Instead of promoting a socially-blind 'green economy' there should be recognition of the bio-cultural approaches of indigenous peoples and local communities, who have succeeded in developing sustainable livelihoods, a '*buen vivir*' in harmony with the ecosystems they live in.

Territories and areas conserved by indigenous peoples and local communities, women-driven forest conservation and restoration initiatives, community initiatives that sustain food and energy sovereignty, and the efforts of small peasants to produce food in harmony with our planet all form inspiring examples of ways in which local economies build on the principles of care, harmony with nature, human rights and sovereignty and can contribute to the well-being not only of those people themselves, but of the planet as a whole.

¹² For links to a range of human rights and environmental treaties go to:

<http://globalforestcoalition.org/resources/market-based-conservation/life-commerce-toolkit/knowning-rights>





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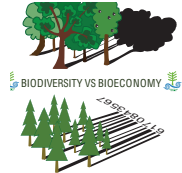
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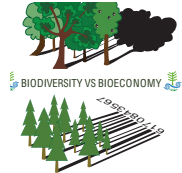
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