

McREDD: How McKinsey ‘cost-curves’ are distorting REDD

By Nathaniel Dyer and Simon Counsell

*“Call a thing immoral or ugly, soul-destroying or a degradation of man [but] as long as you have not shown it to be ‘uneconomic’ you have not really questioned its right to exist, grow and prosper.”
E.F. Schumacher¹*

Key messages

- The carbon mitigation cost-curve, as used by McKinsey & Company, has become influential in national and international REDD policy making, but it is **misleading for decision-makers**.
- The approach is **methodologically flawed** as it excludes transaction and implementation costs, as well as the challenges of governance, and undervalues activities not integrated into formal markets, such as subsistence farming.
- The approach is **flawed as a policy-making tool** as it does not consider alternative policy options, and favours policy that would allow industrial uses of the forest to continue business-as-usual, whilst penalising subsistence activities. This is distorting national REDD plans.
- The use of the ‘top-down’ cost-curve approach has contributed to exclusive and opaque national REDD processes. These processes should be participatory, bottom-up and respectful of the rights of local communities and indigenous peoples in particular.

1. What is the cost-curve and why is it important?

The carbon mitigation cost-curve is arguably one of the most well-known diagrams in climate change policy discussions. It is a visual representation which shows the size of opportunities for reductions in GHG emissions for different activities in order of cost (see Figure 1). The x-axis shows

the abatement potential (how much CO₂ could be avoided by any one activity) and y-axis shows the cost per tonne of CO₂ equivalent (tCO₂e) reduced. Although used by several organisations, it is most associated with the consulting firm McKinsey & Company (McKinsey).²

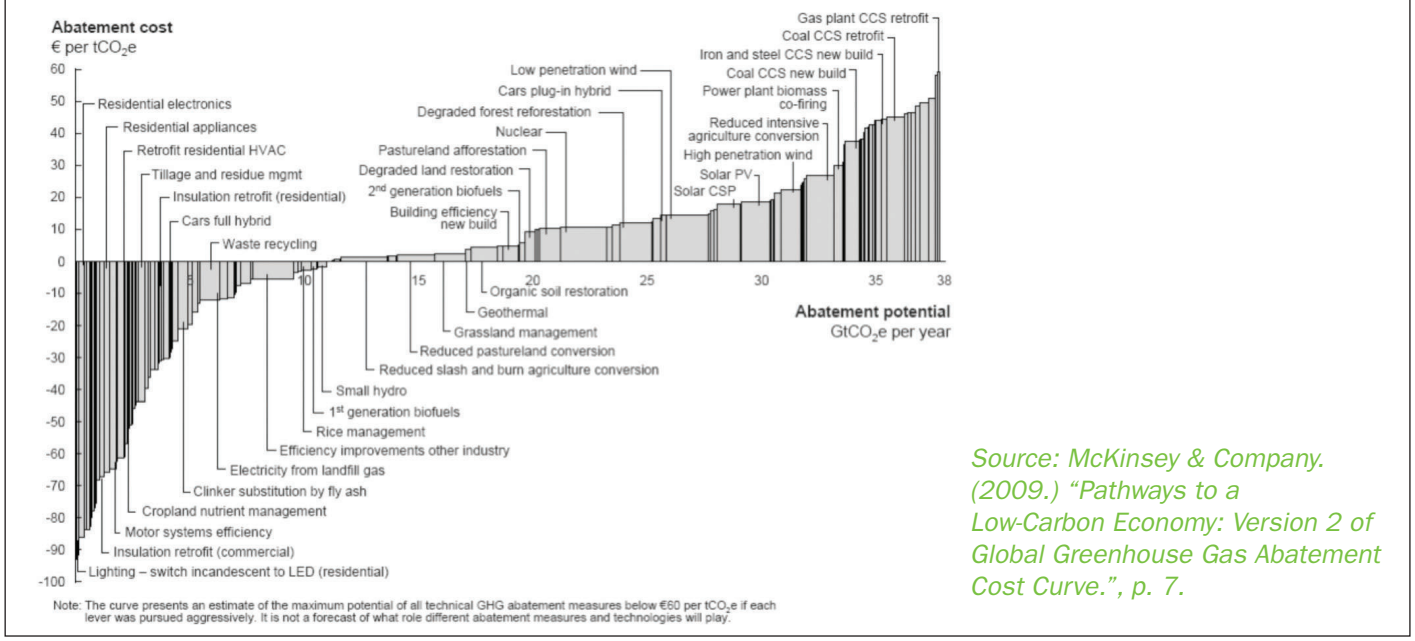
The cost-curve has been used by McKinsey in a number of reports commissioned by national governments and international institutions on how to respond to climate change, including many related to reducing emissions from deforestation and forest degradation in developing countries (REDD). McKinsey have produced national reports related to REDD for the governments of Brazil, Guyana, Democratic Republic of Congo (DRC), Indonesia and Papua New Guinea, amongst others. The cost-curve provided cost estimates for the influential report of the Informal Working Group on Interim Finance for REDD (IWG-IFR) in 2009.³

At the international level, the use of the cost-curve has helped to frame the debate over ‘cheap’

Box 1: Background to REDD

Deforestation and forest degradation are estimated to contribute between 12% and 18% of greenhouse gas (GHG) emissions which cause anthropogenic climate change. Parties to the UNFCCC agreed in Bali in December 2007 to explore policies and financial incentives that would reduce emissions from deforestation and forest degradation (REDD). Around 40 national governments are in the process of creating national REDD strategies, in collaboration with the World Bank’s Forest Carbon Partnership Facility (FCPF) and the UN-REDD programme, amongst others. Many other sub-national REDD projects are already operational.

Figure 1: The global McKinsey cost-curve



Source: McKinsey & Company. (2009.) "Pathways to a Low-Carbon Economy: Version 2 of Global Greenhouse Gas Abatement Cost Curve.", p. 7.

reductions of emissions that are theoretically possible from the forest sector, and what actions should be prioritised. At the national level, McKinsey’s analysis has been used to inform national strategies on how countries will implement REDD. For example, significant sections of the 2009 McKinsey study for DRC, including 14 strategic options for REDD, were integrated with virtually no alteration into the country’s REDD Readiness Preparation Plan (RPP) – submitted to, and approved by, the World Bank’s Forest Carbon Partnership Facility (FCPF) in March 2010 – which set out the process by which DRC will become ‘ready’ for REDD.⁴

2. Why the McKinsey cost-curve is methodologically flawed

The cost-curve is methodologically flawed as it does not show the real costs of REDD: it substantially underestimates the cost of reducing emissions from activities such as subsistence agriculture and it often bases calculations of compensation on inflated, unverifiable projections.

Missed opportunities to show the real cost of REDD

The cost-curve purports to give decision-makers a bird’s eye view of carbon mitigation measures from the point of view of cost-effectiveness, but it fails to include large and unavoidable costs into the model. There are at least four types of cost for REDD⁵:

- *Opportunity* costs: that is, the projected financial benefits that a land owner would forego by not deforesting or degrading forests. For example, if a land owner can earn \$10/ha/year from natural forest, and \$50/ha/year from palm oil, the opportunity cost of not converting the land would be \$40/ha/year.
- *Implementation* costs: for carrying out the actions and projects to actually reduce deforestation or forest degradation, including administration costs.
- *Transaction* costs: for identifying REDD programmes, negotiating contracts, and

This briefing will first highlight some of the weaknesses of the cost-curve methodology and then examine its use as a policy-making or influencing tool for REDD before drawing some conclusions and recommendations. We believe that use of the cost-curve could mislead decision-makers as to the choice of the most appropriate strategies for REDD and their likely costs and benefits. It could result in pressure to reduce deforestation and degradation falling disproportionately on local communities and indigenous peoples, endangering their customary land rights and traditional way of life, while allowing large-scale extractive industries to continue ‘business as usual’ or even to benefit from REDD without changing destructive practices. According to the general McKinsey cost-curve above, several of the lowest-cost, highest abatement potential options (those with low, wide columns) are related to forestry, including ‘reduced slash and burn agriculture’, ‘degraded land restoration’ and ‘reduced pastureland conversion’.

monitoring, reporting and verifying (MRV) emissions reductions and social and environmental benefits. These are costs that do not directly lead to reductions in emissions.

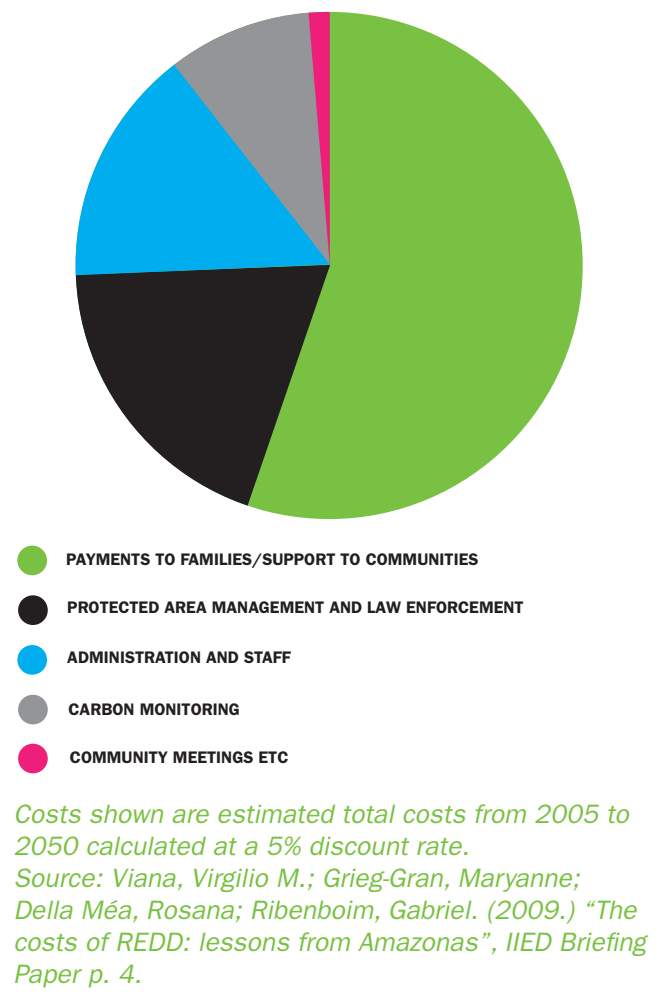
- *Institutional costs*: support for legislative and institutional reforms and capacity-building needed to create an enabling environment for REDD. These will be higher in countries with poor forest governance and could include costs related to social welfare and biodiversity protection.

As a general rule, cost-curves for REDD only include opportunity costs. *Indonesia's greenhouse gas abatement cost curve* (2010) published by Indonesia's National Climate Change Council (DNPI) and based on McKinsey analysis says: "The cost of each opportunity also excludes transaction and program costs to implement the opportunity on a large scale... [and] will in most cases be higher than those shown in the cost curve." Similarly, the cost-curve report McKinsey produced on behalf of the DRC's *Ministère de l'Environnement, de la Conservation de la Nature et du Tourisme* (MECNT) in 2009, says it "does not include the collection of transaction costs, communication or information costs, subsidies or 'carbon' costs, or the consequent impacts on the economy".⁶

The opportunity cost approach, which underpins the cost-curve, is based on the theory that if the land owner is compensated for the monetary value which is forgone by not cutting down the forest, they will choose to keep it standing. However, not all REDD activities will be so simple in reality. REDD activities in particularly large countries – especially those with weak governance – and REDD actions targeting disparate and marginalised groups will entail very substantial transaction, implementation and institutional costs. It should also be noted that in order to ensure that the emissions reductions of a REDD project are *permanent*, implementation and transaction costs may well have to continue for many years after the active life of the project has been completed.

To take an example from Brazil, the Juma Reserve in Amazonas State estimates that payments to families and support for communities (which may already be more than the basic opportunity cost) will account for just over 55% of costs. The remaining 45% of costs will be for other activities such as improving forest law enforcement and governance, administration, monitoring carbon and preparatory meetings with

Figure 2: Costs of the Juma Reserve in Amazonas State, Brazil



communities (see Figure 2). It is likely that in other REDD projects, implementation and transaction costs could be significantly higher.

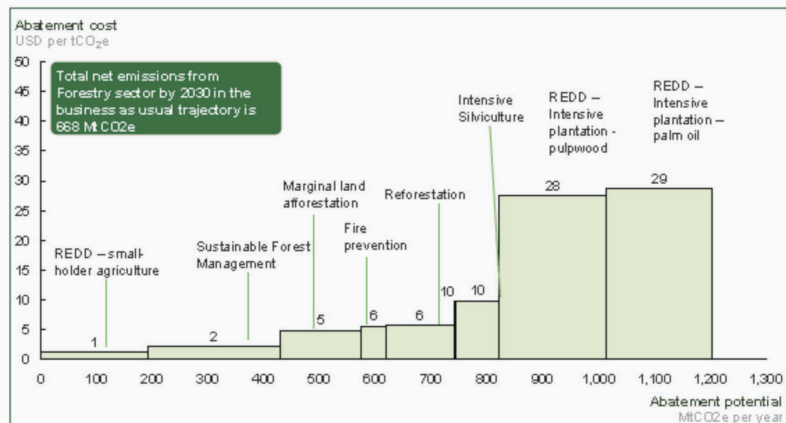
Despite the caveats, often in footnotes, stating that the cost-curve only shows some of the costs of REDD, this has not been built into the cost-curve model or the headline numbers. A recent report by Rights and Resources Initiative and CIRAD (Agricultural Research for Development) concluded that opportunity cost is "just the tip of the iceberg when it comes to estimating the real compensation that will have to flow into tropical developing countries to implement effective, efficient and fair REDD+ programs."⁷

When these hidden costs are incorporated into the cost-curve, it would significantly change the heights of the various columns. Decision-makers relying on the cost-curve to give them an accurate basis for comparison between different options should therefore tread very carefully.

Figure 3: REDD cost-curve for Indonesia

1,200 MtCO₂e could be abated in 2030 by implementation of 9 different abatement levers

Societal perspective, 2030



Note: The curve presents an estimate of the maximum potential of all technical abatement measures below EUR 60 per tCO₂e if each lever was pursued aggressively. It is not a forecast for what role different abatement measures and technologies will play. Assuming a 4% societal discount rate.
SOURCE: Indonesia B GHG Abatement Cost Curve

Source: Indonesia's National Climate Change Council (DNPI). (2010.) "Indonesia's greenhouse gas abatement cost curve". August 2010, p. 21.

Do the cheapest reductions come from the poorest forest users?

The cost-curve as it stands is particularly poorly suited to showing the real costs of reducing deforestation and degradation caused by subsistence activities that are not part of the market economy. McKinsey claims that large amounts of emissions – 2 gigatonnes (Gt) of CO₂e – could be reduced globally from “slash and burn agriculture conversion” at a cost of less than €2 per tCO₂e: this, they point out, is “very inexpensive” in comparison to other mitigation options.⁸

Similar claims have been made in national cost-curve reports on REDD. For example:

- The McKinsey-inspired ‘Indonesian National Climate Change Council’ report estimates that “stopping forest conversion to smallholder agriculture is the single largest opportunity at slightly more than 190 MtCO₂e” and can be achieved at US \$1 per tCO₂e.⁹ (see Figure 3).
- The McKinsey report for DRC suggests a higher, but still relatively inexpensive, cost of €4.80 to €6.50 per tCO₂e for reducing deforestation from subsistence agriculture.¹⁰

These emissions reductions have been called the ‘low-hanging fruit’ in the fight against climate change,¹¹ but why are they so cheap? Like much of McKinsey’s cost-curve work, the calculations behind the headline numbers are not given (see Box 2). As shown above, the headline cost only takes

into account opportunity cost, or the economic value that derives from deforesting or degrading the land. This is particularly problematic with regard to small-scale agriculture, as by definition much of it is primarily farmed for subsistence purposes and is not sold on the market. Subsistence uses do not generally yield a quantifiable economic value, and are therefore not captured in the cost-curve. Even when small-holder produce is sold at market, the net economic value of one hectare of manioc or cassava, for example, is negligible. This is a clear illustration of how the cost-curve tends to recommend that action is taken where the least economic value is drawn from the forest, or in other words, in areas controlled by poorer forest users. This logic could lead to perpetuating the poverty of the poorest farmers – as it does nothing to improve poor people’s position, merely advocating that one source of a poverty-level income is replaced by another.

The difference between theoretical opportunity costs and real activity costs is particularly large in relation to slash-and-burn farming. As an example, if the cost of reducing slash-and-burn farming is estimated at US \$1 per tCO₂e (similar to above), this would imply that a typical family – with a holding of one hectare of forest containing around 200 tonnes carbon per hectare – could be prevented from clearing forest through compensation of approximately US \$720.¹²

This figure of US \$720 per family is likely to be a massive underestimation once the costs of mechanisms to support alternative livelihoods, relocation (if this is necessary and consented to), and replacement of other services previously

Box 2: McKinsey's Black Box

The term 'black box' describes any process or system whose inner workings are unknown, or not transparent, and therefore does not provide a satisfactory explanation of the outputs. Specific references for cost estimates, or calculations to show how the headline figures were estimated, are rarely given in McKinsey's cost-curves, as is shown by examples from Indonesia and DRC below.³⁷

Logging, natural forest and fires in Indonesia

The McKinsey-inspired Indonesia report claims that sustainable forest management (SFM) and reduced impact logging could save 200 MtCO₂e, at a cost of slightly more than US \$2 per tCO₂e abated. It goes on to say that: "The alternative [to SFM] – stopping logging altogether – would have the same effect on emission reduction, but has a much higher opportunity cost".³⁸ No reference or justification is given to support this claim, and it goes against both common sense – how could no logging produce the same amount of emissions as continuing logging? – and scientific research.³⁹ Reduced impact logging has been shown to reduce carbon content of natural forest by almost 40%, most of which ends up in the atmosphere.⁴⁰ In addition, a genuine comparison of policy options would need to consider the longer term impacts of logging, including the construction of roads that increase access to the forest. Studies have shown that previously logged forests are "up to eight times more likely to be deforested and converted to agricultural land" than undisturbed forests.⁴¹

The Indonesia report also includes 'prevention of forest fire' as a separate policy option which could save 43 MtCO₂e in 2030 at a cost of US \$2 per tCO₂e.⁴² Again no external reference is given for these figures. There is also a lack of analysis about the interconnection of different policy levers. Natural rainforests are largely immune from fire, whereas logged forests are far more vulnerable. An article in Nature showed that during El Niño fires in late 1990s, 60% of logged forests in Indonesian Borneo burned, compared to just 6% of primary forest.⁴³

Illegal logging in DRC

The McKinsey report for the DRC states that 5% of the country's total reductions in GHG emissions could come from reductions in illegal logging, or 22 to 23 Mt CCO₂e.⁴⁴ Again, no references or calculations are provided to support this number. Such a high level of precision is surprising, given that no-one has a precise idea of the volume of wood cut illegally in the DRC, let alone the resulting carbon emissions.⁴⁵

Unless full references and calculations can be provided, and light shone into McKinsey's black box, these numbers should not be used to inform national REDD programmes.

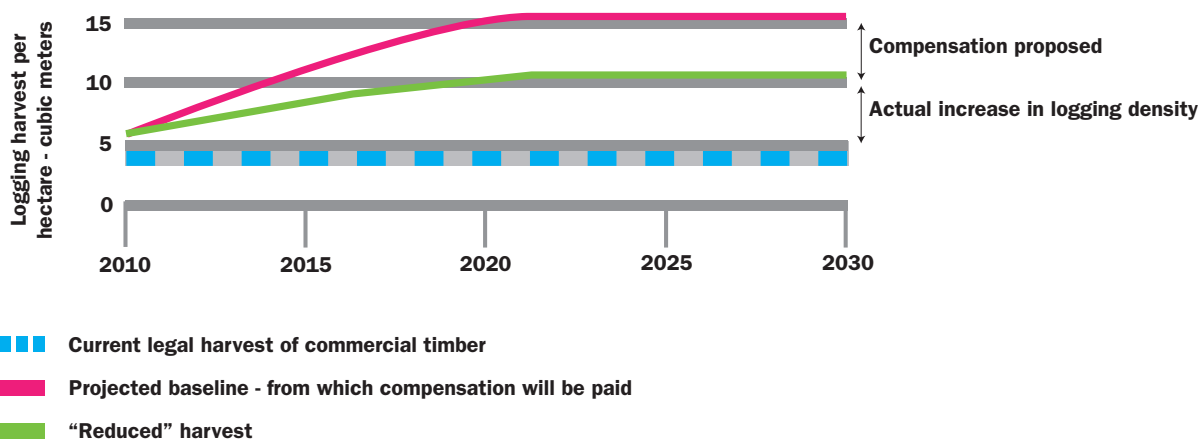
supplied by the forest is included.¹³ Any such scheme would have to deal with the challenges of operating over enormous areas with, globally, hundreds of millions of smallholders. Giving forest dwellers or farmers money equivalent to the market values of those outputs "wouldn't help them much".¹⁴ Significant upfront investments would be needed in 'readiness' actions related to governance and monitoring systems. There would be significant risks of human rights violations, entrenching poverty, and marginalisation of local communities and indigenous peoples in the absence of this.

Years of development experience shows that the implementation costs of a REDD programme to fairly and equitably reduce slash-and-burn would be much higher than the cost-curve estimates, as would the transaction costs of setting up a payments scheme, monitoring results, and national systems to ensure compliance. A fair and equitable scheme would need to show from where forest-dwellers will be able to access food, fuel and materials for housing that are currently obtained from the forest, and ensure that compensation was at least adequate to purchase replacements. These alternative materials and foodstuffs, especially if they are imported or grown intensively, would themselves have a substantial carbon footprint which is not included in the cost-curve model. More research is needed into the marginal carbon benefit of stopping small-scale slash-and-burn farming, which could be low or even negative. It should also be noted that in many remote areas there are large 'missing markets' in key districts, which would leave subsistence farmers unable to easily switch to marketed goods due to lack of access to food and other vendors. Under these circumstances, cessation of subsistence farming could cause food price inflation, food shortages and possibly mass demographic relocation. There are probably many hundreds of millions of people worldwide depending on subsistence farming in forest areas for their survival.

Furthermore, the cost curves do not distinguish between genuinely destructive slash-and-burn farming (often for commercial purposes), and traditional and broadly sustainable rotational forest farming, or swidden agriculture which is intimately linked to the way of life of many forest communities. Traditional rotational forest farming – as used in many tropical forest areas – involves the subsequent re-growth of forests, and storage of carbon.¹⁵ The carbon emissions caused by this farming, over a full rotation of 10-20 years, would therefore be much less than might be indicated from one 'snapshot' in time.

Figure 4: Proposal for increased logging to be compensated by REDD payments in DRC

Future logging scenario according to McKinsey report for DRC



In reality, picking off the apparently ‘low-hanging fruit’ may be more risky, difficult and costly than the simplistic modelling of the cost-curve suggests.

Looking through a crystal ball: inflated baselines

There is not enough space here to deal adequately with the technical and ambiguous subject of baselines, or deforestation and degradation reference levels; this has been done elsewhere by Dr Alain Karsenty. He has shown that creating accurate models to predict future deforestation is particularly difficult, as is proving that payments lead to *additional* reductions.¹⁶

Whilst there are valid arguments about how to ensure that global schemes to reduce deforestation are designed to include as many countries as possible, especially the so-called ‘High Forest Cover, Low Deforestation’ countries, the use of inflated baselines in the McKinsey cost-curves raises a serious ‘moral hazard’ for tropical countries. The first McKinsey report for Guyana presented a deforestation scenario of 4.3% per year – which would result in near total destruction of Guyana’s rainforest in 25 years – and is wildly inflated from the actual rate of deforestation, which is estimated to be between 0.1% and 0.3% per year.¹⁷ The McKinsey scenario suggests that Guyana could earn approximately \$580 million per year by cutting its forest and replacing it with high value agriculture at this inflated pace.¹⁸ Although this is implausible due to poor soil quality, the President of Guyana repeated this figure in international meetings as

the level of funding Guyana would need to prevent deforestation.¹⁹ This, however, is based on an unrealistic, projected baseline and has very little relation to how much effective forest protection would cost in Guyana. Furthermore, there is a danger that these high-deforestation scenarios could become self-fulfilling prophecies and encourage tropical governments to pursue destructive practices in order to increase their expected compensation.

Other more subtle inflated baselines in the McKinsey approach also promote perverse outcomes. The DRC report identifies compensation to logging companies as a potential way to reduce forest-sector emissions. As Gregersen *et al* state, the current volume of legal harvest in the DRC is between three to five cubic metres per hectare. The model used in the McKinsey report assumes that this will increase to 15 cubic metres per hectare by 2030: this, however, is extremely unlikely due to the geography and high operating costs in DRC. It is then proposed, in the model, to compensate logging companies to ‘reduce’ their extraction (against the inflated future baseline) to 10 cubic metres per hectare – in reality, this would be an *increase* of five cubic metres per hectare from the true historical baseline (see Figure 4). A payment would then be made to the companies in order to make the new (increased) volumes “sustainable” for the company.²⁰ Government regulation capping the volume harvested per hectare would be much more cost-effective.²¹

Similarly, the McKinsey report for Guyana discusses rolling back environmental regulations that limit

Box 3: Will REDD be more expensive or less expensive than the cost-curve numbers?

This briefing argues that the cost-curve underestimates the cost for some policy options, which will make reducing deforestation by those means more expensive than the headline figure. It has also argued that large transfers of funds are not necessary for other policy options where reductions could be achieved at a cost less than the headline figure. This appears to be a contradiction.

The explanation for this is linked to the nature of the opportunity cost approach. Cost-curves mentioned in this briefing have included cost estimates that are *both* too high and too low, depending on the policy option. This briefing shows that the real costs of reducing emissions from small-holder agriculture in Indonesia – once more than just opportunity cost is taken into account – will be much more expensive than the figure of US \$1 per tCO₂e. It was also suggested that the option of paying loggers in the DRC or palm oil producers in Indonesia according to opportunity cost is inefficient and significantly more expensive than maintaining or enforcing government regulations. It argues that the policy mix between ‘incentives’, ‘imperatives’ and ‘capacities’ is needed.

This briefing is not calling for increased cost estimates for REDD, but for a broader and more nuanced approach. To risk stating the obvious, deforestation and degradation are not solely caused by economic drivers, but are influenced by the political and social environment. Investments in improving forest governance and regulation, or recognising customary land rights, could mitigate deforestation and forest degradation more effectively and at less cost than paying opportunity costs. Hatcher has estimated that the “cost range of recognizing community tenure rights (\$0.05/ha to \$9.96/ha) is several times lower than the yearly costs estimates for administering, implementing and financing an international REDD scheme (\$400/ha/year to \$20,000/ha/year).”⁴⁸ Less money used more intelligently will result in better outcomes – for forest people and the climate – than more money put to the wrong uses.

extraction of timber to 20 cubic metres per hectare to allow for a “more permissive regulatory regime” that would allow up to 40 cubic metres of timber per hectare to be logged.²² This would then be used to form a new baseline, double what is permitted under current legislation, from which ‘reductions’ would be judged. In both of these examples, it would then be possible for logging companies to *increase* their real volume of extraction of timber and receive REDD payments for apparently *reducing* deforestation and

degradation. Furthermore, national commentators have stated that the higher baseline is unrealistic given the operating conditions of the Guyanese forest sector.²³ (see Box 3 for further discussion).

3. Why the cost-curve is misleading as a policy-making tool

The problems of using the cost-curve as a policy-making tool stem from its methodological weaknesses, but it is worth expanding on this given its important role in national dialogues on REDD in many rainforest nations.

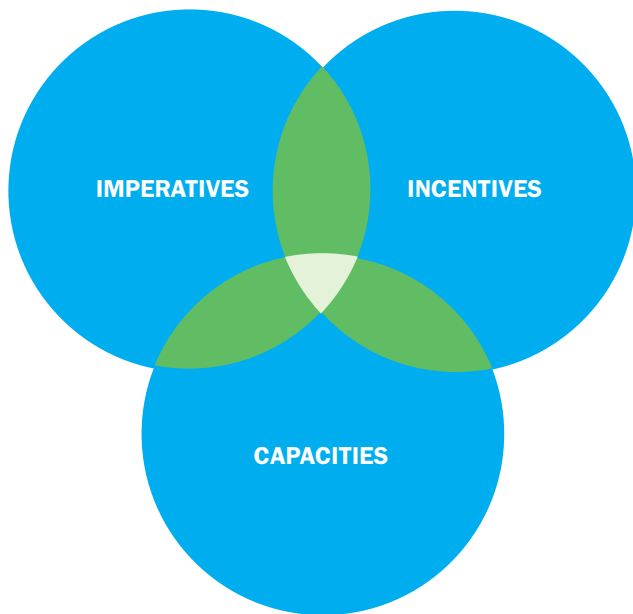
The opportunity cost approach attracted international attention when it was used in the Stern Review of 2007. It has been argued that, despite its methodological flaws, opportunity cost and the cost-curve are useful tools at a high level to get decision-makers to consider the advantages of REDD. Supporters of this view generally concede that the cost-curve should not be used for selecting on-the-ground REDD activities, nor areas of intervention. However, it is now clear that in a number of countries’ cost-curves are not only playing an important part in national policy making, but are also shaping the development of operational REDD programmes.

Simple economics is not the only policy tool in the box

The opportunity cost approach, and the cost-curve, tend to take a ‘one-size-fits all’ approach to avoiding deforestation through incentives or payments to landholders. However, this overlooks the interaction of different policy levers to achieve the goal of reducing deforestation. In order to have a complementary policy mix, one would need to consider ‘imperatives’ (laws and regulations) and ‘capacities’ (the ability to enforce them and provide good forest governance) in addition to simple ‘incentives’ (REDD payments).²⁴ This was acknowledged by the IWG-IFR report: “in some countries significant results could be achieved through improved law enforcement, which could be achieved with relatively low investment, much lower than would be needed for REDD+ to compete with illegal activities”²⁵ It has been broadly accepted, through the three-phased approach for REDD, that a transfer of funds alone will not achieve the intended aims.

A more rigorous and sophisticated model needs to be developed which builds those overlooked costs

Figure 5: The Complementary Policy Mix



Source: The Transition to a Low Carbon Economy, (2010). Professor Andy Gouldson, Director, Centre for Climate Change Economics and Policy, School of Earth and Environment, University of Leeds.

- In the DRC, there has been a long but inconclusive legal review of all 156 of the country's logging titles which, if properly completed, could see illegal logging operations covering an area of around 10 million hectares closed down.
- In Guyana, many aspects of the forestry law could help to significantly reduce forest damage and carbon emissions, but have never been properly implemented.
- In all three countries, increases in the area-based and other forest sector taxes could help both to reduce waste in the sector and also bring in income to the treasury.

Strengthening compliance with this existing law would involve governance costs, but is likely to be substantially cheaper than paying for the opportunity costs. Such alternative approaches could help deal with underlying sectoral problems, instead of pursuing an 'opportunity cost compensation' approach, which would not only fail to deal with the underlying problems but could easily exacerbate them.

Does the cost-curve allocate responsibility and funding for reducing emissions fairly?

It has already been argued that the cost-curve does not give decision-makers access to all the necessary information to make informed policy choices, and fails to provide a complete picture of comparative cost-benefit estimates. REDD policy influenced by the cost-curve could lead to a false set of policy priorities and inequitable outcomes for poorer forest users.

Taking the figures given in the Indonesian cost-curve report in Figure 3, it is estimated that emissions could be reduced from small-holder agriculture at US \$1 per tCO₂e, whereas emissions from intensive plantation palm oil could be reduced at US\$29 per tCO₂e. As has been argued, the difference in these figures is due to much of the output of small-holder agriculture being used for subsistence purposes which do not register an economic yield. If compensation was paid strictly according to these opportunity costs for avoiding deforestation, the outcome would be highly inequitable. Take a REDD project in which subsistence agriculturalists and palm oil plantation owners are each given compensation for not deforesting an area of 50

into the bottom line of REDD activities. The cost-curve takes a narrow economic approach, and hence overlooks the possible reduction of emissions that could be achieved – often at a low cost – through governance and regulatory reforms such as the legal definition of indigenous territories, sound forest governance, and internal regulation of forest taxes and changes to subsidies. As noted above, in their reports for DRC and Guyana, McKinsey have suggested payments for theoretical “reductions” of logging intensity measured against an artificially high, and often implausible, scenario. In both cases, it would be more practical and probably cheaper if the governments passed or enforced legislation against higher levels of timber extraction, but this is not considered by McKinsey.

Other examples of regulations, or 'imperatives' to use the language of the complementary policy mix, which would likely be more practical and cheaper than payments according to 'opportunity cost' are:

- In Indonesian law it is illegal to convert peat swamps more than three metres deep to other land uses²⁶, the practice is believed to be widespread and contributes to Indonesia's carbon emissions.

hectares. If we assume 200 tonnes of carbon per hectare (equivalent to 720 tCO₂), the subsistence agriculturalists would be paid \$36,000, whereas the palm oil plantation owners would be paid more than \$1 million – or nearly thirty times as much – to protect an area of the same size.²⁷ This defies common sense and would turn an established principle of environmental law on its head: the ‘polluter pays’ principle would become the ‘polluter gets paid’ principle. This would be a highly perverse outcome in countries marked by extreme poverty.²⁸ Although McKinsey have said “transfers to forest people or the landless poor might need to exceed opportunity costs substantially”, they do not build this into their model so that decision-makers can compare the true costs and benefits of different options.²⁹

In addition, the logic of the cost-curve is that less expensive options be taken up before others and that some options are too expensive to undertake at all. This could have the result of allowing extractive-industries to continue ‘business-as-usual’, whilst increasing the responsibility of tackling climate change on the rural poor, who have contributed the least to the problem. The McKinsey report for DRC explicitly states that the deforestation from some industrial uses of the forest – such as mining and oil exploitation – should not be tackled as a priority due to the high opportunity cost of these activities.³⁰ Repeatedly, the reports deflect responsibility for reducing deforestation from forest industries and towards forest communities. As has been said, there may be other policy tools, such as regulation, that could reduce deforestation from these activities at a fraction of the opportunity cost.

Of course, if projects designed to support rural populations in reducing their dependence on the forest and gaining alternative livelihoods were implemented in the right way, they could bring benefits. However, if decision-makers see these actions as an inexpensive and easier option, it is likely that they will be implemented in an inappropriate and inequitable way. There are further barriers for local communities and indigenous peoples to benefiting from REDD compensation schemes, such as the near universal lack of clear land title in all the main tropical forest regions, which is particularly marked in Africa, and a frequent lack of existing financial or banking infrastructure that local communities could use to access payments.

There is a real danger that REDD activities inspired by the cost-curve would result in *regressive*

Box 4: Criticism of cost-curve in energy and building sectors

Charles River Associates International, a consulting firm, analysed McKinsey’s reports on carbon in the energy sector in Australia and concluded that the cost-curve framework ignored important costs and risks, is over-simplified, focused on theoretical savings not practical realities and could “guide decision-makers in the wrong direction”.⁴⁶ Similar criticism was levelled at McKinsey’s work on the building sector by the Director of the World Business Council for Sustainable Development’s Energy Efficiency in Buildings project. He wrote that the analysis is overly optimistic about the low-cost carbon mitigation options available, due to not taking into account the interactions between different policy options, nor the complex nature of the sector.⁴⁷

outcomes that penalise poor communities more than wealthy forest users (for example, industrial forestry, palm oil and mining industries). Also, this may lead to greater responsibility for reducing emissions shifting to poorer countries, and to poorer sections of their societies, where the apparent lowest cost mitigation options lie.

Rainforests are more than carbon

The narrow focus of the cost-curve on carbon also poses problems for its use as a policy-making tool. The model equates one tonne of carbon stored in a tree plantation with one tonne of carbon stored in a natural forest, or indeed the carbon emitted from a factory. Whilst this is true in the narrowest chemical sense, it does not bring into the equation the qualitative differences between a plantation and a natural forest. A natural forest provides biodiversity, livelihood and ecosystem benefits and services that a plantation cannot. Carbon storage is only one service that forests provide, and their full value is many times greater.³¹ The issue of *permanence* cannot be ignored, as forest carbon would need to be guaranteed to stay in organic matter for at least a hundred years to offset fossil carbon released as a by-product of industrial processes.

This approach also poses a risk that the carbon stocked in new tree plantation schemes would be offset, as it were, against the destruction of natural forest by extractive industries such as logging or mining. This is, in effect, suggested in the McKinsey report for the DRC, with the proposed creation of a

Box 5: McKinsey's false good news?

The message included in McKinsey's cost-curves is an optimistic one. It says, in general, that through economic and technological fixes, and without major behavioural changes, we can achieve the emissions reductions necessary to mitigate climate change in a cost-effective way. However, this briefing has shown that this optimism might be misplaced, as costs for some of the policy options are vastly underestimated, while other policy options that do not fit in the model are not taken into account.

In the bigger picture, misplacing optimism in cheap fixes for climate change could be very dangerous. To underestimate the costs of emissions reductions means that they are less likely to be achieved with the means provided. This would lead to a slower decarbonisation in energy systems and more risk of locking-in higher levels of warming. If the cheap and easy emissions reductions included in McKinsey's cost-curves are illusory, this could have the effect of holding back more fundamental societal changes necessary to live within our ecological limits.

This also has implications for the wider climate change debate, in terms of setting out the relative merits of forest-related emissions reductions options in comparison to non-forest options. When the full costs of apparently cheap forest options are taken into account, they would be represented in the cost-curve with higher columns, further to the right. This may mean that forest-related options may not be as cost-effective as other non-forest carbon options, such as investing in solar or wind power, which could lead to misguided national carbon reductions programmes.

carbon sink of 145 MtCO₂e through reforestation and afforestation.³² This has the added bonus of being further to the left of the cost-curve, and hence apparently a less expensive mitigation option. The large volume of carbon that would be sequestered in these schemes is the justification by which the proposal to grant 10 million hectares of new logging concession permits in DRC, at the end of the current national moratorium on new logging concessions, and 1.6 million hectares of palm oil concessions, is included in the proposed national REDD strategy.³³ Similarly, the Indonesian report counts a 280 MtCO₂e carbon abatement through the increased carbon absorption of reforested areas, including fast-wood and palm oil plantations. This would indirectly offset emissions from the 11 to 15 million hectares of currently forested land that the government is planning to convert to meet growing international

demand for pulp and palm oil.³⁴ Thus, although the two ends of the argument are never fully joined up in the reports, as a result of increasing plantations, deforestation of natural forest is allowed to continue. It should be noted that this use of plantations is very different from using tree plantations as an alternative source of fuel-wood to natural forest, which may have positive benefits.

Reducing participation

Another impact of the cost-curve reports relates to process. As they have been produced by external consultants, working to tight timelines, this has not allowed a full consultation with relevant stakeholders and rights-holders. The McKinsey report for DRC, for example, was written in a period of five weeks by consultants, in parallel to civil society engagement in the national REDD process.³⁵ The reports have at times also not represented forest sector reforms that may have been on-going for many years. Where consultations have occurred, few NGOs have been involved, and almost no local organisations, let alone forest community representatives themselves. This is perhaps to be expected from this style of top-down economic analysis, but it does pose a problem when these reports influence, or are copy-pasted into, national RPPs, which are supposed to be owned by all stakeholders in the country. The secrecy of many McKinsey reports has made participation and transparency more difficult.

4. Conclusions

Reducing the rate of deforestation and forest degradation should be done in an equitable and fair manner that respects the rights of local communities and indigenous peoples. The key message of this briefing is not that reducing deforestation is too difficult, but that we cannot get to the desired outcome with overly simplistic analysis or policy that is not based on good evidence.

REDD was proposed as a mechanism to correct the current market failure to internalise costs, such as the degradation of ecosystems and their services, that are currently not included in the bottom line. It was based on the argument that we need a new economic model to account for these externalities and to put our economies on a sustainable path. It is, therefore, ironic that the McKinsey cost-curve, with its hidden costs and partial analysis, has become so prominent in national and international REDD processes, as it is similar to the narrow economic approach that contributed to the problem

that we are now attempting to solve. This briefing has highlighted methodological and practical problems with the use of the McKinsey cost-curve in REDD. It has shown that the approach is overly simplistic, does not include many of the real costs of potential REDD activities (particularly subsistence agriculture), and may misrepresent the value of policy options and therefore promote an unfair and unjust distribution of responsibilities and funding for reducing deforestation. These cost-curves are distorting policy on reducing deforestation and degradation by focusing narrowly on carbon storage rather than other services provided by forests, and by proposing narrow economic solutions to inherently political and multi-dimensional problems. It has been shown that cost-curve reports have often included highly inflated baselines and have reduced the participation of a wide range of stakeholders and rights-holders in national REDD debates.

The McKinsey reports are not without merit and, despite the problems highlighted here, do include some useful suggestions for reducing deforestation and degradation. They particularly appeal to busy decision-makers who value the visual punch of their graphs and sense of certainty implied by their hard numbers. However, as has been shown, the accuracy of these numbers is shaky, and supporting evidence is not given to allow fully-informed decision-making.

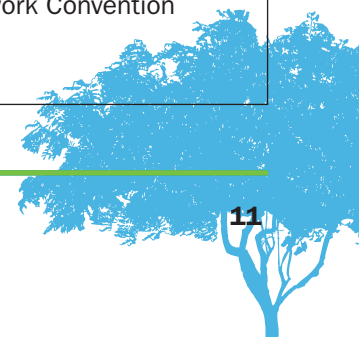
It is clear that reducing deforestation and degradation is more difficult than many people thought a few years ago. To use a metaphor, the recipe for success requires many different ingredients, which must be added at the right time and in the right quantities; some are essential

from the beginning and others can be added at the end. Timing is important and great care must be taken to create the finished product. Compared to this description of the ideal recipe for reducing deforestation, the one proposed by McKinsey is the fast-food alternative; it could be called 'McREDD'. McREDD looks great and promises many things, but it is produced quickly, from ready-made ingredients, and could seriously damage health. In the end, junk economics could be more damaging to the world's rainforests than junk food.

Recommendations

- The McKinsey cost-curve in its current form should not be used to inform national or international REDD strategies or programmes, as it is both methodologically flawed and does not give an accurate representation of the real costs and opportunities of different options.
- The full cost – including transaction and implementation costs, and costs of necessary legislative and institutional reform and consultation – should be included into REDD programme design.³⁶
- National plans for reducing deforestation should be created in a collaborative, bottom-up approach, which recognises the rights of local communities and indigenous peoples.
- More research is needed on the real costs of reducing deforestation from subsistence agriculture, rotational farming and other policy options.

Acronyms	
DRC	Democratic Republic of Congo
FCPF	Forest Carbon Partnership Facility, World Bank
GHG	Greenhouse gases
ha	hectares
Gt	gigatonne, equal to one billion (1,000,000,000) metric tonnes
IWG-IFR	Informal Working Group on Interim Finance for REDD
Mt	megatonne, equal to one million (1,000,000) metric tonnes
REDD	Reducing emissions from deforestation and forest degradation
RPP	REDD Readiness Preparation Plan
SFM	Sustainable forest management
tCO_{2e}	metric tonne of carbon dioxide equivalent (including all 6 GHG emissions)
UNFCCC	United Nations Framework Convention on Climate Change



Footnotes:

- 1 Schumacher, EF. (1973.) Small is Beautiful: A study of economics as if people mattered, p. 34.
- 2 McKinsey & Company. (2009.) "Pathways to a Low-Carbon Economy: Version 2 of Global Greenhouse Gas Abatement Cost Curve." Available at: http://www.mckinsey.com/clientservice/ccsi/pathways_low_carbon_economy.asp
- 3 All these reports are based on the cost-curve set out in McKinsey & Company. (2009.)
- 4 MECNT (Ministère de l'Environnement, de la Conservation de la Nature et du Tourisme). (2009.) "Potentiel REDD+ de la RDC". Kinshasa, DRC: December 2009 & MECNT (2010.) Readiness Plan for REDD R-PP Final Version (v.3.1), Democratic Republic of Congo, July 15th, 2010. Available at: <http://www.forestcarbonpartnership.org/fcp/node/65>
- 5 For more of a discussion of costs see: Pagiola, Stefano and Bosquet, Benoît. (2009.) "Estimating the Costs of REDD at the Country Level". Forest Carbon Partnership Facility, Version 2.2, 22 September. Available at: <http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/REDD-Costs-22.pdf>; and Boucher, Doug. (2008.) Estimating the Cost and Potential of Reducing Emissions from Deforestation (Briefing No. 1). Union of Concerned Scientists (UCS).
- 6 MECNT (2009.), p. 52.
- 7 Gregersen, Hans; El Lakany, Hosny; Karsenty, Alain; White, Andy. "Does the Opportunity Cost Approach Indicate the Real Cost of REDD+?" (2010.) Washington, DC: Rights and Resources Initiative.
- 8 McKinsey & Company. (2009.), p. 120.
- 9 Indonesia's National Climate Change Council (DNPI). (2010.) "Indonesia's green house gas abatement cost curve". August 2010, pp. 20-21. Available at: http://www.dnpi.go.id/report/DNPI-Media-Kit/reports/indonesia_ghg_abatement_cost_curve/Indonesia_ghg_cost_curve_english.pdf
- 10 MECNT (2009.), pp. 3-4.
- 11 See for example: REDD-Monitor. (2010.) "We must take advantage of low-hanging fruit solutions such as forest conservation": Interview with Jeff Horowitz", Chris Lang, 19th February 2010
- 12 200t carbon is equal to approximately 720t CO₂. Therefore, the opportunity cost abating 200t of carbon at US \$1/ tCO₂e is approximately US\$ 720. which means that 200t C in an hectare of forest would convert to \$1 x 200t x 3.6 = \$720 /ha.
- 13 For a fuller treatment see Gregersen et al (2010.), p. 12.
- 14 Gregersen et al (2010.), p. 12.
- 15 For example: Tschakert, Petra; Coomes, Oliver T.; Potvin, Catherine (2007), "Indigenous livelihoods, slash-and-burn agriculture, and carbon stocks in Eastern Panama", Ecological Economics, 60. Available at: http://biology.mcgill.ca/faculty/potvin/articles/Tschakert_etal_07.pdf
- 16 Karsenty, Alain. (2009.) What the (carbon) market cannot do., CIRAD, Perspective No. 1, November 2009.
- 17 Office of the President, Republic of Guyana. (2008.) "Creating Incentives to Avoid Deforestation." December 2008, p. 11.
- 18 Office of the President, Republic of Guyana. (2008.), p. 16
- 19 For example: Jagdeo, Bharrat. (2009.) "Synopsis of the address made by President of Guyana at the opening ceremony of the 3rd Regional Meeting of the ACP-EU Joint Parliamentary Assembly", 25th February, Guyana. Available at: www.europarl.europa.eu/intcoop/acp/03_regional/pdf/jagdeo_en.pdf
- 20 MECNT (2009.), p. 28.
- 21 Gregersen et al (2010.), p. 10.
- 22 Office of the President, Republic of Guyana. (2008.), p. 11.
- 23 Singh, Thomas. (2009.) Comment on the McKinsey Report: "Creating Incentives to Avoid Deforestation", p. 6.
- 24 Gouldson, Andy. (2010.) The Transition to a Low Carbon Economy, Centre for Climate Change Economics and Policy, School of Earth and Environment, University of Leeds
- 25 "Report of the Informal Working Group On Interim Finance For REDD+ (IWG-IFR)". (Discussion Document.) (27 October 2009.) IWG-IFR. Available at: http://www.unredd.net/index.php?option=com_docman&task=doc_details&Itemid=&gid=1096, p. 23.
- 26 Presidential Decree No. 32/1990 states that peatlands deeper than 3 meters are protected for their water storage functions.
- 27 Each ha of forest is assumed to contain 200 t carbon or approximately 720 tCO₂. At a cost of \$1 per tCO₂e, the opportunity cost of protecting 50 ha would be \$36,000 (720 x 50 x 1); at \$29 per tCO₂e the opportunity cost of 50 hectares would be \$1,044,000 (720 x 50 x 29).
- 28 It should be noted that the DRC RPP has 'reduction of poverty' as a joint goal with 'reducing emissions'.
- 29 McKinsey & Company. (2009.), p.22.
- 30 Although the report does suggest improving some practices. MECNT (2009.), p. 43.
- 31 See TEEB (2010) "The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB". Available at: http://www.teebweb.org/LinkClick.aspx?fileticket=bYhDohL_TuM%3d&tabid=1278&mid=2357
- 32 MECNT (2009.), p. 28.
- 33 Both options are still included in the DRC's RPP – the palm oil will be on former Belgian palm oil plantations. MECNT (2009.), pp. 40 and 45.
- 34 DNPI. (2010.), p. 19-20
- 35 FERN, Global Witness, Greenpeace, Rainforest Foundation Norway and Rainforest Foundation UK (2010.) "A joint statement on the Readiness Preparation Proposal for the Democratic Republic of Congo", 15th March 2010. Available at: http://www.rainforestfoundationuk.org/files/DRC%20RPP%20Joint%20statement%20RFN%20RFUK%20GP%20FERN%20GW_15March2010.
- 36 We note that the Technical Advisory Panel Review for the DRC RPP says: "The transaction and implementation costs of a REDD+ program should be included in the cost curve before making extensive use of the curve (as is done in the latter sections of this R-PP) in preparing the REDD Strategy," from FERN, Global Witness, Greenpeace, Rainforest Foundation Norway and Rainforest Foundation UK (2010.)pdf
- 37 Anderson, Dave. (2009.) "McKinsey & Company carbon abatement cost curves: form over substance?" Richland, WA, USA: Pacific Northwest National Laboratory. Available at: <https://blog.pnl.gov/StructuredThinking/index.php/2009/07/mckinsey-substance/>
- 38 DNPI. (2010.), p. 22
- 39 See for example: Brown et al. (2005). Impact of selective logging on the carbon stocks of tropical forests: Republic of Congo as a case study. Available at: <http://zunia.org/uploads/media/knowledge/Deliverable6CarbonCongoFieldReport32905.pdf>
- 40 Global Witness. (2009.) Vested Interests: Industrial logging and carbon in tropical forests. Available at: http://www.globalwitness.org/media_library_get.php/1067/1288349797/vested_interests.pdf, p. 6.
- 41 Global Witness. (2009.), p. 17.
- 42 DNPI. (2010.), p. 22.
- 43 Quoted in Global Witness. (2009.), p. 6.
- 44 MECNT (2009.), p. 29.
- 45 Karsenty, Alain. (2009.) Commentaires sur le rapport « Potentiel REDD + de la RDC » préparé par le cabinet McKinsey pour le gouvernement de la RDC, CIRAD, 22 December 2009, p. 4.
- 46 Thomas, Mike and James, Stuart. (2008.) "Need a Strategy (or Policy) to Respond to the Risk of Climate Change? Don't Rely on a Simple Supply Curve Approach". Charles River Associates (CRA) International.
- 47 Kornevall, Christian. (2009.) "The McKinsey Curve – False Good News?" World Business Council for Sustainable Development's (WBCSD) Energy Efficiency in Buildings (EEB) project. February 2009. Available at: <http://www.eeb-blog.org/2009/02/the-mc-kinsey-curve-false-good-news.html>. Republic of Congo as a case study. Available at: <http://zunia.org/uploads/media/knowledge/Deliverable6CarbonCongoFieldReport32905.pdf>
- 48 Hatcher, Jeffrey. (2009.) "Securing Tenure Rights and Reducing Emissions from Deforestation and Degradation (REDD): Costs and Lessons Learned" (Paper No. 120). Washington, DC: The World Bank, Social Development Papers, p. 11.

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