# ARGUMENTS FOR AND AGAINST FOREST CARBON OFFSETS: AN ANALYTIC NOTE

7 August 2000

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This note draws on my paper, "Evaluating Carbon Offsets from Forestry and Energy Projects: How do they Compare?" (Policy Working Paper no. 2357, World Bank, 2000) and on a variety of other work. Its aim is to outline, in a systematic fashion, the *technical* arguments for and against creating emissions reductions from forestry projects under the CDM or indeed any regulatory mechanism that creates a carbon offset market in an uncapped context. (**This note, and the paper, take no position on whether emissions reductions from forestry are in fact creditable under the CDM**.) It devotes particular attention to the most vigorously debated class of forestry projects, those that attempt to reduce emissions from deforestation.

The note catalogs a variety of often inter-related arguments on a) whether or not it is possible meaningfully to quantify emissions reductions from forestry projects; b) whether or not local, national, and global welfare would be advanced by crediting such emissions reductions. For each set of arguments it identifies the key analytic and empirical issues underlying the argument-rebuttal pair. Evidence on some of these issues can be found in the working paper; but many others remain unresolved. It is my hope that this note will help to promote a more systematic and analytic examination of these issues.

I have benefited greatly from discussions with Mark Trexler, Daniel Lashof, Peter Frumhoff, Nigel Sizer, Pedro Moura Costa, and many others; but all opinions and errors are mine alone.

## *Arguments For And Against Forest Carbon With Specific Reference To CDM Projects*

| ***Against*** | ***For*** | ***underlying issues*** |
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| ER's (emissions reductions) from forest carbon are likely not 'real and additional'. Crediting these offsets leads to increased world GHG emissions because:<br>1. countries will claim credit for standing forests. (see also p.6 for moral hazard argument) | 1. If additionality tests are properly applied, countries would not be able to claim credit for protection of unthreatened standing forests. Techniques exist for distinguishing threatened forests from those that are naturally protected by remoteness. (Analogously, unjustified credits would result if CDM countries claimed offsets for existing hydropower facilities. However, additionality tests will prevent this.)<br>Additionality is often easier to demonstrate for forest carbon projects (which can impose costs on landholders while providing benefits to neighbors) than for many energy projects (which reduce fuel expenditure for project sponsors and are therefore potentially economically attractive.) | A. Can with-project carbon storage be measured?<br>B. Can baselines be set for forest carbon projects?<br>C. Can leakage be quantified or neutralized for forest carbon projects? |
| 2. we have no way of measuring emissions reductions, so projects will make unverifiable claims for offsets. | 2. Well-established statistical methods exist for measuring actual carbon stocks in standing forests. As noted above, techniques exist for identifying areas at high risk of deforestation over the short to medium run, permitting calculation of ERs over this period. Techniques for predicting year-by-year emissions for deforestation prevention projects are less well developed. | |
| 3. you can't really protect forests, you just divert deforestation elsewhere. These 'leakage' effects are pervasive and hard to measure. | 3. Effective deforestation-prevention projects would not merely fence off forests. Rather, they would incorporate actions that address the root causes of deforestation, neutralizing leakage. | |
| 1. Forest carbon projects don't provide long-lasting climate benefits because sequestered carbon is always at risk of release, by intention or accident.<br>2. Global warming is going to damage the forests anyway and release significant amounts of carbon, invalidating prior | 1. Even temporary storage provides a small but real permanent benefit – cumulative heating is delayed while the carbon is sequestered. In other words, temporary storage permanently retards the increase in temperature. If technical change in energy technology is rapid, then temporary sequestration may be part of a cost-effective long run abatement strategy. | D. What are the climatic and economic effects of temporary sequestration?<br><br>E. What are the prospects for reversal of anthropic pressures on forests during the 21st century? What are the dangers of climatically-induced release of forest carbon during the 21st century? |

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| credits for emissions reductions or sequestration | Some 'temporary' storage will in fact turn out to be permanent. Importantly, some forest may be under temporary threat of irreversible degradation. If we can ride out that threat until, for instance, economic development makes slash and burn farming unattractive, we will have some permanent gains.<br>2. Forests may suffer in some regions, but gain in others as a result of climate change. A portfolio approach – investing in forests in a variety of regions – could help secure some degree of long-term sequestration. | |
| Forest carbon ER's are worth less than ER's based on abatement because of the risk that forest offsets may be prematurely released. | 1. This is probably true (see above); but it does not mean that forest carbon offsets are worthless, but rather that they should be discounted or adjusted for risk. Ton-year adjustment is one possible approach.<br>2. It should be kept in mind that many classes of proposed energy offset projects are nominally permanent but in fact carry substantial risks of non-additionality or market leakage. In comparing the climate benefits of different types of projects, these different kinds of shortcomings should be kept in mind. | F. What are the leakage and additionality risks of energy projects?<br><br>D. What is the climatic and economic value of temporary sequestration? |
| "Allowing forest carbon makes carbon too cheap and lets the West off the hook." | 1. The Kyoto flexibility mechanisms, which are already accepted, separate *responsibility* for achieving emissions reductions from *location* of emissions reductions. The Western countries that are historically responsible for GHG emissions take on caps.<br><br>Should developing countries try to restrict Annex I flexibility by excluding forest carbon projects, thereby increasing Annex I costs of complying with Kyoto caps? There are several strong disadvantages of restricting Annex I flexibility from the viewpoint of developing countries:<br>• with restricted flexibility, abatement expenditures are | G. What are the direct and indirect benefits, for the developing countries, of abatement technologies used if CDM forest carbon is permitted, vs. those that will be used if it is excluded?<br><br>H. What are the Implications for the developing countries of Kyoto flexibility mechanisms: quantifying direct and indirect economic effects.<br><br>I. What is the willingness-to-pay for GHG reductions in industrial countries? what are the implications for Kyoto ratification and |

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| *(continued)* | directed more towards Western technology in industrial countries and primarily benefit Western companies and employees, while expenditures on forest carbon projects would tend to benefit rural areas in developing countries<br>• restrictions on forest carbon will result in higher energy prices, hurting energy-exporting developing countries<br>• consequent reductions in industrial countries' GDP will reduce demand for exports from developing countries (though this will be counterbalanced, to some extent by the migration of some industry and emissions to developing countries)<br>• if the industrial countries face higher compliance costs, they are more likely either to walk away from Kyoto, or successfully negotiate less stringent caps for future commitment periods.<br>2. Forest carbon projects are not cheap as a class; there are some theoretically low cost opportunities, but others are more expensive.<br>3. Expanding the class of acceptable projects will certainly expand the supply, but it is unlikely to depress the price substantially. Because plantation projects are relatively expensive, and deforestation prevention projects are complex to organize, it will be difficult to supply much forest carbon in the first commitment period.<br>4. To the extent that forest carbon could in fact succeed in lowering abatement costs, this would be good news for the cause of mitigating climate change. Kyoto barely scratches the surface of the reductions needed to stabilize the planet's climate. The lower the cost of reductions, the more quickly we can make progress at stabilizing climate. Thus prospects for a greater supply of real emissions reductions could be used to spur adoption of tighter emissions limits in the second commitment period and beyond. | compliance?.<br><br>S. Realistically, what would be the potential supply of emissions reductions from forest carbon projects during the first commitment period? |
| Introducing forest carbon will drive down the price of carbon offsets, reducing the incentive for technical innovation in | 1. Introducing forest carbon offsets raises the shadow price of GHG emissions from forestry and land use, and may therefore prompt the development of new emissions- | J. Do higher energy prices stimulate R&D on energy efficiency and emissions reductions? Are there more cost-effective mechanisms of doing so? |

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| reducing energy emissions. | reducing technologies. Because land management in developing countries has traditionally been of little commercial interest, there may be significant scope for innovation.<br>2. There appears to be little evidence that maintenance of high energy prices is a socially efficient way to induce R&D on energy-saving technologies.<br>3. Energy and forest carbon offsets may be complementary. It is probably more effective, in the long run, to reduce energy-related emissions by focusing long-term research and development on reducing emissions from the next generation of capital stock, rather than retrofitting existing equipment. Forest carbon can help bridge the gap while we are waiting for these new technologies to be developed and phased in. | K. Does an option to use temporary sequestration reduce the overall cost of achieving GHG abatement targets? |

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| Introduction of forest carbon hurts developing countries by driving down the price of carbon offsets | 1. Allowing new sources of offset supply will certainly reduce the price of energy-based ERs if demand is held constant. However, , supply in the first commitment period is likely to be quite limited, with limited effect on the overall price of carbon credits. In the longer term, the ability to supply more carbon offsets may facilitate stricter global (or Annex I) limits on emissions, tending to stabilize prices.<br>2. Without forest and land use carbon, CDM benefits will be highly concentrated on a very limited number of countries with large coal-dependent industrial and energy sectors. Introduction of forest and land use carbon spreads benefits among a much wider class of countries. | H. What are the implications for the developing countries of Kyoto flexibility mechanisms?: quantifying direct and indirect economic effects<br><br>S. .Realistically, what would be the potential supply of emissions reductions from forest carbon projects during the first commitment period? |
| Allowing credit for averted deforestation creates a moral hazard problem: countries (or actors within countries) will be tempted to reduce forest protection efforts or even to increase deforestation activities. | Analogous problems exist in the energy area, and standard solutions will have to be found. For instance: under what conditions would energy subsidies, or noncompliance with air pollution standards, be allowed as part of the baseline scenario for an energy project? In both the energy and forestry situations, there is a need to define clear rules about baselines. | L. How can baseline rules be drafted to prevent moral hazard in deforestation-prevention projects? |
| Credit for forest plantation projects can lead to environmental or social damage; e.g., through incentives to replace native forest with planted forest, impacts on soils and water tables | Analogous problems exist in energy projects – e.g environmental and social impacts of hydropower dams. In both energy and forestry projects, there is a need for environmental impact assessment and controls | M. Is it possible to institute effective environmental impact assessment and monitoring in forest plantation projects?. |
| Energy projects provide developing countries with needed technology transfer, while forestry and land use projects provide no such benefit. | In most developing countries, poverty is overwhelmingly rural, and technologies that increase farmer incomes are badly needed. Projects with agroforestry, silvopastoral, or plantation components can provide technologies that boost rural incomes and employment. Often these technologies can spontaneously diffuse – the real test of successful technology transfer. In contrast, many energy technologies are expensive and patent protected and may not readily diffuse. | N. What are the comparative rates of diffusion and distribution of benefits provided by energy and agroforestry technologies? |
| Forest carbon projects violate national sovereignty by requiring perpetual commitments to forest maintenance | 1. Some countries want to make perpetual commitments to forest maintenance in certain areas (e.g. critical watersheds) and are happy to find financial and technical assistance in doing this.<br>2. Future options for land use can be maintained through agreements for temporary sequestration, where carbon credits are adjusted for duration (e.g. through ton-year reckoning) | D. What is the climatic and economic value of temporary sequestration? |

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| Strategic considerations and the "low – hanging fruit problem": Developing countries worry that if they sell offsets from deforestation prevention today, they will find it more expensive to comply at some future time if they agree to take on caps. Or, future caps will be based on the reduced with-project emissions, rather than the business as usual scenario | Strategic responses:<br>1. Sale of emissions reductions from forestry is an option, rather than a requirement.<br>2. Some emissions reductions opportunities are of the "use it or lose it" variety. Many forests are in the process of being irreversibly converted to other land cover. After a forest is destroyed, there are no further emissions from this source to abate in the future.<br>3. If you think that ER prices are going to go up, you could produce the ERs now and bank them for later sale; or sell ongoing services through a ton-year system<br>4. A CDM country might plausibly argue that project baselines (by definition, the business as usual scenario) would serve as the basis for future negotiations on caps – not the observed, with-project emissions.. | O. What is the optimal national strategy for sale of emissions reductions, given large uncertainties about future markets and the evolution of the UNFCCC? |