Journal of Forest and Livelihood
Vol 8 (1) February 2009 ISSN 1684-0186

Carbon Financing and Community Forestry: A Review of the Questions, Challenges and the Case of Nepal

Samantha Staddon
Institute of Geography, University of Edinburgh, UK

© ForestAction Nepal
Satdobato, Lalitpur
PO Box: 12207, Kathmandu, Nepal
Contact number: +977 1 5552924; 5550631 **Fax:** +977 1 5535190
Email: forestaction@wlink.com.np**; URL:** www.forestaction.org

Carbon Financing and Community Forestry: A Review of the Questions, Challenges and the Case of Nepal

Samantha Staddon
Institute of Geography, University of Edinburgh, UK
Email: s.c.staddon@sms.ed.ac.uk

Abstract: Forestry-related 'carbon-offsetting' projects are widely seen as the ideal solution to three equally challenging problems of the 21st century: climate change, biodiversity conservation and socio-economic development. Hopes are being pinned on the potential of Reducing Emissions from Deforestation and Degradation (REDD) schemes, which after 2012 will represent the most likely route for bringing the currently excluded community forests into official climate change mitigation. However, not everyone is convinced of their potential, and some point instead to the challenges involved in ensuring both environmental gains and livelihood benefits. This paper provides a background to carbon financing involving forestry, focusing on community forestry in the global South. It goes on to review a number of questions and challenges which affect the potential efficiency and equity of 'carbon forestry'. Finally, it considers these issues with regard to community forestry in Nepal, arguing that they must be addressed in future policy or project development in the country.

Key words: carbon financing, community forestry, REDD, biodiversity conservation, livelihoods

INTRODUCTION

Forestry-related 'carbon offsetting' projects are widely seen as the ideal solution to three equally challenging problems of the 21st century: climate change, biodiversity conservation and socio-economic development. Hopes are being pinned on the potential of REDD schemes, which after 2012 will represent the most likely route for bringing the currently excluded community forests into official climate change mitigation measures. However, not everyone is convinced of their potential, and some are pointing to the challenges involved in ensuring both environmental gains and livelihood benefits. What benefit does 'carbon forestry' bring and to whom? What impact do different institutional arrangements and access rights have on this? How do different stakeholders participate in the process and how are power relations balanced among them? What are the risks to those involved and how may these be reduced? How do they contribute to the overall goal of climate change mitigation?

This paper provides a brief background to carbon financing mechanisms involving forestry, focusing on community forestry in the global South. It goes on to review a number of unresolved questions and challenges which affect the potential efficiency and equity of carbon forestry. Finally, it considers these issues with regard to community forestry in Nepal. In this paper I argue that these issues need to be taken into full consideration in any future policy or project development in the country in order that the purported global goals of carbon forestry are attained efficiently and equitably.

CARBON FINANCING AND COMMUNITY FORESTRY

The global response to climate change is coordinated through the United Nations Framework Convention on Climate Change (UNFCCC) and since early 2005, under the Kyoto Protocol (KP). Efforts to reduce atmospheric Greenhouse Gas (GHG) concentrations (and thereby mitigate increases in global temperatures) are being made through schemes that aim to reduce the use of fossil fuels, increase energy efficiency and sequester carbon dioxide in biological matter. In developing countries these schemes are managed in two ways[1]: first, regulated or certified projects which come under the Clean Development Mechanism (CDM) of the KP and which are regulated according to international standards; and second, 'voluntary' projects which operate outside of the KP and have no overall governing body, although voluntary standards may be complied to. These certified and voluntary projects involve the trading of Certified Emission Reduction (CER) or Voluntary Emission Reduction (VER) credits respectively. One CER or VER credit is typically equivalent[2] with the capture of one ton of carbon dioxide, and companies or individuals buy credits to comply with legal commitments for the purpose of Corporate Social Responsibility or for philanthropic reasons.

Almost all CDM projects involve energy efficiency or energy reduction, with only one out of the 400 registered projects relating to carbon sequestration through forestry, falling under the 'Land-Use, Land-Use Change and Forestry' (LULUCF) category. The lack of forestry projects is considered to be due to the high transaction costs of the CDM process and restrictions placed on forestry projects by the CDM (Peskett *et al.* 2006a). In contrast, the more flexible voluntary market is dominated by forestry related projects located throughout the global South (Peskett *et al.* 2006a).

Under the CDM's LULUCF programme, only Afforestation and Reforestation (AR) projects are currently recognized, and many projects in the voluntary market involve the planting of trees, meaning that there is little scope for projects that work through 'avoided deforestation'. Reasons given for the exclusion of avoided deforestation include the difficulties in ensuring 'additionality' (i.e. the project provides emissions reductions which are

additional to what would have occurred in its absence), problems in establishing 'baselines' (levels from which to estimate emission reductions due to the project), problems in preventing 'leakage' (changes in emissions due to project activities but which occur outside of the project area, e.g. shifting deforestation to another area), the problem of ensuring that reductions are permanent, the fact that the large potential scale of avoided deforestation emission reductions could flood the market, and finally, that it may reduce incentives for developed countries to 'de-carbonize' and reduce emissions through energy efficiency or energy reduction (Peskett *et al.* 2006b, Richards and Jenkins 2007, Karky and Banskota 2007).

Interest in the potential of avoided deforestation has been growing, however, and solutions to the problems listed above are currently being worked out through the development of a proposed mechanism under the KP called REDD. This new mechanism was conceived following a meeting of the UNFCCC in Nairobi in 2006 and the recommendations of the Stern Review (2006). Pilot avoided deforestation schemes are currently underway and REDD is expected to be operational after 2012, when the 'first commitment period' of the Protocol comes to an end[3]. Voluntary markets are also likely to implement avoided deforestation projects under REDD. As community forestry in the global South generally involves the protection of existing forests, REDD schemes could provide the first opportunity for community forestry to involve in global carbon financing.

QUESTIONS, CHALLENGES AND THE CASE OF NEPAL

REDD provides new opportunities for community forestry around the world, but many aspects of the scheme remain undecided, and it is unknown how it will work in practice. Other forestry-related offsetting schemes have received significant criticism because they involve large monoculture plantations which are not appropriate to the needs of the local populations because they reduce access to land and forest products and weaken co-operative arrangements or because community benefits are captured by local elites (Peskett *et al.* 2006a). Some go so far as to describe the carbon offsetting market as 'carbon colonialism' (Eraker 2000) in that the global South is being used as a means of cleaning up waste produced in the global North (Lovell 2008). All forestry-related CDM projects must contribute to biodiversity conservation and sustainable use of natural resources and must be in line with the host government sustainable development objectives. In practice, however, it has been claimed that projects have consistently failed to deliver development and sustainability benefits (Kollmus *et al.* 2008). Similarly, while many voluntary sector projects follow a variety of standards to avoid potential negative impact on the environment or sustainable development, the content and quality of those standards vary widely and none are certified by third parties[4].

REDD schemes will no doubt try to avoid such failures; however, now is the time to carefully consider the potential challenges of community carbon forestry. It is also important to take stock of the wealth of experience in community forestry, community-based natural resource management and common property that exists around the world. Mistakes made and lessons learnt in these fields must be taken on board in community carbon forestry so that if implemented, it truly succeeds in providing the promised environmental and development benefits.

This paper reviews the questions and challenges surrounding community carbon forestry based on REDD with reference to the case of Nepal. Nepal has a well-documented history of community forestry, which currently involves 38% of the population (1.2 million households), 14,000 Community Forest User Groups (CFUGs) and about 25% of all national forests (1.6 million hectares) (Department of Forests 2007, cited in Pokharel 2008). Nepal is also a signatory to the KP. There is interest in the potential of carbon offsetting and community forestry in the country (Banskota *et al.* 2007, 2008), but as CDM afforestation projects are only possible on lands which had no forest before 1990, the majority of Nepal's community forests are not eligible (Karky and Banskota 2007), and as yet no credits for carbon forestry projects within the country have been traded. In considering these questions and challenges, several issues are raised-although answers are not necessarily provided-that demand attention in any future policy or project development and implementation related to community carbon forestry in Nepal.

Livelihood Benefits and Benefit Sharing

What benefits might community carbon forestry entail and who will be the beneficiaries? Carbon offsetting and trading in carbon credits entail the transfer of money from the international market to a local setting, meaning that benefits arise in the form of previously unavailable financial funds. But in what form those funds arrive is important in determining how it benefits and who receives the benefits. It may be that direct payments are made, as in many voluntary sector carbon projects; however, it has to be decided whether payments will be made to individuals or to the community as a whole. The community may subsequently wish to distribute money to its members, but questions then arise as to whether this is done on an equal basis or on the basis of equity and need. In Nepal, money arising from carbon payments under the REDD scheme could potentially be funnelled at community level through pre-existing CFUGs which have funds and accounts already established. It would then be up to individual CFUGs to decide through annual general assemblies what to do with the funds and to address the

questions of whether money goes to individuals and if so, on what basis. Those involved in community forestry in Nepal will, however, be aware of the existing problems with the transparency of CFUG funds and the conflict this can provoke, thus bringing into question whether they represent the right institutions through which to work in carbon forestry, at least as they currently operate. However, whether some form of alternative could work more equitably and would be realistic to establish could equally be questioned.

Current CDM and voluntary sector projects differ in the payment schedules of carbon funds, with some paying only after a certain period of time in order to ensure gains in terms of tree protection while others pay certain start-up costs and then spread out remaining payments over time. Given that forest protection is ongoing, community carbon forestry through REDD may have low start-up costs compared to AR projects under the CDM or voluntary sector projects, which necessitate the purchasing and planting of seedlings and saplings. The distribution of payments over time is, however, important in determining at what point, and therefore to whom benefits accrue. Plan Vivo in Mexico is a well-respected model for small-scale forestry-related projects in the voluntary sector, and its project funds are distributed over seven years (Richards and Jenkins 2007). Whether this represents an appropriate time scale over which to deliver payments for community carbon forestry in Nepal would need to be decided. It may be necessary to compare potential carbon payments to expected incomes from other forms of forest-based enterprises, such as resin production from pine[5]. Whichever way it is decided, the communities involved should have a direct say in it, i.e. it shouldn't be left solely to the carbon financing companies.

In terms of how big a financial reward communities may expect from carbon forestry, an interesting study has been done which looks at case studies of community managed forests in Nepal and India (Banskota *et al.* 2007). The quantity of carbon sequestered in three Nepali CFUGs (in Ilam, Lamatar and Manang districts) was estimated as 6.89 tons of carbon dioxide per hectare per year, and using existing CDM market prices of between US$12-15 per ton of carbon dioxide it was calculated that on average payments may be worth up to US$82.68 (Nepali Rs 5,838) per hectare per year. Given that 1.1 million hectares of forest are managed by CFUGs in Nepal that equates with a potential US$90.9 million in payments (Nepali Rs 6.42 billion). Current average annual CFUG incomes are estimated to be worth over US$10 million (Kanel and Niraula 2004, cited in Pokharel 2008). Thus, income from carbon financing could represent an almost ten-fold increase over existing sources. However, the likelihood that such funds would be available on the international market, particularly if repeated around all countries in the global South, is low.

It has been pointed out that support from carbon forestry in the form of employment opportunities or the provision of community services may serve local pro-poor development needs more effectively than direct monetary payments (Luttrell *et al.* 2007). The experience of a voluntary sector carbon project in Mozambique, which involves the small-scale planting of native fruit trees and the adoption of conservation farming techniques, shows that the most important factor for project success is the provision of continued agricultural extension advice (Powell 2008). In Nepal there is currently great interest in forest-based enterprises and the provision of employment, particularly for the poorest within CFUGs, meaning that provision of employment through carbon forestry may be warmly welcomed. Jobs may be created for local monitoring and verification of forestry activities; however, these may be few in number and may necessitate skills in literacy, which the poorest and those with most to benefit from employment may not have.

It is thought that the REDD scheme may differ from the CDM and voluntary sector projects, which work at local level, as it will most likely operate at national or sub-national level (Peskett and Harkin 2007). Reasons given for this are to try and increase the scale of investment, reduce costs, prevent leakage and to be able to employ nationwide baselines of deforestation and degradation. It may be that all 14,000 CFUGs in Nepal meet certain eligibility criteria set out under REDD and thus all participate; however, if eligibility was limited or there was a cap on number of groups, difficult questions about which would participate may need to be asked. Would it be, for example, that only groups in areas of high deforestation or degradation are selected? Or would the age of a CFUG affect its potential inclusion? Or the age, composition, state and extent (and therefore carbon sequestration capacity) of the forest? Or would it be that payments are distributed to CFUGs throughout the country relative to the number of households contained and independent of the size of their forest? Such decisions would be contested and negotiations would need to ensure full representation of CFUG members.

Assuming that there are insufficient funds to support REDD schemes in all countries of the global south, the selection of countries to participate at global level is another important issue. Currently most CDM projects are located in South and Central America and in Asia, with only a few in Africa (Peskett *et al.* 2006a), although it is the poorest continent in the world and arguably most in need of the financing that carbon-offsetting projects can bring. If REDD projects are to include and favour community forestry, then Nepal is likely to be a good candidate on the global scale, given its well-respected and long-established community forestry programme.

With regard to livelihood benefits, the question is whether carbon-offsetting schemes should in fact be obliged to provide 'co-benefits' such as pro-poor development (Luttrell *et al.* 2007). Luttrell *et al.* (2007) point out that the primary aim of carbon financing is to sequester carbon and that by adding poverty objectives it may overload the climate change mitigation agenda. This is an ethical question in many ways and would be no different for Nepal than any other country. However, Nepal's community forestry programme explicitly (at least in theory) combines environmental and development objectives and would thus inherently (again in theory) offer co-benefits for any carbon-offsetting project.

Access Rights, Use Rights and 'Carbon Rights'

Land ownership and access rights are extremely important in determining who may benefit from carbon forestry. CDM and voluntary sector AR projects, for example, generally involve planting on privately-owned land. Thus, land rights and the amount of land owned are important factors in determining the eligibility of individuals and how much they may receive in carbon payments. With community forestry under the REDD scheme, however, individual land ownership would not be an issue as financing comes at the CFUG level and thus has the potential to benefit those with little or no land. In Nepal, access rights over community forests are clearly defined in the Operational Plan (OP) of all CFUGs, thus making this issue easy to deal with in some ways. However, OPs last for only up to ten years, after which time they must be renewed and approved by the government's Department of Forests; so access rights may not be assured for the entire length of a carbon-financing project. This problem would need to be addressed to give confidence to financing companies, traders and buyers.

The granting of particular access and use rights over community forests may not automatically equate with 'carbon rights' i.e. 'communities' right to claim the money for carbon sequestered in their forests. In New Zealand, for example, the government claimed carbon rights on all private and publicly-owned plantations between 2002 and 2007 (Peskett and Harkin 2007). At the moment CFUGs in Nepal keep all revenue from the sale of forest products, although the high-value *sal* (*Shorea robusta*) species of the Terai is taxed at 15% if sold outside of the CFUG. If carbon forestry were implemented, it can only be guessed at whether the Nepalese government would claim all revenues from carbon financing, or only a portion through taxes, or none (i.e. allow CFUGs to retain all funds). Again, such decisions would be contested, and negotiations would need to ensure full representation of CFUG members.

Negotiations, Power and Control

Community carbon forestry projects would bring together carbon trading companies operating on the international market with poor rural farmers in developing countries. The interests and expectations of these two parties may not necessarily be the same, and it is likely that the international trader will generally be in a position of far greater power in negotiations than the often illiterate and inexperienced rural poor (Peskett and Harkin 2007). Jindal (2008) writes that farmers do not necessarily understand the details of the contracts they hold under voluntary sector afforestation projects and that they may therefore unknowingly agree to payments that are too low to cover the costs of tree planting and land management techniques, which they are then contractually obliged to carry out. Individuals and communities in developing countries clearly need some form of help or representation in negotiations surrounding carbon forestry to ensure that they are not disadvantaged by the process. Peskett *et al.* (2006a) highlight the need for dispute resolution mechanisms to be set in place for cases where contractual agreements are not met, for example where the agreed quantity of carbon is not sequestered. This is again to ensure that poor farmers are not unduly disadvantaged in situations that might be beyond their control. Such representation may be possible in Nepal through the Federation of Community Forestry Users Nepal (FECOFUN), a civil society group representing the interests of CFUGs at district and national level. If REDD operates at national level, this organization may be in a strong negotiating position with international traders and can draw on its district offices to ensure local-level representation. Private companies may also take on an intermediary role between communities and international traders; however, steps such as the provision of accessible information on carbon markets directly to communities may be necessary to ensure that funds are not captured by the companies (Luttrell *et al.* 2007). It has been noted that there is little technical knowledge or expertise surrounding the policies and processes of carbon financing in Nepal (Banskota *et al.* 2008), indicating a need for capacity building of both civil society and the private sector with regard to carbon financing.

The negotiation power of individual countries within carbon financing projects such as REDD is also an important issue, particularly with regard to ensuring that financing mechanisms meet their own needs and expectations. As Peskett *et al.* (2006a) note, little attention has been paid to the development priorities or existing forestry policies of host countries in CDM and voluntary market forestry projects. If REDD operates at national level there is potentially more scope to negotiate processes which incorporate individual countries' priorities and policies; however, developing countries may forfeit these in the race to attract carbon financing. Carbon financing can also impact national

policies; the Zambian government has, for example, revised their forestry policy to re-classify all protected land and designate forests which will be exclusively protected for carbon sequestration (Siampale 2008). Whilst this may help Zambia to attract carbon financing, care should be taken to ensure that local development goals and poor farmers are not disadvantaged by these moves. Concerns have been raised that governments may adopt a 'fines and fences' approach to REDD, which could involve the removal of people from protected areas in order to claim carbon payments (Wunder 2007). Since implementation of REDD in Nepal heavily favours community forests, such risks would be minimal. However, it could also be seen as an opportunity for protected areas, in which case it would promote more severe punishments for the illegal collection of forest products from these areas, and the poorest would suffer the most.

Risks and Risk Reduction

Carbon forestry projects involve risks for both the seller, i.e. the individual farmer or community, and the buyer, i.e. international carbon traders and their clients. Risks to the sellers include the fluctuation of carbon credit prices on the international market, although it is thought that, compared to other internationally traded commodities, the outlook for carbon prices is good, at least in the short term (Capoor and Ambrosi 2006, cited in Peskett *et al.* 2006a). Individuals or communities selling carbon credits are also at risk if they are unable to deliver the agreed quantities of carbon sequestration, even if this may be beyond their control and a result of environmental conditions affecting growth rates of trees in afforestation projects for example. Jindal (2008) suggests that, in situations where environmental protection is unlikely, all payments for ecosystem service projects should be avoided. This is less likely to be a problem in relation to the protection of community forests in Nepal as they are already being managed with generally assured increases in biomass. Other risks may, however, arise if certain forms of management are specified in carbon forestry projects, for example, regarding species composition or harvesting regimes. This may negatively impact pre-existing patterns of forest product use that are essential in subsistence agriculture throughout the country, or it may reduce opportunities for alternative income sources from forest-based enterprises which involve less risk.

International traders in carbon credits are also at risk from the problem of the permanence of carbon sequestered, as they will have to guarantee permanent sequestration to their customers. Permanence may be a problem in areas with unclear land ownership, political instability and conflicts (Peskett and Harkin 2007). Some have noted that community forestry does not offer a particular attractive investment to carbon investors due to risks involved with tenure and scale (Luttrell *et al.* 2007). However, if community carbon forestry were to be encouraged through REDD, Nepal's programme is still likely to be an attractive one as it is well established and internationally respected.

Monitoring and verification of carbon sequestration could potentially be one way of encouraging and demonstrating permanence. Many agree with the need for rigorous scientific approaches to monitoring to provide credibility and transparency (Williams and Ryan 2008), but there is also interest in reducing the costs of monitoring and thereby increasing involvement by local people in measurements and assessments (Skutsch 2008, Banskota *et al.* 2007). The project mentioned above, which calculated the carbon sequestered in three Nepalese community forests used CFUG members to help measure and estimate above and below ground carbon stocks according to standards set by the Intergovernmental Panel on Climate Change (IPCC) at a cost of only US$5 per hectare per year (Nepali Rs 354) (Banskota *et al.* 2007, 2008, Skutsch 2008). Whilst local people were successfully trained in various aspects of field measurements, overall calculations necessitated expertise of technicians. Generally literate people who were involved in the measurements, and they frequently migrated from the village in search of employment opportunities, meaning that training would be needed each year before monitoring could take place (Banskota *et al*. 2007). Although the overall reported costs of monitoring were low, it was not made clear whether there were additional costs to the local community in either monetary or time commitments or whether they were recompensed.

Discussing small-scale forestry offsetting projects in the voluntary sector, Morrison and McGhee (2008) suggest that as far as possible responsibility for project implementation should be done at 'grass roots' level. Whilst this may increase local control and ownership, care must be taken to ensure that local community members are appropriately remunerated for their new responsibilities so that they are not disadvantaged through involvement in the process. Engaging community members in monitoring forests using scientific methods that require the expertise of technicians adds to what has been referred to as the 'professionalization of knowledge' (Nightingale 2005). Nightingale (2005) argues that in Nepal this goes against the objectives of the community forestry programme, which aims to foster local or indigenous knowledge. In the technologically sophisticated world of carbon calculations, however, the use of local knowledge is limited. Whilst this is not inherently a negative thing, it does demonstrate the potentially unexpected adverse impact of carbon forestry.

As mentioned previously, standards are followed in all CDM projects and many voluntary sector forestry carbon projects, and may be seen as a way to reducing risks for all parties. Voluntary sector standards vary greatly

(Kollmus *et al.* 2008), and the more complex and demanding they are the more likely they will ensure permanent carbon sequestration and co-benefits, including development and environmental gains. Complexity increases the cost of verification, however, and may mean that small-scale projects cannot comply with the standards. It is not known what form standards would take under REDD, but policy-makers would do well to build on the lessons learnt from the existing standards, which point towards a need to avoid a 'one size fits all' approach, streamlining standards with those of other sectors such as the Forest Stewardship Council (FSC)[6], and phasing in standards with increasing rigour (Peskett *et al.* 2007). The geographical scale on which standards are assessed is important, and it might be that in Nepal district is the most appropriate level given that this is currently the main divisional unit in forestry in the country.

The Overall Goal: Climate Change Mitigation

The final set of issues to be reviewed relates to the question of whether community carbon forestry does in fact help in the overall goal of climate change mitigation, particularly in relation to Nepal. The problem of 'additionality' and REDD i.e. ensuring that gains from the scheme are additional to what would have occurred if the scheme had not occurred has been raised above. There is a serious question of whether community forestry in Nepal would count as additional. Karky and Banskota (2007), who worked on the calculations of carbon sequestration rates in community forests in Nepal, pose this very question and conclude that 'it would be difficult to argue that the forest management activities of villages like Lamatar are truly "additional" in Kyoto terms' (p.74). Given that CFUGs have to demonstrate sustainable management of their forests in order to get their ten-year OPs approved by the Department of Forests and thus maintain use rights over them, it is indeed hard to see how community forestry in Nepal would be additional under REDD as it is likely to continue in its absence. It may be that for certain technical reasons this does not affect their eligibility, or there may be some way to argue this point to ensure their inclusion under REDD; however, the ultimate goal of climate change mitigation must remain the focus, particularly as people living in mountainous countries like Nepal are likely to be among the worst affected by climate change (Banskota *et al.* 2008). Carbon financing is not just about payments now for ecosystem services provided by community forestry, it is also about ensuring that in the long term people throughout the world are not made to suffer from the negative impact of climate change. In this case it may be that REDD schemes should be targeted in other areas of the world, where gains through REDD are truly additional, even though a country like Nepal would miss out on the much needed financial funds.

Another area with particular resonance in Nepal is the accusation that carbon-offsetting projects merely encourage the continued and avoidable use of dwindling oil supplies by those in the global North. The issue of 'Peak Oil'[7] has consequences for countries such as Nepal, which already suffers from fuel shortages, causing the shutdown of public transport and the social unrest and economic consequences of frequent *bandhas* (general strikes) in protest. Again, this raises the very difficult question of whether carbon forestry schemes should be encouraged in Nepal, or other countries, at all.

CONCLUSION

Carbon forestry is high on the international climate change agenda and is only likely to get higher after 2012 with the potential start of REDD. Some hail carbon forestry as the solution to the triple challenges of climate change, biodiversity conservation and socio-economic development. Others, however, dig deeper and recognize the complexity and intricacies involved in carbon forestry, particularly in relation to community forestry, where the issues of equity, control and power are utmost. Nepal's long experience with community forestry makes it in some ways an ideal candidate for carbon-offsetting financing through the REDD scheme. However, it may not be eligible for this new mechanism due to issues surrounding additionality. This paper has reviewed many questions and challenges that would need addressing in policy or project planning relating to community carbon forestry if it is to succeed in Nepal. Responding to these challenges is critical to ensure that attempts at carbon forestry would deliver not only an agreed quantity of carbon sequestration, but also benefits for all, including the most marginalized members of society. Some, however, question the worth of any forestry-related carbon-offsetting schemes and suggest that by promoting them we are merely tinkering at the edges of the carbon crisis.

ACKNOWLEDGEMENTS

Many thanks to Peter Branney, Meena Kunwar and Bishwas Rana at the Livelihoods and Forestry Programme for an interesting conversation on the subject of this paper. Thanks also to reviewers for their helpful comments on the paper and to ForestAction for asking me to submit it.

REFERENCES

Banskota, K., Karky, B.S. & Dahal, N. 2008. Creating a Voluntary Carbon Market for Promoting Sustainable Forest Management. In: S.B. Bajracharya and N. Dahal (Eds.), *Shifting Paradigms in Protected Area Management.* Kathmandu, Nepal: NTNC.

Banskota, K., Karky, B.S. & Skutsch, M. (Eds.) 2007. *Reducing Carbon Emissions through Community-*

managed Forests in the Himalaya. Kathmandu, Nepal: International Centre for Integrated Mountain Development.

Eraker, H. 2000. *Colonialism: Norwegian Tree Plantations, Carbon Credits, and Land Conflicts in Uganda* NorWatch. Available at: www.norwatch.no/index.php?artikkelid=689&back=1.

Jindal, R. 2008. Payments for Ecosystem Services and Poverty Alleviation Presented at the *Carbon and Communities in Tropical Woodlands an International Interdisciplinary Conference*, 16-18 June 2008. UK: University of Edinburgh.

Karky, B.S. & Banskota, K. 2007. Case Study of a Community-managed Forest in Lamatar, Nepal. In: K. Banskota, B.S. Karky and M. Skutsch (Eds.), *Reducing Carbon Emissions through Community-managed Forests in the Himalaya*. Kathmandu, Nepal: International Centre for Integrated Mountain Development.

Kollmus, A., Zinc, H. & Polycarp, C. 2008. *Making Sense of the Voluntary Carbon Market: A Comparison of Carbon Offset Standards.* Germany: WWF.

Lovell, H. 2008. The Ethics of Carbon Offsets Presented at the *Carbon and Communities in Tropical Woodlands an International Interdisciplinary Conference*, 16-18 June 2008. UK: University of Edinburgh.

Luttrell, C., Schreckenberg, K. & Peskett, L. 2007. The Implications for Carbon Financing for Pro-poor Community Forestry. Forestry Briefing 14. UK: Overseas Development Institute. Available at: www.odifpep.org.uk.

Morrison, A. & McGhee, W. 2008. Rural Livelihoods and Ecosystem Services: The Plan Vivo Experience Presented at the *Carbon and Communities in Tropical Woodlands an international interdisciplinary conference*, 16-18 June 2008. UK: University of Edinburgh.

Nightingale, A. 2005. The Experts Taught Us All We Know: Professionalisation and Knowledge in Nepalese Community Forestry. *Antipode*, **37**: 581-604.

Peskett, L., Luttrell, C. & Brown, D. 2006a. Making Voluntary Carbon Markets Work Better for the Poor: The Case of Forestry Offsets. *Forestry Briefing 11*. UK: Overseas Development Institute. Available at: www.odifpep.org.uk.

Peskett, L., Brown, D. & Luttrell, C. 2006b. Can Payments for Avoided Deforestation to Tackle Climate Change also Benefit the Poor? Forestry Briefing 12. UK: Overseas Development Institute. Available at: www.odifpep.org.uk.

Peskett, L., Luttrell, C. & Iwata, M. 2007. Can Standards for Voluntary Carbon Offsets Ensure Development Benefits? Forestry Briefing 13. UK: Overseas Development Institute. Available at: www.odifpep.org.uk.

Peskett, L. & Harkin, Z. 2007. Risk and Responsibility in Reduced Emissions from Deforestation and Degradation. Forestry Briefing 15. UK: Overseas Development Institute. Available at: www.odifpep.org.uk.

Pokharel, R.K. 2008. Pro-Poor Programs of Nepal's Community Forestry: Who Benefits? Presented at the *International Association for the Study of Commons 12th Biennial Conference*, 14-18 July 2008. UK: University of Gloucestershire.

Powell, P. 2008. Carbon Livelihoods – Communities and Conservation in Mozambique Presented at the *Carbon and Communities in Tropical Woodlands an International Interdisciplinary Conference*, 16-18 June 2008. UK: University of Edinburgh.

Richards, M. & Jenkins, M. 2007. Potential and Challenges of Payments for Ecosystem Services from Tropical Forests. Forestry Briefing 16. UK: Overseas Development Institute. Available at: www.odifpep.org.uk.

Siampale, A. 2008. The potential for Carbon Sequestration in the Terrestrial Ecosystems for Zambia Presented at the *Carbon and Communities in Tropical Woodlands an International Interdisciplinary Conference*, 16-18 June 2008. UK: University of Edinburgh.

Skutsch, M. 2008. Community Carbon Forestry: It's Niche in REDD, and Some Unresolved Technical Issues Presented at the *Carbon and Communities in Tropical Woodlands an International Interdisciplinary Conference*, 16-18 June 2008. UK: University of Edinburgh.

Stern, N. 2006. *Review on the Economics of Climate Change* HMG, UK.

Williams, M. & Ryan, C. 2008. Quantifying and Monitoring C Stocks in Tropical Woodlands Presented at the *Carbon and Communities in Tropical Woodlands an International Interdisciplinary Conference*, 16-18 June 2008. UK: University of Edinburgh.

Wunder, S. 2007. The Efficiency of Payments for Environmental Services in Tropical Countries. *Conservation Biology*, **21**(1): 48-58.

[1] Countries listed in Annex 1 of the Kyoto Protocol, i.e. developed countries, may also participate through two mechanisms, called Emissions Trading and Joint Implementation. Developing countries are often referred to as 'non-Annex 1 countries' and can only participate in the Protocol through hosting CDM projects.

[2] The KP relates to six anthropogenic GHGs, but as carbon dioxide is the major one the terms carbon financing/trading/offsetting are used as umbrella terms and quantities are expressed as carbon dioxide equivalents (CO_2e).

[3] It is still unsure what form the 'second commitment period' of the KP may take post 2012, or in fact whether it may be replaced by some other form of global framework.

[4] For a thorough review of the ten major standards used in the voluntary market, see Kollmus *et al.* (2008), and of the five standards Peskett *et al.* (2007).

[5] It may not be that all forest-based enterprises are contradictory and some in fact may be compatible with carbon forestry.

[6] The Forest Stewardship Council (FSC) operates a certification system which ensures consumers that certified products come from sustainably managed forests.

[7] Peak Oil refers to the point in time when the maximum rate of global petroleum extraction is reached, after which the rate of production enters terminal decline. The notion is being used by environmental and development campaigners in the fight against climate change and social inequities.