Literature Review for FSC Motion 10

Final Report

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1 Literature Review

1.1 Introduction

Well-functioning ecosystems provide reliable clean flows of water, productive soils, biodiversity and other ecosystem services (ES) for human communities. The use of markets and market-based mechanisms to conserve and pay for ES is a growing global trend.[1] In general, there are four types of ES markets: carbon markets, water markets, biodiversity markets and bundled services markets. Carbon markets reward the stewardship of carbon dioxide absorption form the atmosphere. Water markets provide payments for hydrological services such as the filtering of water through wetlands. Biodiversity markets create an incentive for the management or protection of habitat and species. Bundled services markets include a combination of carbon, water and biodiversity services, which include the ecosystem service payment built into the price of a product such as certified timber or produce.

Carbon trading has become the world's fastest growing commodities market.[2] In 2013, voluntary carbon offsets totaled 76 million tonnes of carbon dioxide equivalent ($MtCO_2e$), with a market value of $379 million. 28 million tonnes ($MtCO_2e$) of carbon offsets from forestry projects (26.5 million forested hectares) were purchased in 2012, at a value of $216 million.[3] The global annual biodiversity market was estimated to be worth at least $2.4 to $4.0 billion (U.S. dollars) in 2011; and payments for water-related ecosystem services totaled an estimated $6 billion worldwide in 2013.[4] FSC International is developing an FSC strategy and policy for ecosystem services certification. However, the integration of ecosystem services as part of the FSC standards poses potential risks to the FSC brand and its integrity. Risks with respect to claims made and rewards received in ecosystem markets are a concern for FSC involvement in Payment for Ecosystem Services (PES) programs. The

[1] 2009. *Beyond Carbon: Biodiversity and Water Markets*. Katoomba Group's Ecosystem Marketplace.
[2] International Criminal Police Organization (INTERPOL). 2013. *Guide to Carbon Trading Crime*. Environmental Crime Programme.
[3] Peters-Stanley, M. Gonzalez, G., and Yin, D. 2013. *Covering New Ground: State of the Forest Carbon Markets 2013*. Forest Trend's Ecosystem Marketplace. Washington, D.C.
[4] Madsen, B., Carroll, N., Kandy, D., and Bennett, G. 2011. *Update: State of Biodiversity Markets*. Washington D.C. Forest Trends. http://www.ecosystemmarketplace.com/reports/2011_update_sbdm; Bennett, G. and Carroll, N. 2014. *Gaining Depth: State of Watershed Investment 2014 – Executive Summary*. Forest Trend's Ecosystem Marketplace. http://www.ecosystemmarketplace.com/reports/sowi2014.

following literature review identifies the risks associated with ecosystem services claims and reward mechanisms in response to Motion 10 from the 2011 FSC General Assembly.

1.2 Claims

1.2.1 Misleading Claims

Carbon credit markets and other types of ecosystem service markets can potentially provide fraudulent claims. For example, the business as usual baseline scenario may be misreported resulting in an inflated claim so that the benefits from a project are not as significant as assumed. Intentionally misreporting or distorting the measurement or modeling of carbon can potentially increase the uncertainty of the results.[5] For example, data can be intentionally misreported, ES measurements can be manipulated by measuring only certain variables, or a biased site may be selected for collecting data.[6]

These risks are partially mitigated by third party validation (i.e. Designated Operation Entities). For example, the CDM (Clean Development Mechanism) requires third-party validation and verification, carried out by Designated Operation Entities (DOEs) certified by the CDM Executive Board, before a project receives credit. In terms of carbon offsets, the International Carbon Reduction and Offset Alliance (ICROA) has developed a Code of Practice that requires members to:[7]

1. Measure organizational or carbon footprints in accordance with internationally recognized standards such as ISO 14064-1, the WRI GHG Protocol or PAS 2050;
2. Work with customers to set GHG reduction targets and help them identify opportunities to reduce their carbon footprint so that they are not solely relying on offsets;
3. Use standards for offsets that have been evaluated by the ICROA Policy Working Group, which include American Carbon Registry, CarbonFix, the Verified Carbon Standard, the Climate Action Reserve, the Gold Standard, and the Clean Development Mechanism.
4. Demonstrate that carbon credits are real, measureable, permanent, additional, verifiable and unique;

[5] Bird, D.,N., Pena, N., Schwaiger, H., and Zanchi, G. 2010. *Review of Existing Methods for Carbon Accounting*. CIFOR: Bogor, Indonesia.
[6] International Criminal Police Organization (INTERPOL). 2013. *Guide to Carbon Trading Crime*. Environmental Crime Programme.
[7] ICROA. 2012. Code of Best Practice for Carbon Management Services: Executive Summary. London, UK. See: http://www.icroa.org/29/the-icroa-code-of-practice

5. Retire carbon offset credits in a traceable independent registry after they have been sold to ensure that those offsets are permanently matched against specific customer GHG emissions;
6. Work with customers to ensure that they are reporting their carbon footprint, reductions and offset actions accurately; and,
7. Submit to an annual audit and report member compliance (or non-compliance) to the ICROA Secretariat.

These requirements can be used to mitigate the risks of misleading claims. The ICROA also requires members to demonstrate compliance to the Code of Best Practice by submitting annual assessment reports that are assured by an independent third party auditor, which provides further risk mitigation and assurance.

1.2.2 Additionality

Additionality is one of the most significant factors that determines the integrity of a carbon offset project. As a result, additionality is a core concept of quality assurance for greenhouse gas (GHG) emissions reduction and sequestration activities. In the context of climate change mitigation, additionality refers to the net GHG emissions savings or sequestration benefits over and above what would have arisen in the absence of a given activity or project. In order to distinguish activities that are additional, a "business as usual" baseline is required to determine what would have happened if the project had not gone ahead.[8] Additionality could be used to characterize social, biodiversity and other types of net benefits associated with a given climate change mitigation activity or project, but the main focus has been on carbon or GHG benefits.

Additionality is widely viewed as a key issue in establishing the quality of carbon credits, but standards range in the degree of rigour and burden of proof required for project developers. There are tests and methodologies that can be used to assess different aspects of additionality (i.e. legal, regulatory and investment additionality; financial and investment additionality; and environmental additionality). A range of tests are used in practice but they are often combined into a single additionality accounting tool.[9] In general, there is a trade-off

[8] Ibid.
[9] Valatin, G. 2011. *Forests and Carbon: A Review of Additionality*. Forestry Commission. Edinburgh, Scotland.

between the rigour in establishing additionality and the cost-effectiveness of meeting the requirements.[10]

Therefore, additionality is a manageable risk that can be assessed using strong accounting and verification practices. The ICROA Code of Practice provides guidance on mitigation measures that can be used to address additionality as well as misleading claims.[11] These measures include:

1. Perform carbon measurement in accordance with internationally recognized standards such as ISO 14064-1, the WRI GHG Protocol or PAS 2050;
2. Use standards for offsets that have been evaluated by the ICROA Policy Working Group, which include American Carbon Registry, CarbonFix, the Verified Carbon Standard, the Climate Action Reserve, the Gold Standard, and the Clean Development Mechanism;
3. Retire carbon offset credits in a traceable independent registry after they have been sold to ensure that those offsets are permanently matched against specific customer GHG emissions; and,
4. Work with customers to ensure that they are reporting their carbon footprint, reductions and offset actions accurately.

All of the most prominent carbon reduction certification standards require some type of additionality test. These standards include the American Carbon Registry (ACR), Clean Development Mechanism (CDM), Climate Action Reserve (CAR), Climate, Community and Biodiversity Standard (CCBS), Gold Standard, and the Verified Carbon Standard (VCS).[12] The VCS has developed guidance on standardized methods for additionality and crediting, as well as technical guidance for nesting REDD projects.[13]

1.2.3 Double Counting

[10] Radov, D. Klevnas, P., and Skurray, J. 2007. *Market mechanisms for reducing GHG emissions from agriculture, forestry and land management*. Department of Environment, Food and Rural Affairs. NERA Economic Consulting. London, UK.

[11] ICROA. 2012. Code of Best Practice for Carbon Management Services: Executive Summary. London, UK. See: http://www.icroa.org/29/the-icroa-code-of-practice

[12] McFarland, B.J. 2011. „Carbon Reduction Projects and the Concept of Additionality.“ *Sustainable Development Law and Policy*. 11(2): 15-18.

[13] VCS. 2013. *Guidance for Standardized Methods*. VCS Guidance. (October 8, 2013, v3.3). (Available at: http://www.v-c-s.org/sites/v-c-s.org/files/VCS%20Policy%20Brief%2C%20Double%20Counting_0.pdf)

The fraudulent international sale of credits such as the sale of the same credit to different markets does take place.[14] In order for a claim or offset to be credible, it should be retired once it is sold. However, it is difficult to track credits sold in the context of several markets.[15] For example, a buyer can purchase offsets generated through a forestry project in another country, where the same credits may have been reflected in that country's emission inventory and therefore the project already replaced other reduction activities.[16]

Measures undertaken under the Clean Development Mechanism (CDM) and other voluntary carbon schemes to mitigate the risk of double sales include project location and owner information and procedures for opting in and opting out of different registries.[17] In addition, third-party registries can be used to retire and remove carbon credits used for offsetting. The best mitigation measure for fraudulent sales and double counting will be the establishment of an over-arching global reporting mechanism that will enable the tracking of international carbon and PES credits.[18]

1.2.4 Permanence

In the case of carbon offsets, the concept of permanence refers to the assurance that the project's offsets are permanent. In the case of land-based sequestration projects, the land set aside should be guaranteed as protected from conflicting purposes such as logging or urban development.

In order to guarantee permanence, it is key to establish clear and transparent guidelines on accounting methodologies, reporting, monitoring and verification. And, it is important that the methodologies are difficult to manipulate. The principles of international benchmarks such as the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and ISO 14064-2:2006 provide guidance for addressing the issue of permanence. Internationally recognized standards such the Verified Carbon Standard and the Gold Standard have incorporated and developed further guidance and methodologies to address measures such as additionality

[14] Ramseur, J.L. 2009. *Voluntary Carbon Offsets: Overview and Assessment*. CRS Report for Congress. Congressional Research Service.
[15] International Criminal Police Organization (INTERPOL). 2013. *Guide to Carbon Trading Crime*. Environmental Crime Programme; Ramseur, J.L. 2009. *Voluntary Carbon Offsets: Overview and Assessment*. CRS Report for Congress. Congressional Research Service.
[16] Ramseur, J.L. 2009. *Voluntary Carbon Offsets: Overview and Assessment*. CRS Report for Congress. Congressional Research Service.
[17] Schneider, L., Kollmus, A., and Lazarus, M. 2014. Addressing the risk of double counting emission reductions under the UNFCCC. Stockholm Environmental Institute: Stockholm.
[18] VCS. 2012. *Double Counting: Clarification of Rules*. VCS Policy Brief. (February 1, 2012). Verified Carbon Standard. (Available at http://www.v-c-s.org/sites/v-c-s.org/files/VCS%20Policy%20Brief%2C%20Double%20Counting_0.pdf)

and permanence. At the international level, it is necessary to standardized approaches among different countries and to improve transparency in the accounting, reporting and monitoring of PES and credit programs.[19]

1.2.5 Complexity and costs

The high complexity and costs of acquiring PES credits are often prohibitive, especially in low-income communities and developing countries. The application of carbon accounting methodology requires specialized and technical training or the hiring of an auditor that is unaffordable for the majority of small land owners in least developed countries.[20] The complexity of carbon measurements and the establishment of additionality for project accounting makes it difficult for smallholders and communities to access carbon markets.[21] Carbon monitoring involves technical knowledge on tree growth rate, soil carbon, and tree species that is not always available or feasible to collect.[22]

In addition, often the processes are too complicated for the expertise available in some countries, and the costs of DOEs (Designated Operation Entities) can be further prohibitive, due to the requirements of validation and verification.[23] At the same time, it is important to avoid a race to the bottom for accreditation and to promote accessibility and rigor. These constraints are applicable to other ES, such as water and biodiversity, in terms of measurement and impact assessment.

There are programs and community support measure that can be implemented to assist communities and individuals in low-income areas. For example, PES programs and credit suppliers can work within communities to train local experts as ecosystem service auditors, and create group projects to reduce costs for individual landowners.

1.2.6 Risk to other ecosystem service values and social well-being

[19] International Criminal Police Organization (INTERPOL). 2013. *Guide to Carbon Trading Crime*. Environmental Crime Programme.
[20] Clean Development Mechanism (CDM) Executive Board.2006. *Equitable distribution of clean development mechanism project activities – Analysis of submission*. EB 26: annex 4.
[21] Donovan, P. 2013. *Measuring Soil Carbon Change*: A flexible, practical, local method. http://soilcarboncoalition.org/files/MeasuringSoilCarbonChange.pdf; Milne 2002
[22] Ibid.
[23] Clean Development Mechanism (CDM) Executive Board. 2012. *Equitable distribution of clean development mechanism project activities: Analysis of Submission*. EB 26: Annex 4.

Carbon projects focus on one ecosystem service (i.e. carbon storage), which has often negatively affected other ecosystem services, such as watershed and biodiversity services.[24] For example, some CDM projects have resulted in monoculture woodlots that have caused social, economic and environmental damage.[25] This is a potential issue for other ecosystem service projects. For instance, projects focusing on water flow may affect the water supply for the irrigation of local crops, creating droughts and affecting farmers.[26]

PES programs can target multiple ecosystem services. This approach is called Stacking Ecosystem Services wherein landowners receive more than one payment for the ecosystem services provided by a single property parcel.[27] Stacking allows for the payment of a broader range of ecosystem benefits in a cost-effective manner.[28] There are different forms of stacking including: 1) horizontal stacking refers to a project that provides more than one ecosystem service on the same land area and the participant receives a single payment for each service (also called credit grouping); 2) vertical stacking refers to a project that receives multiple payments for a single management activity on the same land area; and 3) temporal stacking which includes one management activity with payments disbursed over time.[29] However, stacking makes accounting more complicated and can lead to double counting whereby one ES is sold twice, which can occur when bundles of services overlap with another single service credit or another bundle (e.g. wetland mitigation credits and water quality credits). Stacking can also make it more difficult to calculate additionality.

Although stacking presents greater complexity, the benefits of implementing a more comprehensive and holistic approach to PES programs provides a wider range of ecological benefits and increase the revenues for landowners.

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[24] Karousakis, K., and Brooke, Q. 2010. *Cost-Effective Targeting of PES*. Organization for Economic Co-operation and Development (OECD). Paris, France.

[25] Karumbidza,B., and Menne, W. 2011. *CDM Carbon Sink Tree Plantations: A case study in Tanzania*. Timberwatch Coalition.

[26] Karousakis, K., and Brooke, Q. 2010. *Cost-Effective Targeting of PES*. Organization for Economic Co-operation and Development (OECD). Paris, France.

[27] Cooley, D. and Olander, L. 2011. *Stacking Ecosystem Services Payments: Risks and Solutions*. Nicholas Institute for Environmental Policy Solutions Working Paper NI WP 11-04. Nicholas Institute for Environmental Policy Solutions. Duke University.

[28] Karousakis, K., and Brooke, Q. 2010. *Cost-Effective Targeting of PES*. Organization for Economic Co-operation and Development (OECD). Paris, France; Cooley, D. and Olander, L. 2011. *Stacking Ecosystem Services Payments: Risks and Solutions*. Nicholas Institute for Environmental Policy Solutions Working Paper NI WP 11-04. Nicholas Institute for Environmental Policy Solutions. Duke University.

[29] Cooley, D. and Olander, L. 2011. *Stacking Ecosystem Services Payments: Risks and Solutions*. Nicholas Institute for Environmental Policy Solutions Working Paper NI WP 11-04. Nicholas Institute for Environmental Policy Solutions. Duke University.

One of the challenges for PES programs that target multiple ES is the accounting for multiple benefits. Some of the limitations associated with multiple benefits PES programs are the inherently high variability in biodiversity and the provision of ecosystem services across landscapes and sites, the lack of data on the outcomes of specific land management practices and changes in ES provision, and weak metrics for measuring and monitoring ES. There are several ways that PES programs can account for multiple benefits of ES including: aligning PES targets with national or regional land use or conservation priorities; identifying overlap among multiple benefits at the spatial scale; and using multiple criteria for scoring or ranking eligible projects.[30]

1.2.7 Green-Washing

The integration of ES into a company's business strategy is a tool to increase environmental and social credibility with the public and a great opportunity for market differentiation that can attract consumers, a greater market share and provide a competitive advantage in terms of sustainable sourcing and image.[31]

However, payment for ecosystem services (PES) can be used as a form of green-washing. Greenpeace has identified four categories of green-washing: 1) touting an environmental program or product, while the corporation's product or core business is inherently polluting; 2) exaggerating an environmental achievement in order to divert attention away from environmental problems; 3) advertising or speaking about corporate "green" commitments while lobbying against pending or current environmental laws and regulations; and, 4) advertising or branding a product with environmental achievements that are already required or mandated by existing laws. Green-washing contributes to skepticism among the public, which may impact companies that are investing in progressive sustainable practices.[32]

As the demand for sustainable products (i.e. certified forest products) remains high, there are incentives for companies to make false claims regarding sustainability and environmental performance to increase their market share. On-going green-washing may impact the

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[30] Forest Carbon Partnership. 2011. *Lessons Learned for REDD+ from PES and Conservation Incentive Programs: Examples from Costa Rica, Mexico and Ecuador*. http://www.forestcarbonpartnership.org/sites/forestcarbonpartnership.org/files/Documents/PDF/Dec2011/report_summary_eng.pdf [Last accessed 05.09.2014]

[31] Tholen, J., Mulder, I., and Howard, P. 2009. *Sustainable Insights: The Nature of Ecosystem Service Risk for Business*. KGMP, UNEP FI and Flora and Fauna International. Amstelveen, The Netherlands.

[32] Horiuchi, R., Schuchard, R., Shea, L., and Townsend, S. 2009. *Understanding and Preventing Greenwashing: A business guide*. URL: https://www.bsr.org/reports/Understanding%20_Preventing_Greenwash.pdf ; Gallicano, T.D. 2011. *A Critical Analysis of Greenwashing Claims*. Public Relations Journal. 5 (3).

decisions of consumers who may lose their trust in the certification of products.[33] Therefore, being associated with companies or certification schemes that have been considered to make false claims represents a serious threat to the credibility of a brand.

In order to mitigate the impact of green-washing, best practices must be undertaken when designing or adopting standards and methods of measurement for PES programs. Internationally recognized standards and third-party verification can be used to minimize the risks of programs being associated with green-wash.

1.3 Rewards

1.3.1 Social Safeguards

There are several social safeguards that need to be considered when implementing PES programs. These include fostering an understanding of the project's ecosystem services and the regulations of the PES program, consideration of local cultural values, safeguarding the local rights over natural resources and education on the required performance level and contractual agreements of the program.[34]

Social safeguards and the monitoring of social impacts are tools that can be used to mitigate the potential negative social impacts of PES.[35] These practices reduce investment risks, increase the involvement of local communities and produce positive social impacts associated with ES programs.

Benefit sharing is the one of the key safeguards to mitigate the social impact of PES programs and their markets. Regulation of benefit sharing to ensure that low income stewards and landowners receive a fair share of the benefits is required.[36] Benefit sharing is

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[33] Newell, S. J., Goldsmith, R. E., and Banzhaf, E.J. 1998. "The effect of misleading environmental claims on consumer perceptions of advertisements." *Journal of Marketing Theory and Practice*. 6: 48-59.

[34] The Katoomba Group and Forest Trends (2008). *Payments for Ecosystem Services. Getting Started: A Primer*. UNEP. Nairobi, Kenya.

[35] Karumbidza, B., and Menne, W. 2011. *Carbon Sink Tree Plantations: A Case Study in Tanzania*. Timberwatch Coalition; Forest Carbon Partnership. 2011. *Lessons Learned for REDD+ from PES and Conservation Incentive Programs: Examples from Costa Rica, Mexico and Ecuador*. http://www.forestcarbonpartnership.org/sites/forestcarbonpartnership.org/files/Documents/PDF/Dec2011/report_summary_eng.pdf [Last accessed 05.09.2014]; Colchester, M., and Ferrari, M.F. 2007. *Making FPIC Work: Challenges and Prospects for Indigenous Peoples*. FPIC Working Papers. Forest Peoples Programme. Moreton-in-Marsh, UK.

[36] Milder J.C., Scherr, S.J. and Bracer, C. 2010. "Trends and Future Potential of Payment for Ecosystem Services to Alleviate Rural Poverty in Developing Countries". *Ecology and Society*. 15(2):4; The Katoomba Group and Forest Trends. 2008. *Payments for Ecosystem Services. Getting started: A Primer*. UNEP. Nairobi, Kenya.

also important for ensuring the long-term commitment of communities to the PES projects.[37] Regulations can be designed to encourage a participatory and open process, and to guarantee the respect of land tenure rights, thereby avoiding resource appropriation.[38]

A poor benefit sharing scheme can result in several negative consequences including increased social conflicts, less reliable provision of the project's ecosystem services and higher risks for potential investors.[39] The distribution of benefits amongst intermediaries and organizations involved in a PES project, results in commodity producers generally receiving a limited percentage of the final cost, so that they often derive only marginal benefits from these markets.[40] For example, one study estimated that more than 60 per cent of a project's investment might be taken by intermediaries and 30 per cent may be taken up by project costs, leaving minor income for the beneficiaries.

The major principles that can be utilized as safeguards within certification or accreditation programs to guarantee benefits sharing include: involvement of all community stakeholders in decision-making on projects, with particular attention to vulnerable groups; the securement of land and civil rights; the establishment of efficient administrative procedures; implementation of transparency and dispute resolution procedures; and the establishment of mechanisms for monitoring, reporting and evaluation.[41] In addition, PES programs can promote the establishment of community-driven projects that enable full producer participation, the implementation of standardized projects' operations and procedures to reduce costs over time, programs to foster an understanding of ecosystem services and the regulations of a PES program, and investment in local training to reduce the need for external experts.

The Centre for People and Forests has developed an assets and equity framework for evaluating the impacts of PES on poverty. According to their report, the poverty reduction potential of any scheme largely depends on how it interacts with: the asset bases available to

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[37] Haas, J.M. 2009. *Introducing Local Benefit Sharing Around Large Dams in West Africa*. International Institute for Environment and Development. London, UK.

[38] Milder J.C. , Scherr, S.J. and Bracer, C.. 2010. "Trends and Future Potential of Payment for Ecosystem Services to Alleviate Rural Poverty in Developing Countries". *Ecology and Society*. 15(2):4.

[39] Haas, J.M. 2009. *Introducing Local Benefit Sharing Around Large Dams in West Africa*. International institute for Environment and Development. London, UK.

[40] The Munden Project. 2011. *REDD and Forest Carbon: Market Based Critique and Recommendations*.

[41] Karumbidza, B., and Menne, W. 2011. CDM Carbon Sink Tree Plantations: A case study in Tanzania. Timberwatch Coalition; Forest Carbon Partnership (FCP) 2011. *Lessons Learned for REDD+ from PES and Conservation Incentive Programs: Examples from Costa Rica, Mexico, and Ecuador*; Colchester, M., Ferrari, M.F., 2007. *Making FPIC work: challenges and prospects for indigenous peoples*. FPIC Working Papers. Forest Peoples Programme: Moreton-in-Marsh, UK; Steni, E. (ed). 2010. *Beyond Carbon: Rights – based Safeguard Principles in Law*. HuMA. Jakarta, Indonesia; Loft, L., Thu, P., and Luttrell, C. 2014. *Lessons from Payments for Ecosystem Services for REDD+ Benefit-Sharing Mechanisms*. CIFOR Infobrief 68.

the poor; their livelihood flows; and the drivers contributing to their impoverishment, including processes of political and social marginalization and vulnerability to social and environmental risk. Key principles that can be used for monitoring and evaluation include:[42]

- Enable poor households or groups to access schemes and obtain tangible benefits;
- Strengthen financial assets and flows at the local level;
- Improve human assets and well-being;
- Secure natural assets and flows;
- Strengthen social and political assets and processes; and,
- Improve physical assets and access to them.

This type of framework can be used to evaluate and monitor PES projects at the local level to mitigate negative social impacts and to assess the needs of each community within a PES program.

1.3.2 Carbon and Biodiversity Offsets

Offsets are ecosystem service payments for actions that mitigate or compensate for environmental damage.[43] Offsetting describes the process whereby individuals, businesses or governments purchase 'credits' generated from projects that provide an ecosystem service such as carbon storage by forests that offset the release of greenhouse gas emissions or a wetland credit that offsets the impact of development with the restoration, creation or enhancement of a wetland or stream elsewhere.[44] The concept of offsetting in the case of carbon is that the removal of carbon dioxide from the atmosphere counterbalances GHG emissions from other sources (i.e. burning oil, coal and gas or other fossil carbon).[45] This concept also applies to mitigation credits, which offset impacts from a point source (i.e. water quality credit) or the impacts on an ecosystem that provides multiple services (i.e. damage to a stream) where conservation activities compensate for harming biodiversity elsewhere or on-site.[46]

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[42] Lee, E. and Mahanty, S. 2009. *Payments of Environmental Services and Poverty Reduction: Risks and Opportunities*. The Centre for People and Forests. RECOFTC. Bangkok, Thailand.

[44] Cooley, D. and Olander, L. 2011. *Stacking Ecosystem Services Payments: Risks and Solutions*. Nicholas Institute for Environmental Policy Solutions Working Paper NI WP 11-04. Nicholas Institute for Environmental Policy Solutions. Duke University.

[46] ten Kate, K., Bishop, J., and Bayon, R. 2004. *Biodiversity Offsets: Views, experience and the business case*. IUCN, Gland, Switzerland; Cooley, D. and Olander, L. 2011. *Stacking Ecosystem Services Payments: Risks and Solutions*. Nicholas Institute for Environmental Policy Solutions Working Paper NI WP 11-04. Nicholas Institute for Environmental Policy Solutions. Duke University.

However, offsetting in the context of forest carbon credits has been particularly controversial and has been challenged by several sources.[47] Forestry projects cannot guarantee the permanent reduction of GHG emissions because they are susceptible to natural disturbance such as fire and insects. In addition, mitigation credits create the impression that pollution and other impacts on the environment can continue to increase as long as the damage is repeatedly compensated by credits from actions elsewhere. However, in the case of carbon credits if an overall regulatory cap on GHG emissions is not in place, then forest carbon credits can be issued even though active carbon in the atmosphere continues to increase. In addition, the earth's ecosystems and resources are finite, so the overall damages to ecosystems and their services needs to be monitored and evaluated.

Similar to carbon offsets, biodiversity offsets are a mechanism to compensate for the environmental impacts of development. They have been defined as "the measurable conservation outcomes that result from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken."[48] The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity.

The concept of biodiversity offsets has been controversial because there is a risk that offsets can encourage projects that severely impact biodiversity to go ahead simply because they can offer offsets from conservation projects elsewhere to compensate for environmental impacts. The concern has been that companies would be allowed to operate with significant impacts in operation areas. To address this concern BBOP (The Business an Biodiversity Offsets Programme) has developed a mitigation hierarchy that views offsets as a last resort, "after all reasonable measures have been taken first to avoid and minimize the impact of a development project and then to restore biodiversity on-site." They have developed a Standard on Biodiversity Offsets that has been agreed upon by an international, multi-stakeholder group. This standard was published in 2012, and it includes transparent assessment and reporting of progress in the application of the hierarchy.[49] The aim of the standard is to enable companies and auditors to determine whether international best practice has been followed in avoiding and minimizing impacts on biodiversity, undertaking

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[48] The Business and Biodiversity Offsets Programme (BBOP). 2013. *To No Net Loss and Beyond: An Overview of the Business and Biodiversity Offsets Programme (BBOP*). Washington, D.C.

[49] The Standard on Biodiversity Offsets (http://bbop.forest-trends.org/guidelines/Standard.pdf)

restoration, and ultimately offsetting any residual impacts to demonstrate no net loss and preferably a net gain of biodiversity.

The Business and Biodiversity Offsets Programme offers a set of principles that also provide guidance for addressing the risks and limitations of integrating ES standards. These include:

- Adherence to the BBOP mitigation hierarchy, which is based on the definition of a biodiversity offset as compensation for significant residual adverse impacts on biodiversity identified after avoidance, minimization and on-site rehabilitation measures have been taken.
- There are limits to what can be offset, whereas there are residual impacts that are not acceptable and cannot be fully compensated for by a biodiversity offset because of irreplaceability or vulnerability of the biodiversity affected.
- A biodiversity offset should be designed and implemented in a landscape context so that a full range of ecological, social and cultural values are considered.
- Measureable conservation outcomes should achieve in situ no net loss and preferably a net gain of biodiversity.
- Biodiversity offsets should achieve additional conservation outcomes above and beyond results that would have occurred if the offset had not taken place, and should avoid displacing activities harmful to biodiversity to other locations.
- Effective participation of stakeholders in decision-making regarding the evaluation, selection, design and implementation and monitoring for the offset should be ensured in the areas affected by the project and offset.
- Offsets should be designed and implemented in an equitable manner, which includes sharing the rights, responsibilities, risks and rewards associated with a project with stakeholders.
- Biodiversity offsets should be based on an adaptive management approach that incorporates monitoring and evaluation with long-term outcomes.
- Design, implementation and communication of the results of biodiversity offset projects should be reported in a transparent and timely manner.
- Scientific and traditional knowledge should be included in the design and implementation of the offset program.

Similarly, the ICROA Code of Best Practice provides guidance for mitigating the risks of carbon offsets including using the best internationally recognized standards that are reported as real, measureable, permanent, additional, independently verified, unique and that are retired via third-party registries.

The Forest Carbon Partnership's summary of lessons learned from PES and conservation incentive programs provides excellent overall guidance stating that participation agreements for programs must be well delineated to prevent fraud and abuse, frameworks for rewarding conservation actions or outcomes must be provided, legal documents need to be more accessible at the local level, trade offs and synergies among multiple ES benefits must be accounted for in targeted payments and/or incentives, and measuring, reporting and verification (MRV) systems must be developed based on existing PES MRVs.[50]

1.3.3 Tax Fraud and Money Laundering

Credits of intangible commodities can be used to commit financial crimes such as tax fraud, especially in countries with poor regulations.[51] This fraud (common in transactions of small goods among different countries) is particularly attractive for carbon credits, as the credits are transferred electronically. INTERPOL estimated that VAT tax fraud related to carbon credits in Europe resulted in losses of five billion euros over approximately 18 months.[52] Credit transfer mispricing, money laundering and the use of tax havens to evade taxes are potential issues in credit trading.[53] Transfer mispricing or transfer pricing manipulation, refers to trades between two related parties at artificial prices for the purpose of tax avoidance. In addition, there have been cases of stolen carbon credits as a result of hacking attacks. For instance, the European EU-ETS was vulnerable to cyber-attacks because the security standards varied greatly among the member countries so the European Commission had instituted minimum security requirements. As a result, computer hackers stole two million carbon credits from registries in Austria, the Czech Republic, Estonia, Greece and Poland[54]

Most countries have adopted legal, regulatory and operational measures to stop money laundering, which require financial institutions to identify unusual or suspicious behavior and to report transactions to the country's financial intelligence unit. Some countries have now adopted regulations to minimize the risk of carbon traders being used for money laundering.

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[50] Forest Carbon Partnership. 2011. *Lessons Learned for REDD+ from PES and Conservation Incentive Programs: Examples from Costa Rica, Mexico and Ecuador*. http://www.forestcarbonpartnership.org/sites/forestcarbonpartnership.org/files/Documents/PDF/Dec2011/report_summary_eng.pdf [Last accessed 05.09.2014]

[51] International Criminal Police Organization Environmental Crime Programme. 2013. *Guide to Carbon Trading*. Interpol. Lyon, France; Martin, P., and Walters, R. 2013. "Fraud risk and the visibility of carbon." *Crime Justice Journal*. 2:27-42.

[52] Ibid.

[53] Ibid.

[54] Ibid.

For example, the Australian government amended its Anti-Money Laundering legislation to explicitly mention traders and brokers of carbon credits to ensure they adopt anti-money laundering measures and to report suspicious transactions.[55] Similarly, a European Union Directive requires similar anti-money laundering measures for persons engaged in financial investments related to climatic variables and emission allowances. The EU Climate Change Committee adopted new regulations in 2011 to improve the security of the registries to prevent fraud and bring them into line with the security measures in the financial sector.

Thus, in order to mitigate the risks of tax fraud, money laundering and stolen credits, strong regulations must be put in place that provide anti-money laundering measures, regulators will need to ensure that all tax loopholes are closed in regards to dealing with large volumes of credits being exchanged between multiple carbon markets, and security requirements for credit registries must be in line with measures taken by the larger financial sector. It is also important to ensure that the regulations and legislations implemented to address these issues are consistent across all jurisdictions.

[55] International Criminal Police Organization Environmental Crime Programme. 2013. *Guide to Carbon Trading*. Interpol. Lyon, France; Chan, M. 2010. *Ten Ways to Game the Carbon Market*. Friends of the Earth.

1.4 Conclusions

In summary, there are several risks and limitations associated with ES claims and rewards. Safeguards and measures will need to be developed or adopted to mitigate such risks in terms of the methodologies used, additionality, the potential for misleading or incorrect reporting, double counting and fake credits, impacts on the provision of other ecological benefits, social or cultural impacts, benefits sharing, and the risk of illegal sales.

Some of these risks, such as illegal sales of offsets, tax fraud, and money laundering, need to be addressed by stronger regulations, security and legislation at the political level. In terms of risks due to accounting issues and misreporting, there are measures available to directly reduce the risk when designing or adopting a system for ES certification. Established standards such as the Standard on Biodiversity Offsets and carbon offsets standards such as the Gold Standard or Verified Carbon Standard can be adopted for measuring, reporting and verification. For example, additionality and misleading claims are manageable risks that can be assessed using strong accounting and verification approaches that are developed by internationally recognized accounting standards such as ISO 14064-1, the WRI GHG Protocol or PAS 2050, and internationally recognized offset standards such as American Carbon Registry, CarbonFix, the Verified Carbon Standard, the Climate Action Reserve, the Gold Standard, and the Clean Development Mechanism. In addition, carbon offset credits can be retired in a traceable independent registry after they have been sold to ensure that those offsets are permanently matched against specific customer GHG emissions. The high costs of such requirements can pose a challenge for less developed countries and low income communities. However, investment in local training and financial support can help enable low income landowners to participate in PES programs and can also provide livelihoods in their communities.

Participation agreements for PES programs must be well delineated to prevent fraud and abuse including the provision of frameworks for rewarding conservation actions or outcomes, legal documents that are accessible at the local level, trade offs and synergies among multiple ES benefits must be accounted for in targeted payments and/or incentives, and measuring, reporting and verification (MRV) systems must be developed based on existing PES MRVs.[56]

[56] Forest Carbon Partnership. 2011. *Lessons Learned for REDD+ from PES and Conservation Incentive Programs: Examples from Costa Rica, Mexico and Ecuador*. http://www.forestcarbonpartnership.org/sites/forestcarbonpartnership.org/files/Documents/PDF/Dec2011/report_summary_eng.pdf [Last accessed 05.09.2014]

In order to address the risks and limitations of PES programs, a set of principles may be developed stating: the limits to what can be offset (wherein avoidance, minimization and on-site rehabilitation must be demonstrated); requirements that offsets are designed and implemented in a landscape context so that a full range of ecological, social and cultural values are considered; measureable conservation outcomes must achieve in situ no net loss and preferably a net gain of biodiversity; offsets must be additional and avoid displacing harmful activities harmful to other locations; include effective participation of stakeholders in decision-making; offsets must be equitable; and results of a biodiversity offset project should be reported in a transparent and timely manner.

The implementation of social safeguards, monitoring and evaluation of social impacts are tools that can be used to mitigate the potential negative social impacts of PES programs.[57] The major principles that can be utilized as safeguards to guarantee benefits sharing include: the involvement community stakeholders in decision-making on projects; the securement of land and civil rights; the establishment of efficient administrative procedures; implementation of transparency and dispute resolution procedures; and the establishment of mechanisms for monitoring, reporting and evaluation (MRV).[58] In addition, PES programs can promote the establishment of community-driven projects that enable full producer participation, the implementation of standardized projects' operations and procedures to reduce costs over time, programs to foster an understanding of ecosystem services and the regulations of a PES program, and investment in local training to reduce the need for external experts. These practices reduce investment risks, increase the involvement of local communities and produce positive social impacts associated with ES programs.

[57] Karumbidza, B., and Menne, W. 2011. *Carbon Sink Tree Plantations: A Case Study in Tanzania*. Timberwatch Coalition; Forest Carbon Partnership. 2011. *Lessons Learned for REDD+ from PES and Conservation Incentive Programs: Examples from Costa Rica, Mexico and Ecuador*. http://www.forestcarbonpartnership.org/sites/forestcarbonpartnership.org/files/Documents/PDF/Dec2011/report_summary_eng.pdf [Last accessed 05.09.2014]; Colchester, M., and Ferrari, M.F. 2007. *Making FPIC Work: Challenges and Prospects for Indigenous Peoples*. FPIC Working Papers. Forest Peoples Programme. Moreton-in-Marsh, UK.

[58] Karumbidza, B., and Menne, W. 2011. CDM Carbon Sink Tree Plantations: A case study in Tanzania. Timberwatch Coalition; Forest Carbon Partnership (FCP) 2011. *Lessons Learned for REDD+ from PES and Conservation Incentive Programs: Examples from Costa Rica, Mexico, and Ecuador*; Colchester, M., Ferrari, M.F., 2007. *Making FPIC work: challenges and prospects for indigenous peoples*. FPIC Working Papers. Forest Peoples Programme: Moreton-in-Marsh, UK; Steni, E. (ed). 2010. *Beyond Carbon: Rights – based Safeguard Principles in Law*. HuMA. Jakarta, Indonesia; Loft, L., Thu, P., and Luttrell, C. 2014. *Lessons from Payments for Ecosystem Services for REDD+ Benefit-Sharing Mechanisms*. CIFOR Infobrief 68.