

OPPORTUNITY COST ANALYSIS

Lessons learned from REDD+ and other conservation strategies

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What is Opportunity Cost Analysis?

Opportunity cost can be defined as the loss or sacrifice incurred by making a decision to take one action instead of an alternative action. Opportunity Cost Analysis (OCA) is the study of the potential benefits and risks associated with taking one action instead of the alternative action. OCA can be used to assess the benefits linked to deforestation that would be forgone by communities if they were to consent to a REDD+ project, compared to the benefits potentially conferred by the more sustainable land uses proposed under the project. In this case, the OCA is usually confined to the evaluation of traditional economic indicators such as the net present value (NPV) of the land, net revenues from agricultural land uses and profit margin. The use of economic concepts and models are relatively easy to apply to these kinds of assets. However, the need to also take into account non-monetary and non-tangible costs and benefits, such as ecosystem services and cultural values, make the true opportunity costs of REDD+ projects very challenging to accurately analyse and evaluate.

Why is Opportunity Cost Analysis important for conservation?

Opportunity Cost Analysis is often promoted in REDD+ projects for a number of reasons¹:

- The opportunity cost is thought to be the largest proportion of REDD+ costs i.e. the costs of avoiding deforestation.
- OCA provides insights into the drivers and causes of deforestation, with higher opportunity costs linked to higher deforestation pressures.
- OCA can help to identify likely impacts of REDD+ and other conservation initiatives on different social groups and hence inform project design and implementation. For example, if most of the cost is likely to be borne by marginalised groups, then project proponents need to identify strategies for avoiding or mitigating potential negative impacts. If opportunity costs are highest for politically powerful groups, these stakeholders may well try to hinder project implementation and in some cases may make the project unviable. In FFI's experience, those actors likely to gain financially or politically from conversion of forest to other uses have sometimes proven reluctant to issue licences that would enable ecosystem restoration and subsequent benefits from REDD+.
- In theory, OCA can help identify fair compensation levels for stakeholders that change their land use practices as part of a REDD+ or other conservation initiative. For example, where protected areas are established and local communities cannot gather non-timber forest products (NTFPs) or timber, OCA could provide an estimate of the additional cost of securing

¹ For further information see White, D and Minang, P (2011) *Estimating the opportunity costs of REDD+: A training manual. Version 1.3* World Bank Institute

those resources from other sources for household use plus the loss of income forgone if those resources would have been sold.

While neither the REDD+ **Climate, Community and Biodiversity Standards** (version 3) nor the **Plan Vivo Standard** (2012 draft) explicitly call for an OCA, both have requirements related to net social impact, informed consent and equitable benefit-sharing².

The **Verified Carbon Standard** (VCS) however does require an OCA to be carried out as part of its Agriculture, Forestry and other Land Use (AFOLU) Non-permanence Risk Tool. This is intended to demonstrate that the alternative land use scenarios used in the project are credible and substantiated within the project area in relation to the baseline scenario. Specific requirements under VCS include:

- OCA must include a NPV analysis of the alternative land use scenarios. This analysis should cover the project crediting period and take into consideration a conservative estimate of revenue from carbon credit sales and other project revenue streams, and potential price fluctuations of commodities impacted by the project.
- The financial discount rates³ used should be based on published sources and represent the appropriate risk for the relevant land use scenario.
- Estimates of prices for carbon credit sales should be based on published sources such as market intelligence reports.
- Where the majority of baseline activities over the length of the project crediting period are subsistence driven, an NPV analysis is not required. However, an assessment of the net impacts of the project on the social and economic well-being of the communities who derive livelihoods from the project area is still needed.
- The analysis shall be undertaken in a transparent manner and shall provide all relevant assumptions, parameters, and data sources such that a reader may reproduce the analysis and determine the same results

However, the VCS does not include guidance on how to account for non-monetary values when carrying out an OCA. This represents a serious challenge since in many forested areas intensive agricultural commodity production will almost certainly yield more dollars per hectare than a REDD+ project would if non-monetary or other less tangible values are excluded from the analysis.

How can we use Opportunity Cost Analysis in practice?

For REDD+ and other conservation projects, OCAs can be conceived at two different temporal and geographic scales:

- **An initial landscape-level OCA** carried out as part of a project's feasibility (or pre-feasibility) study. In this case, it would be used to compare the value of future REDD+ revenues (from carbon credits) to the most financially attractive land use option under a 'without-project scenario'. This is especially important for sites where industrial logging or conversion to commercial agriculture is a likely future scenario. This analysis would be a more theoretical and macro-level analysis taking into account pricing trends and projections from carbon credits, natural resources and agricultural commodities.
- **A second, participatory OCA** undertaken early on in project planning, as part of the process of collecting and analysing socio-economic baseline data on wealth, well-being, land uses and livelihoods. In this case, the analysis needs to enable project proponents and other

² See the papers in this series on Social Impact Assessment, Free, Prior and Informed Consent, and equitable benefit sharing.

³ A discount rate is an interest rate used to determine the present value of future cash flows. The discount rate should take into account not just the time value of money, but also the risk or uncertainty of future cash flows; the greater the uncertainty of future cash flows, the higher the discount rate.

stakeholders to better understand both monetary and non-monetary or more intangible costs and benefits of with- and without-project scenarios. In both REDD+ and other non-PES related conservation initiatives, this process should include an analysis of the costs and benefits of the project, including any direct financial revenues, ecosystem services and any capacity-building benefits from project interventions. This information is a key input to the FPIC⁴ process since community consent for project activities that would affect their lands and resources has to be based on an informed understanding of the potential costs, risks and benefits of those activities. Such analyses can be undertaken as part of social impact and threat assessments and include data on perceived values of goods and services by different stakeholders, as well as on their willingness to change how they manage their resources and any associated changes in their livelihoods strategies.

FFI believes that a nuanced understanding of opportunity costs and REDD+ project benefits, including those related to biodiversity and the maintenance and enhancement of ecosystem services, is a crucial element of making decisions related to REDD+. Taken alone, the financial income from sale of REDD+ credits may not be enough to directly offset opportunity costs related to NPV of land where industrial logging, mining, or conversion to commercial agriculture or plantations are likely alternative scenarios. However REDD+ payments, combined with the benefits derived from the protection of ecosystem services and cultural values, and capacity-building undertaken as part of a REDD+ project, may well outweigh the benefits of other land use options. Given the methodological challenges of quantifying non-monetary values and non-tangible benefits, FFI believes that the results of OCAs should not be taken as an accurate representation of the full range of opportunity costs of REDD+ or other conservation initiative, but rather used as one set of inputs into project feasibility studies and project design.

What challenges do we face and how have we tried to overcome them?

There are several challenges and limitations in carrying out opportunity costs analyses for REDD+ or other conservation projects:

- Opportunity costs are determined by a range of biophysical and socio-economic factors, such as soil fertility or market access. Hence opportunity costs can differ markedly for similar land use changes in different places within the same country or region. For example, research has shown opportunity costs for forest conversion to oil palm in Indonesia vary substantially depending on whether the forest is on peat or mineral soils⁵. For this reason, each project would need to undertake its own context-specific OCA rather than being able to apply the results from standard models for a particular scenario.
- Opportunity costs also differ between stakeholders. They are generally taken to be lower for those with fewer assets, such as poor smallholder farmers, who are assumed to be less able to invest in or benefit from conversion to more financially lucrative land uses. FFI teams have attempted to address this by using participatory methods to capture the diversity of perceptions that different stakeholders may have. However, there remain ethical issues related to the concept of poorer, more marginalised people 'deserving' less compensation for changing their behaviour precisely because they already have fewer options than more wealthy stakeholders.
- OCA may be inappropriate where stakeholders, such as women and men within local communities, do not really understand what they are potentially committing to or what their alternatives may be, or where tenure and resource use rights⁶ are unclear or contested.
- Opportunity costs are hard to estimate where resource users are largely operating outside well-functioning market systems, for example in areas of shifting cultivation or other primarily subsistence resource use. In terms of an incentive for land use change, it is the *perceived*

⁴ See the paper in this series on Free, Prior and Informed Consent

⁵ Irawan, S, Tacconi, L, Ring, I, (2011) *Stakeholders' incentives for land-use change and REDD+: the case of Indonesia* Working Paper #2, Asia Pacific Network for Environmental Governance, The Australian National University http://apneg.anu.edu.au/pdf/2011/wp_apneg_002.pdf

⁶ See the paper in this series on tenure and resource use rights

opportunity cost that affects behaviour change. In this context, the opportunity cost could be said to be extremely high for a farmer who believes that their family's survival is dependent on opening up forested lands to plant food crops.

- OCA may be inadequate to assess what compensations are needed to stop deforestation, such as when large-scale commercial activities result in deforestation, in cases where side payments (such as bribes or kickbacks) are made, or where decisions that lead to deforestation have been made for political reasons.
- Opportunities are dynamic and change over time meaning that costs and benefits may change considerably over the lifetime of the project. Changing social and political contexts, as well as local, national and international market trends can all affect the relative costs and benefits of different land uses, especially in cases where REDD+ projects are competing with agricultural commodities, timber or high-value mineral resources.
- When discussing risks, costs and benefits of REDD+ projects with communities and other stakeholders, project teams have to take into consideration not only **what** the potential impacts are likely to be but also **when** they are likely to occur. For example, there is likely to be a time-lag between required changes in resource management behaviour and corresponding financial revenues from carbon credits reaching those people who have made the changes. Similarly, the financial returns from forest conversion to oil palm **may** accrue to **some** stakeholders in the short term but hydrological changes impacting on water regulation, quality and supply, for example, may be felt by the same or other stakeholders over a longer period.
- Current NPV-based OCA tools do not take into account non-tangible and non-monetary costs or the perceived and future values of different stakeholders, including those of different groups *within* a community. Attempts to incorporate these costs in the analysis have proved very challenging. In theory, contingent valuation methods, such as Willingness to Pay (WTP), Willingness to Accept (WTA) and choice modelling, can be used to assess both use and non-use values. However, these methods are amongst the most controversial of non-market valuation methods since so-called 'stated preferences' (what people say they would do under a particular scenario) are often very different to what they actually do in practice.
- Some FFI teams felt that carrying out an OCA was an additional burden on limited project resources and questioned whether they had sufficient capacity in terms of time, skills and financial resources. One approach to deal with this challenge is to see OCA as part of the overall socio-economic context analysis required for good project design and management. OCA can be incorporated into other necessary processes including stakeholder analysis, and participatory development of the project's Theory of Change, associated Social Impact Assessment⁷ (SIA), design and FPIC processes.
- OCAs have different target audiences. For example, where decision makers such as governments, private sector investors or donors need to be convinced of the feasibility of a project at early design stage, a higher-level OCA can provide information on which to discuss some of the pros and cons of a particular intervention. However, a more in-depth, participatory process is required for an OCA that is to be used as the basis for an FPIC or SIA process.
- Opportunity costs are not the only costs of REDD+ projects. Transaction and implementation costs, including those incurred dealing with potential conflicts and grievances⁸, should also be taken into account when deciding on the viability of a project.

⁷ See the paper in this series on Social Impact Assessment

⁸ See the paper in this series on grievance mechanisms

Key References

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This document is one of a series of outputs from a learning event held in Cambridge in April 2013 to share experience, tools and lessons learned on the social aspects of REDD+ and other conservation strategies.

Topics discussed included: equitable benefit sharing; Free, Prior and Informed Consent; gender; grievance mechanisms; Opportunity Cost Analysis; Social Impact Assessment; sustainable livelihoods; and tenure and resource use rights.

All outputs are available to download from FFI's Livelihoods and Governance library:
<http://www.fauna-flora.org/initiatives/livelihoods-and-governance-library/#learning>



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