

Short title	<b>ICK KPI 8: Number of hectares where deforestation has been avoided through ICF support</b>												
Rationale	The aims of the UK's forest finance are to reduce greenhouse gas emissions from the forest sector, preserve bio-diversity and reduce poverty by reducing deforestation and forest degradation. This indicator will provide a broad measure of success against the headline forestry outcome of reduced deforestation of the world's forest land.												
Indicator Type	Annual change year on year in Hectares.												
Key reporting requirements	<p>Below is a list of key reporting requirements to keep in mind when making your returns. Further details are available in the text below:</p> <table border="1" data-bbox="427 618 1326 846"> <thead> <tr> <th data-bbox="427 618 735 651">Requirement</th> <th data-bbox="735 618 1326 651">Summary</th> </tr> </thead> <tbody> <tr> <td data-bbox="427 651 735 680">Available for reporting?</td> <td data-bbox="735 651 1326 680">Yes</td> </tr> <tr> <td data-bbox="427 680 735 710">Methodology changes?</td> <td data-bbox="735 680 1326 710">Yes</td> </tr> <tr> <td data-bbox="427 710 735 739">Units</td> <td data-bbox="735 710 1326 739">Hectares</td> </tr> <tr> <td data-bbox="427 739 735 768">Attribution</td> <td data-bbox="735 739 1326 768">Pro-rata share of public funding</td> </tr> <tr> <td data-bbox="427 768 735 846">Disaggregation to be reported in results templates</td> <td data-bbox="735 768 1326 846"> <ul style="list-style-type: none"> <li>• NA</li> </ul> </td> </tr> </tbody> </table>	Requirement	Summary	Available for reporting?	Yes	Methodology changes?	Yes	Units	Hectares	Attribution	Pro-rata share of public funding	Disaggregation to be reported in results templates	<ul style="list-style-type: none"> <li>• NA</li> </ul>
Requirement	Summary												
Available for reporting?	Yes												
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Technical definition/ methodology	<p>This indicator seeks to measure the change in forest area resulting from the ICF project relative to the counterfactual of what would have happened in the absence of the intervention. It will aggregate:</p> <ol style="list-style-type: none"> <li>a. the number of hectares where deforestation has been avoided;</li> <li>b. the number of hectares where afforestation or reforestation has taken place</li> </ol> <p>Since there are no readily available methods for calculating forest degradation, i.e. the reduction in forest quality, we do not expect projects to report degradation at present.</p> <p>Programme managers should in the first instance identify: (i) the geographical scope of programme (size and location of the area/ jurisdiction which the project will affect) <b>where possible</b> and (ii) the time-frame over which they expect the programme to have an impact (which may well extend beyond the delivery period).</p> <p>ICF analysts have identified a number of approaches which project managers can choose according to the type of project they are operating:</p> <ol style="list-style-type: none"> <li>1) Risk based method (developed by Ecometrica)</li> <li>2) Historic baseline</li> <li>3) Modelled baseline</li> <li>4) Control area</li> </ol> <p>All these methods have in common the following three steps:</p> <p><b>Step 1:</b> Establish the counterfactual: what land use would have occurred in the absence of the intervention? (this is the hardest part, more guidance below)</p> <p><b>Step 2:</b> Estimate the change in land use occurring in the intervention area/ target jurisdiction since the start of the intervention.</p>												

**Step 3:** Calculate the difference between counterfactual and intervention.

**Step 1: Establish counterfactual or reference level**

In practice **steps two and three are common to risk based, historic, or modelled baselines; it is only the approach to the counterfactual which differs.** The following paragraphs will briefly set out the three approaches and how they can be employed.

*1. Risk based approach*

Ecometrica have developed a risk based mapping tool which can be applied to calculate KPI 8 for geographically specific ICF projects. The method defines the counterfactual or reference level by dividing the intervention area into 30m by 30m squares and allocating each to one of the following risk levels:

<b>Risk Category</b>	<b>Brief Description</b>	<b>Expected loss within 20 years</b>
V. High	At immediate risk of loss - attractive and accessible with no effective protection	>80%
High	Accessible and attractive second choice land for cultivation and extraction, limited protection	60%-80%
Med	Some access, moderately attractive for cultivation or extraction or partially protected	40%-60%
Low	Difficult to access and not attractive for cultivation or extraction and/or fairly well protected	20%-40%
V. Low	Very difficult to access, little potential for cultivation or extraction and/or very well protected	Under 20%

Source: Ecometrica, *The Hectares Method*, table 2. Available [here](#).

The risk categories are based on a model that predicts deforestation is highest for areas which are Accessible, Cultivable, have Extractable value and are Unprotected. The model is therefore known as ACEU.

An example KPI 8 report delivered by Ecometrica and Embrapa in the Cerrado region of Brazil is set out in the Annex.

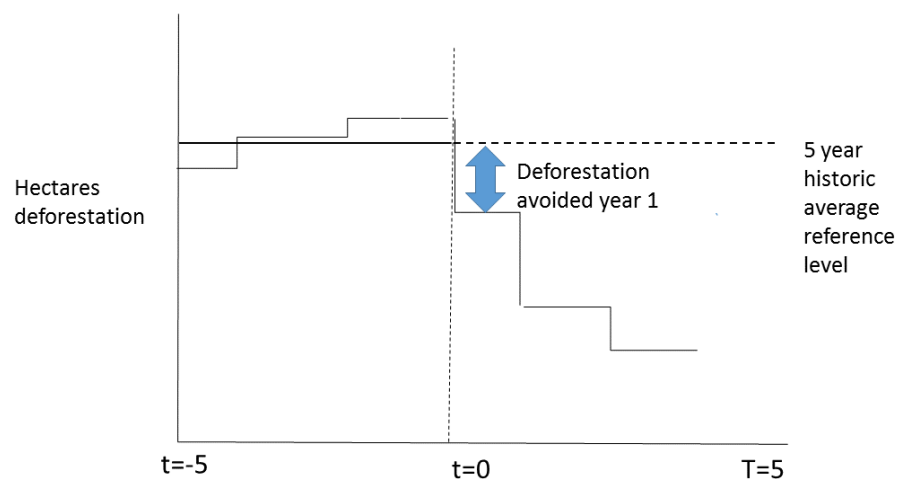
*2. Historic baseline:*

This method assumes the future will be like the past: the average deforestation for a number of years preceding the intervention is used to compare

deforestation during/ after the intervention (see figure 1). For some programmes a historic reference level is mandated due to the nature of the programme. More specifically, REDD+ programmes have an established precedent of reporting land use changes against a 10-year historic baseline.

Other projects which have historic data of five years at a minimum or 10 years if available and more representative for the intervention area may also choose to report against a historic baseline if they so wish.

**Figure 1: Example historic reference level**



### 3. Modelled projection baseline

A **modelled baseline** seeks to predict future deforestation in the project area/ jurisdiction by modelling the key drivers of land use change, for example population, economic growth, commodity prices and making predictions about what land use change will occur against which observed forest change can be recorded. We would not expect projects to use a modelled/ projected baseline for KPI 8 reporting but in exceptional circumstances, e.g. where project staff have particularly strong modelling/ analytical skills, it could be agreed in discussion with ICF project managers and analysts. As an example this is currently the case with Defra's Blue Forests Programme.

### 4. Control area

Another approach which could be considered is to have a **comparison or control area**: in this approach an area similar in characteristics (or different only through random variation) to the intervention area is compared over time to the intervention area<sup>1</sup>. This type of approach is typical in robust impact evaluation, but due to the extent of data collection and analysis required we would not expect it as standard for KPI 8 reporting **unless a project has designed in a quantitative Impact Evaluation at the inception of the project**, an approach

<sup>1</sup> As an example, see Jayachandran et al (2017) 'Cash for carbon: A randomized trial of payments for ecosystem services to reduce deforestation' *Science* Jul 21;357(6348): 267-273

which is highly desirable from a learning and evaluation perspective. A third party would normally be contracted to carry out the calculation as part of their evaluation and monitoring of the programme.

#### *Choice of approach*

The choice of counterfactual approach between options 1-4 for step 1 should be made considering analytical and practical considerations. ICF analysts can be consulted. All of the above approaches assume a project which has a spatially explicit target area where they expect to reduce deforestation. However this may not always be the case (e.g. for a green investment fund operating across multiple countries or even continents), in which case it may not be possible to report on KPI 8 at the aggregate level. Notwithstanding this, some projects may wish to report on spatial aspects of their programme using KPI 8, acknowledging that this may not capture the full breadth of their impact on deforestation.

#### **Step 2: Estimating deforestation during/ after the intervention**

This step requires data on forest change. Readily available satellite maps showing forest extent exist which vary in historic depth, regularity and granularity. An example is Global Forest Watch's online data tool which allows policy makers to analyse forest loss using a web-based tool<sup>2</sup>. Ecometrica have developed an online tool which draws on University of Maryland data to compare forest change. This tool can also be used to compare forest change using alternative map sources.

#### **Step 3: Difference between counterfactual and actual**

This is simply calculated by subtracting the change in forest area observed (step 2) from the reference level (step 1).

For multilateral programmes (e.g. the Forests Investment Programme, or Integrated Sustainable Forest Landscapes project) it will also be necessary to adjust the total number of hectares saved on a pro-rata basis and account for the UK/ ICF's contribution to the programme.

#### **Leakage**

This indicator as set out here does not actively measure or analyse leakage. For example, shutting down illegal logging in one region or country could simply displace companies to another area with weaker governance structures in place. For conservativeness, ICF appraisal guidance suggests that a 25% reduction can be made to account for the possibility of leakage. This can be flexed where for example the project is making specific efforts in this regard, such as the retiring mechanisms used in REDD+ programmes.

#### **Additionality**

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<sup>2</sup>

[http://www.globalforestwatch.org/map/3/15.00/27.00/ALL/grayscale/loss,forestgain,forest2000?tab=analysis-tab&begin=2001-01-01&end=2017-01-01&threshold=30&dont\\_analyze=true](http://www.globalforestwatch.org/map/3/15.00/27.00/ALL/grayscale/loss,forestgain,forest2000?tab=analysis-tab&begin=2001-01-01&end=2017-01-01&threshold=30&dont_analyze=true)

	<p>In principle, establishing a robust counterfactual should enable identification of what would have taken place in absence of the programme. However given that it is never possible to know this for sure (in the absence of time travel) and the possibility of multiple programmes operating in the target area it may be considered that an additional discount should be applied. Where the 'control areas' approach is used, an additional discount is unlikely to be necessary due to the robustness of this approach. However the final judgment on any level of additionality discount to apply should take into account the degree to which the counterfactual used appears to adequately reflect subsequent changes in the programme area and other interventions in the area. ICF appraisal guidance suggests a standard conservative figure of 50%, but this can be flexed in either direction.</p>
Country office role	As part of annual programme reporting, country offices and/or ICF analysts will be required to quality assure information provided.
Data source	<p>The data required depends on the method used:</p> <ul style="list-style-type: none"> <li>• For the Ecometrica risk based method, satellite data maps and risk analysis are provided by Ecometrica.</li> <li>• For a historic baseline, forest cover data for the target area for at least the last five years (and preferably 10) is needed.</li> <li>• For modelled options, demographic and/or socioeconomic data is required and will need to be obtained by/ through project partners.</li> </ul> <p>Ecometrica's forest mapping is based on the freely available University of Maryland dataset<sup>3</sup>. Another useful source of spatial information about forest cover and loss, also based on this dataset, is the Global Forest Watch monitoring tool which is user friendly and accessible; available <a href="#">here</a>.</p> <p>Country deforestation data is available from the FAO's Forest Resource Assessment datasets, which are released every five years<sup>4</sup>.</p>
Attribution	Where HMG are only funding part of the project, benefits (hectares) should be calculated as a pro-rata share of total project/ programme funding. For example, if we are funding 10% of a 1000 Ha conservation project, we should claim 100 Ha are attributable to HMG.
Return format	Hectares - total i.e. not abbreviated by thousands or millions
Data availability	Annual monitoring and evaluation reporting from relevant programmes (at a minimum the six identified above). See data issues section below.
Time period/lag	Programme managers should report the number of hectares where deforestation and degradation were avoided in the preceding year where possible. Alternatively best available data should be provided.
Quality assurance measures	We anticipate three layers of QA in DFID: country offices, CED and FCPD. Within country offices there may need to be consultation with other donors working in the forestry sector. Country offices are not involved in all DFID programmes.

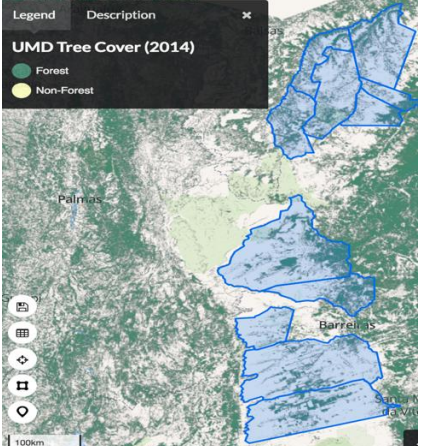
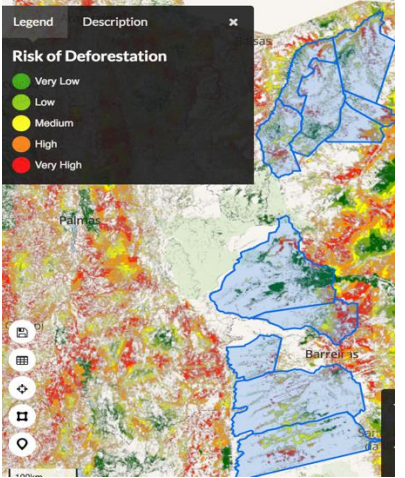
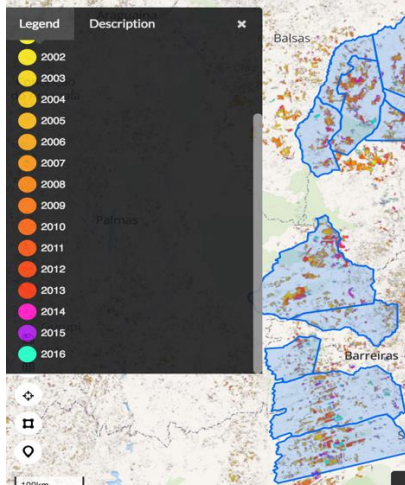
<sup>3</sup> <http://glcf.umd.edu/data/landsatFCC/>

<sup>4</sup> <http://www.fao.org/forest-resources-assessment/en/>

	<p>If reporting officers have any concerns about the quality of data or any points that they think CED should be made aware of, then please note this in the ICF (and DRF) results templates. Any comments can usually be added into the free text columns on the far right of each template. Further guidance should be available in the commissioning note.</p> <p>BEIS and Defra analysts will carry out QA on this indicator before data is passed on to DFID for aggregation.</p>
Data issues	<p>Some countries have better land use monitoring systems and forestry inventories in place than others (for example, Brazil is likely to be fairly sophisticated whereas the Democratic Republic of Congo will have relatively basic systems). <b>Data quality will therefore be variable.</b> However the use of satellite data can to some extent overcome these issues.</p> <p>All countries report to the FAO Global Forests Resources Assessment<sup>5</sup> in a standardised format. Data on the number of hectares classed as 'forest land' (FAO definition) should therefore be obtainable from national government sources. Again, data quality will vary from country to country.</p>
Additional comments	<p>This guidance was developed by Defra with review from BEIS and DFID analysts, and expert review from the Forestry commission.</p> <p>An additional indicator is being developed indicating the number of hectares of forest managed under a programme. KPI 6 (greenhouse gas savings) and KPI 10 (value of ecosystem services) will be calculated using output from KPI 8.</p> <p><b>In the future, we would like to improve this indicator by:</b></p> <ul style="list-style-type: none"> <li>• Working with international experts such as the FAO, World Bank Forests Investment Programme staff, World Resources Institute, and the Government of Norway to develop more sophisticated methodologies and improved national forestry inventories.</li> </ul>

<sup>5</sup> <http://www.fao.org/forestry/fra/en/>

**Annex: Example KPI 8 report for Defra Cerrado Project (Brazil) using Ecometrica Risk-Based Method.**

<p><b>Forest in impact area:</b> 1,678,415ha</p>	<p><b>Forest at Risk 2016: 'without policy scenario'</b> Expected loss: 43,471 ha</p>	<p><b>Forest Loss 2016: 'actual outturn'</b> Actual forest lost: 39,651 ha</p>	<p><b>Avoided forest loss 2016:</b> 3,820 ha =Expected – Actual deforestation.</p>
 <p><b>Description of forest types:</b> transition between savanna (cerrado) and dry forest (caatinga).</p> <p>Source: UMD Canopy Tree Cover, for 2000 Hansen et al. with of forest loss between 2001 and 2012 removed to update vegetation extent to 2012. Areas with a minimum canopy cover of 30% and minimum area of 1 ha according to Brazil definition of forests were extracted to give 2012 extent.</p>	 <p><b>Main drivers / risks:</b> conversion to agriculture, mainly mechanised, large scale.</p> <p>Sources: <a href="#">Morel et al (2015)</a>. Risk of deforestation map for cerrado areas in Bahia, Tocantins, Goias and Piaui; based on protection status of lands, threat of access to forests by road, cultivability and proximity to previous deforestation.</p>	 <p><b>Cause of loss:</b> conversion to agriculture</p> <p>Source: <a href="#">Hansen et al (2013), V1.4</a>. Forest loss accuracy assessment was carried out by <a href="#">Mitchard et al (2015)</a> and found to be of high accuracy for this area.</p>	<p>Actual forest loss for 2016 was approximately 4,000 ha lower than the risk-based reference level. The amount of forest loss decreased in 2016 compared to 2015. The amount of avoided forest loss has increased between 2014 -2016, from -263 ha in 2014 (assessment only covered the municipalities in Bahia, report available <a href="#">here</a>) to 3,820 ha in 2016.</p> <p>ICF intervention in this area enabled registration of over 14,000 small farms onto the CAR, which should encourage their compliance with the national forest code. The small areas of forest within these farms limits the potential impact of the programme at landscape level. Small farmers may still convert areas of forest to agriculture if they are above the 20% threshold, but should reforest if they are below. This is the first post-implementation reporting period, so some impact is expected.</p> <p>Contribution Score: low (given working with a subset of population) Percentage Attribution to ICF: 20%</p>
<p>The impact area comprises the 2012 extent of cerrado and caatinga vegetation within 6 municipalities of western Bahia. Much of the natural vegetation was cleared for agriculture between 1980 and 2000 (<a href="#">Batistella and Valladares, 2009</a>). The largest patches of remaining forest are officially protected.</p>	<p>The main drivers of forest loss are the expansion of large to medium scale farms growing soybeans, wheat, cotton and coffee. There has also been expansion of some urban areas. The areas at high or v. high risk are suitable for agriculture (rainfall &gt;1000 mm, moderate slope, and not formally protected). The areas at v. low risk were mostly within protected areas or on steep slopes.</p>	<p>Forest loss within the impact areas reduced slightly although there were some unexpectedly high losses of forest in the municipalities of Correntina (for both 2015 and 2016), Formosa de Rio Prieto (for both 2015 and 2016), São Desidério (for both 2015 and 2016), Baixa Grande do Ribeiro (only in 2016) and Luís Eduardo Magalhães (only in 2016).</p>	<p>To increase hectares of avoided forest loss in this region ICF investment should consider: &gt; targeting areas and actors with influence over larger areas of forest at risk; &gt; incentives or measures to encourage retaining areas of forest above the minimum legal threshold.</p>

