orbify

How to Screen and Develop ARR Carbon Projects Faster 2025

Move beyond industry standards with real-time quality monitoring and instant additionality analysis.

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The Carbon Market and ARR

Carbon markets enable the trading of carbon credits, each representing one ton of carbon dioxide or an equivalent greenhouse gas, to offset emissions. These credits, generated through reforestation, renewable energy, and sustainable infrastructure projects, help companies and individuals compensate for unavoidable emissions. By creating financial incentives for emission reduction efforts, carbon markets support global climate goals, particularly in regions with limited resources. As demand grows, these markets continue to evolve, playing a vital role in funding sustainable projects and advancing climate action.

Forestry carbon projects are essential for both avoiding carbon emissions and removing carbon from the atmosphere. They fall into three main categories: ARR (Afforestation, Reforestation, and Revegetation), REDD+ (Reducing Emissions from Deforestation and Forest Degradation), and IFM (Improved Forest Management). Each category focuses on different aspects of forest management and carbon sequestration. **This guide focuses on ARR projects.**

Afforestation, Reforestation, and Revegetation Projects:

ARR projects play a crucial role in carbon removal, as forests act as natural carbon sinks, capturing significant amounts of CO_2 as they grow and mature.

Afforestation involves planting trees on land that has been treeless for an extended period or possibly never had forests.

Reforestation restores tree cover in recently deforested or degraded areas.

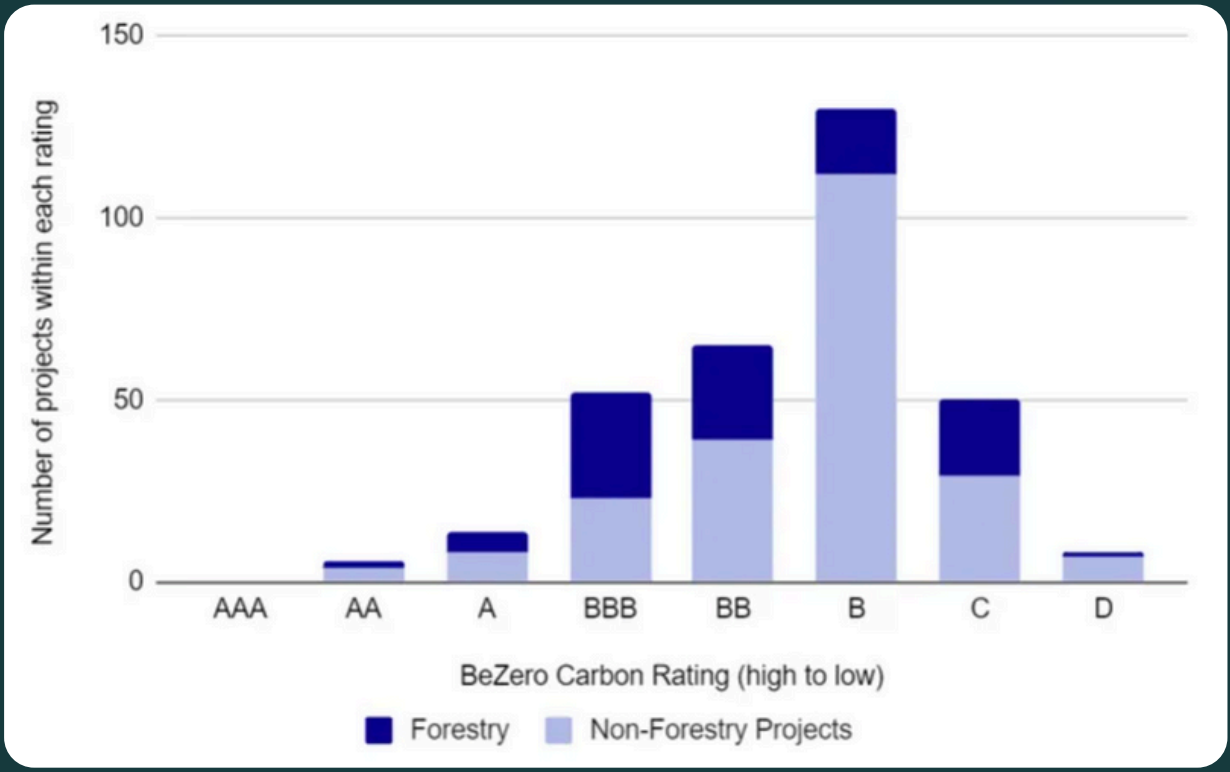
Revegetation promotes natural plant growth on damaged land.

Current Market Context for Forestry Credits

The global voluntary carbon market (VCM) held a value of over $2 billion in 2024, and could be worth between $5-30 billion per year by 2030.

The World Economic Forum estimates that Nature-based solutions (NbS) can provide up 30% of the mitigation needed to limit global warming to 1.5°C above pre-industrial levels by 2030. **At the current stage, forestry credits dominate the NbS sector,** making up 88% of total credits issued as of 2023. With 661 million forestry credits issued (June 2023), the sector is the VCM's backbone.

As of July 2023, the carbon rating agency BeZero rated the majority of forestry projects BBB, indicating a moderate likelihood of avoiding or removing one ton of CO_2e. Assigned ratings range from AA, signifying a very high likelihood, to D, representing a very low likelihood.



Source: Ratings distribution of BeZero Carbon Ratings for forestry projects and non-forestry projects, July 2023

Current Market Context and VM0047

The VCM is evolving to prioritize **high-quality** projects, with increased scrutiny placed on project claims around **risk**, **additionally**, and **co-benefits.**

Buyers are increasingly seeking projects that offer not just carbon reductions but also social and environmental co-benefits like job creation and biodiversity protection. This shift reflects a maturing market focused on accountability, robust monitoring, and the long-term impact of forest restoration efforts.

Concerns over the effectiveness of some credits have been a major focus, influencing broader market perceptions of forestry projects and the overall integrity of the VCM. However, a recent driver for credit demand are changes to a **key methodology introduced by Verra**, the market's largest accreditor, which have largely been regarded improvements.

Verra's Methodology VM0047 at a Glance:
Verra's significant effort to consolidate several similar methodologies for ARR and REDD+ projects, resulting in VM0047 (ARR) and VM0048 (REDD+), signified major revamping of to these methodologies' approaches toward calculating additionality and leakage.

Verra's VM0047 introduces dynamic baselines, a definitive common practice benchmark, and clearer leakage monitoring guidelines, enhancing the robustness of carbon accounting and efficacy of ARR projects. Approved by the ICVCM under its Core Carbon Principles (CCPs) quality label, VM0047 provides a scientifically robust approach for projects removing carbon from the atmosphere through tree planting or restoration and is expected to bolster the integrity of reforestation initiatives and strengthen market confidence in ARR carbon credits.

Overview of Verra's VM0047 Methodology

Verra's VM0047 methodology, introduced in September 2023, represents a significant step forward for ARR projects. It aims to enhance the credibility and impact of reforestation projects. Here is a rundown of its improvements, strengths, and remaining challenges.

Dynamic Baseline Approach:
Dynamic baselines calculate the project's baseline (the business-as-usual scenario) ex-post (after the project has started). This signifies a departure from previous methodologies which used projections based on historical data, or no baseline at all. Dynamic baselines, when done correctly, are widely accepted to be the best way to reflect the true additionality of a project, since the baseline will better reflect the dynamic and variable nature of the business as usual scenario which can change dramatically as the result of changing policy for example.

Strengths of VM0047:
Dynamic baselines are often used by researchers and ratings agencies to review claims made by projects regarding additionality, and employing these methods to issue credits will likely boost confidence in the market. It is likely that carbon credits issued from ARR projects will be higher quality. It may now be easier to replicate these baselines so that claims are easier to scrutinize, as baselines may previously have been hidden within project design documents (PDDs).

Room for improvement:
It is still possible to manipulate dynamic baselines and construct them ineffectively or inaccurately. There may still be enough wiggle room in the methodology to allow some low quality carbon credits to enter the market. Questions over the usefulness and reliability of the 'stocking index', a vegetation index used to monitor and compare the project to surrounding areas, may require developers to be more cautious in the application of this methodology, to avoid underselling their projects. Some updates may be published by Verra which help project developers create baselines with more clarity and confidence.
Ex-post baselines may create better quality credits, but planning has now become harder for new projects, where credit issuance is more dependent on changing policy conditions and the actions of the neighboring regions. With this methodology being new, there are still lessons to be learned along the way of course.

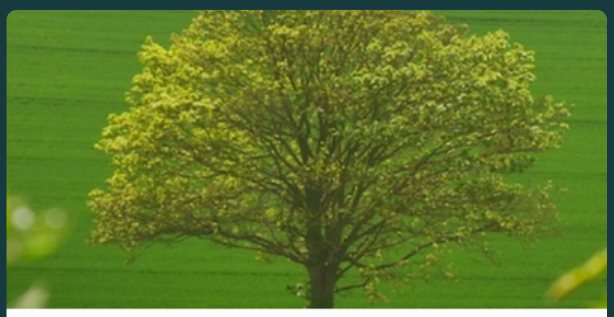
Overview of Verra's VM0047 Methodology

Factor	AR-ACS0003 and AR-AMS0007	VM0047
Baselines	Both methodologies employ alternative scenario analysis, which identifies the most likely scenario in the absence of the project, and uses that to set the baseline.	Offers two approaches: **Area-based**: Employs traditional plot-based sampling methods in matched control plots outside of the project area, in combination with remote sensing data, to establish a project's baselines. **Census-based**: Primarily designed for projects where the activity does not result in a change in land use, such as agroforestry, and where a complete census of plantings is practical.
Additionality	Both AR-ACS0003 and AR-AMS0007 demonstrate additionality through barrier, investment, and common practice analysis, or an approved standardized baseline appropriate to the project.	Additionality testing depends on the baseline setting approach. However, both approaches require regulatory surplus tests, plus an investment analysis when there are revenues/financial incentives other than carbon credits. **Area-based:** Must exceed the carbon storage that is evidenced from the same dynamic performance benchmark that is used in the baseline setting. **Census-based**: Must occur in lands with less than 10% forest cover and subject to continuous cropping, in settlement(s), or on lands categorized as 'other lands'. Projects must also apply a common practice assessment which considers anything over 15% to be common practice.
Leakage	Leakage for both methodologies is estimated using the CDM tool AR-TOOL15. The tool estimates the increase in emissions based on changes in carbon stocks in the affected carbon pools in the land receiving displaced activities. It considers increases in GHG emissions associated with secondary effects to be insignificant and therefore they are not accounted for. This tool does not stipulate time spans from and for which leakage assessment must be derived or applied.	Requires projects to apply the newly published leakage module VMD0054. This provides a standardized approach to accounting for leakage associated with displacing pre-project agricultural activities caused by the baseline agent or other actors. It incorporates a set historical period of three years or one crop rotation, whichever is greater, and quantifies leakage for five years following project establishment.
Carbon pools	In AR-ACM0003 and AR-AMS0007, accounting for deadwood, litter and soil organic carbon pools is optional, whilst non-woody biomass is not included.	In the area-based approach litter and aboveground and belowground non-woody biomass must be included if the project activity significantly reduces these carbon pools. Soil organic carbon must be included where soil disturbance from the project activity occurs more than once during the crediting period, and/or when it involves soil inversion to a depth exceeding 25 cm.

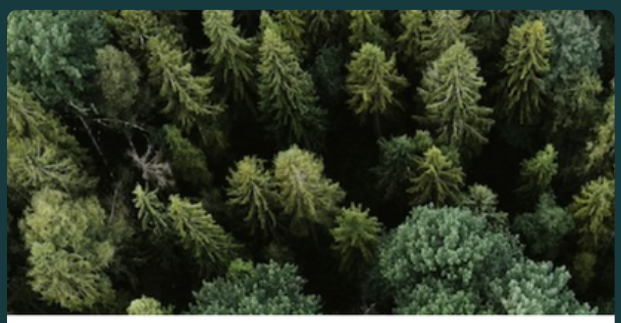
Source: Assessment of Verra's new VM0047 ARR methodology, BeZero

Orbify's ARR Templates

Orbify's templates streamline the assessment of your project's impact, additionality, and risks, combining real-time monitoring and instant analysis. These templates help you to pursue high-integrity projects and examine your project's alignment with the most recent industry standards.



ARR - New projects (< 5 years old)



ARR - Existing projects (> 5 years old)

Flexibility and User-Friendliness:
Orbify offers two different templates with very similar structures to fit specific user needs.

The **New Projects Template** template is specifically designed for carbon projects that have been **active for less than 5 years or are about to begin.** The goal of this analysis is to verify if the project is will be additional and feasible with a focus on VM0047 and additional high-quality criteria.

The **Existing Projects Template** assists you in monitoring carbon projects that have been **active for more than 5 years.** The main focus of this template is additionality thanks to the performance benchmark chart introduced with VM0047.

The distinction is made because the requirements for new projects differ in many key ways from projects through which trees and vegetation have already become established.

This guide uses the New Projects Template, but further information on the distinction between the Existing Projects Template can be accessed on page 18 and in our 2024 ARR Projects Guide.

Features and Benefits of Orbify's ARR Project Template

VM0047 Alignment and Beyond:
Orbify's ARR templates are designed to provide users with automated reports for areas which are undergoing afforestation and reforestation. The template follows many of the steps outlined in Verra's **high-integrity methodology** VM0047, which is likely to be the most commonly used methodology for ARR projects in the future.

On top of that, **our template provides tools which go beyond VM0047s requirements** so users are able to identify any potential hazards at the project design stage and indicators which will allow users to demonstrate high-quality.

Please note *that it is not currently possible to fully automate the Performance Benchmarking analysis of VM0047 to obtain a compliance result, especially for new projects.* ***Reach out to Orbify if results need to be Verra Compliant.***

Additionality:
Additionality is vital in ARR projects because it ensures that the carbon sequestration benefits would not have occurred without the project's intervention. If a project lacks additionality, it means the land would have been reforested or revegetated naturally, rendering the carbon credits ineffective.

For investors or buyers, high additionality guarantees that their purchase will lead to genuine climate impact, enhancing the credibility of the credits and protecting against reputational risks. Projects with strong additionality contribute to meaningful environmental and social benefits.

Features and Benefits

Instant Project Overview to Approach Alignment:
Within seconds, our ARR template provides a comprehensive description of your project detailing exact total project area, location, defining the project's ecoregion and biome, and - relevant in the case of multi-polygon analysis - the size of the largest contiguous area within the project. The template can indicate if you meet the most critical eligibility and monitoring criteria based on the VM0047 methodology.

1. Project Description

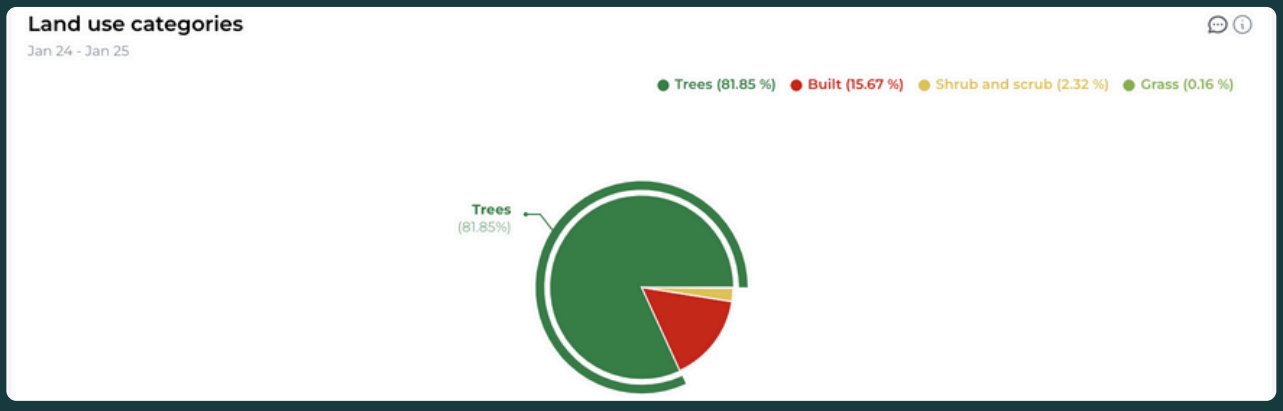
This section provides a short overview of the project's characteristics and progress.

This **1,230.90 hectare** project is located in the **Eastern** administrative unit of **Kenya**,
within the **East African montane forests** ecoregion, which is part of the **Tropical & Subtropical Moist Broadleaf Forests** biome.
VM0047 Requirement: The project must produce a continuous change in forest cover greater than 1ha

Total area: **1,230.90** hectares.

Largest contiguous area: **1,230.90** hectares.

Precise Area Analysis for Viability Assessment:
In addition, instant high resolution imagery analysis enables you to quickly assess land use types within your project area.

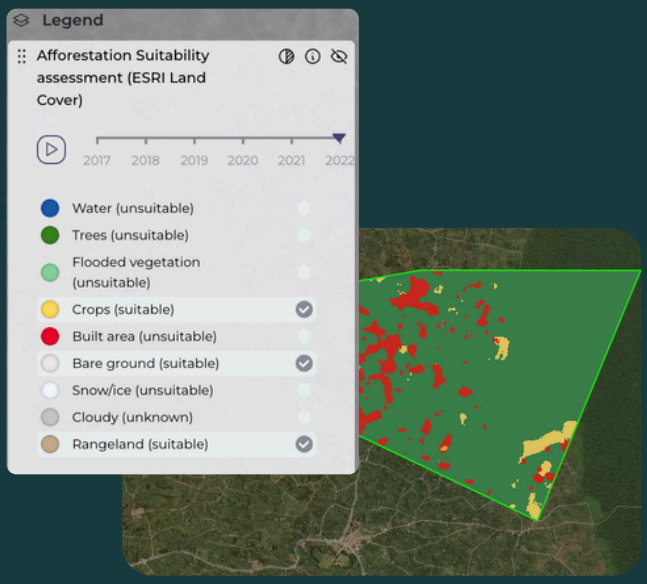


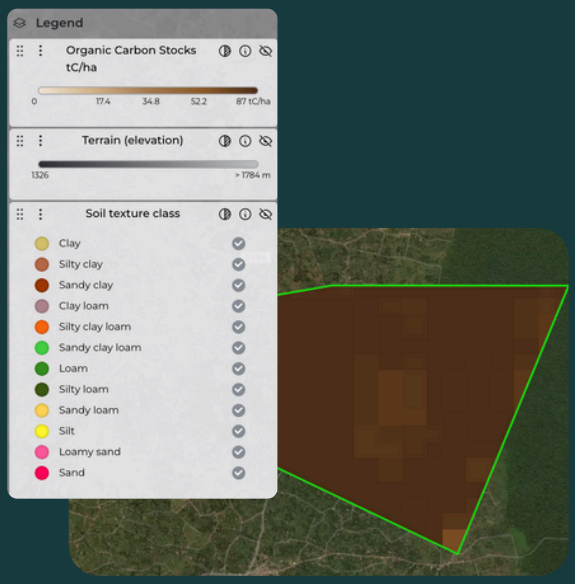
Features and Benefits

Ground and Soil Insights to Ensure Quality and Avoid Risk: The template illustrates which land within your project area may be suitable for ARR projects based on ESRI land cover class. In general, crops, bare ground, and rangeland fit this requirement.

Our template also assesses soil carbon stock and soil texture along with terrain slope to reflect on-the-ground conditions accurately. Soil carbon stored in soil organic matter plays a pivotal role in sequestering carbon above baseline scenarios.

This information, based on the USDA classification system, helps you select the appropriate species to use for reforestation to suit the local environment. This data is critical for maximizing reporting accuracy and mitigating carbon reversal risks.





The following soil characteristics exceed the local average: **clay content, nitrogen, Soil Carbon** The following soil characteristics are less than the local average: **sand, pH**

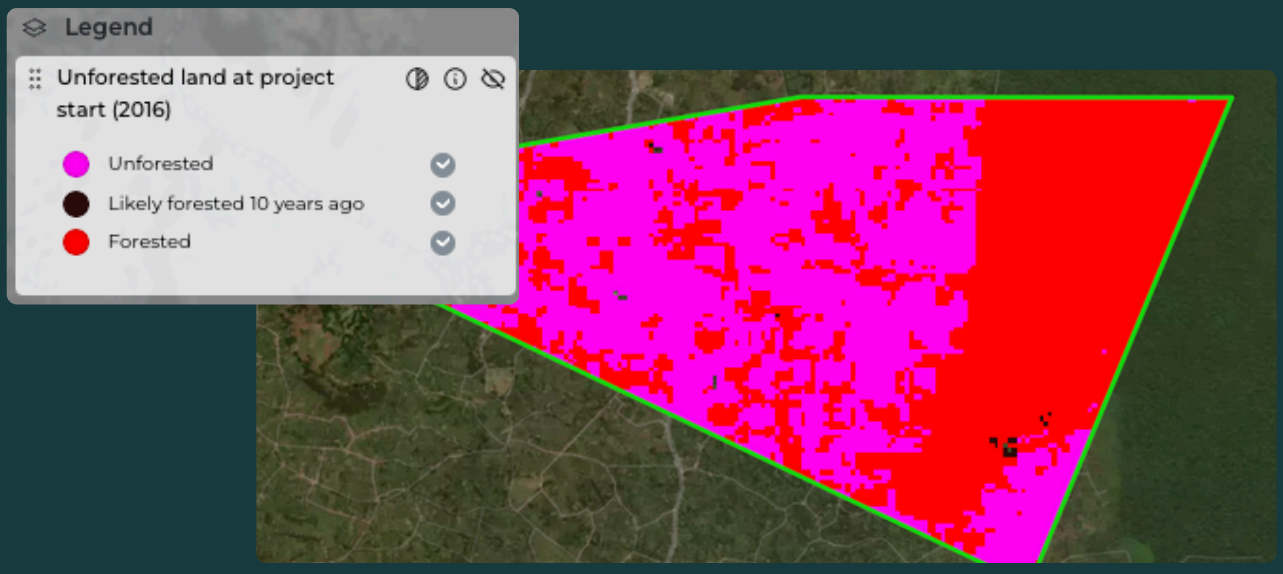
Features and Benefits

Historic Site Assessment to Gage Viability:
Ensure at first glance that land has not been cleared of native forest within the last 10 years to **meet eligibility criteria** and determine if the site is viable for a new ARR project.

Previously forested areas may be considered plantation-schemes, and may therefore not be additional. This is why historic site assessment is crucial for those wishing to demonstrate a high quality project.

Our template identifies those areas which have remained unforested for 10 years, those that have been cleared of forest within 10 years of the project start date, and those which were forested at the project start date.

For instant clarity, our plantation risk tool indicates the likelihood that the plot was previously forested and may thus be considered non-additional.

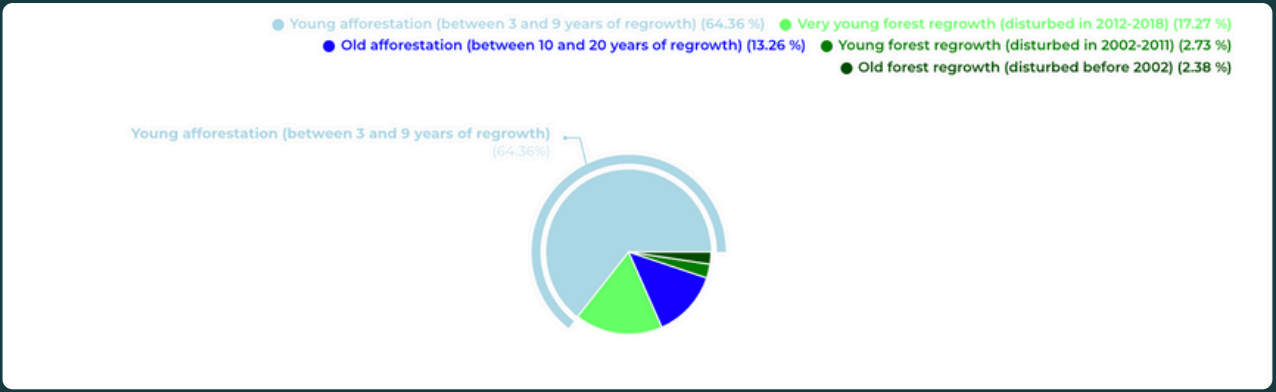


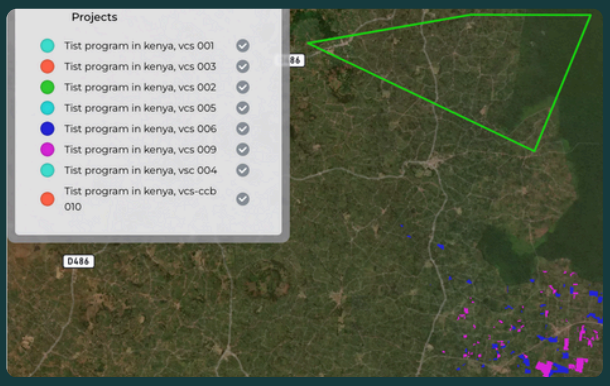
High risk the plot was partially forested within past 10 years
PLANTATION RISK

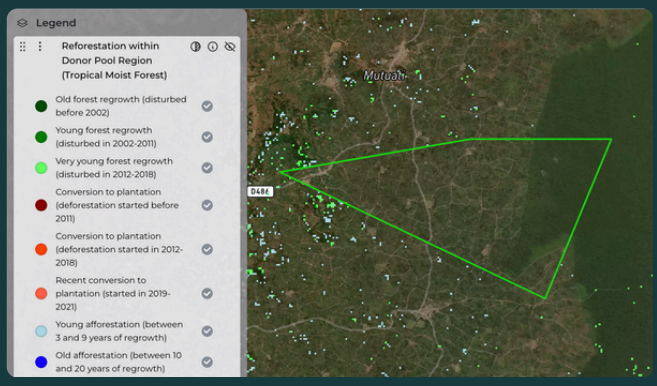
Features and Benefits

Common Practice Overview:
With our template you can easily compare your project area with the surroundings to assess if it would change the local ARR status quo to make a positive impact, in other words if it is additional.

The VM0047 Rapid Assessment - Common Practice Risk component flags areas with a high rate of forest growth in the surrounding area as high risk for the project having a non-zero performance benchmark. This is important because projects within regions of high levels of afforestation or regeneration may have to provide more evidence that activities can be additional.







Risk that project activities may not exceed common practice: Medium
ANNUAL REFORESTATION RATE: 1156 HA/YEAR

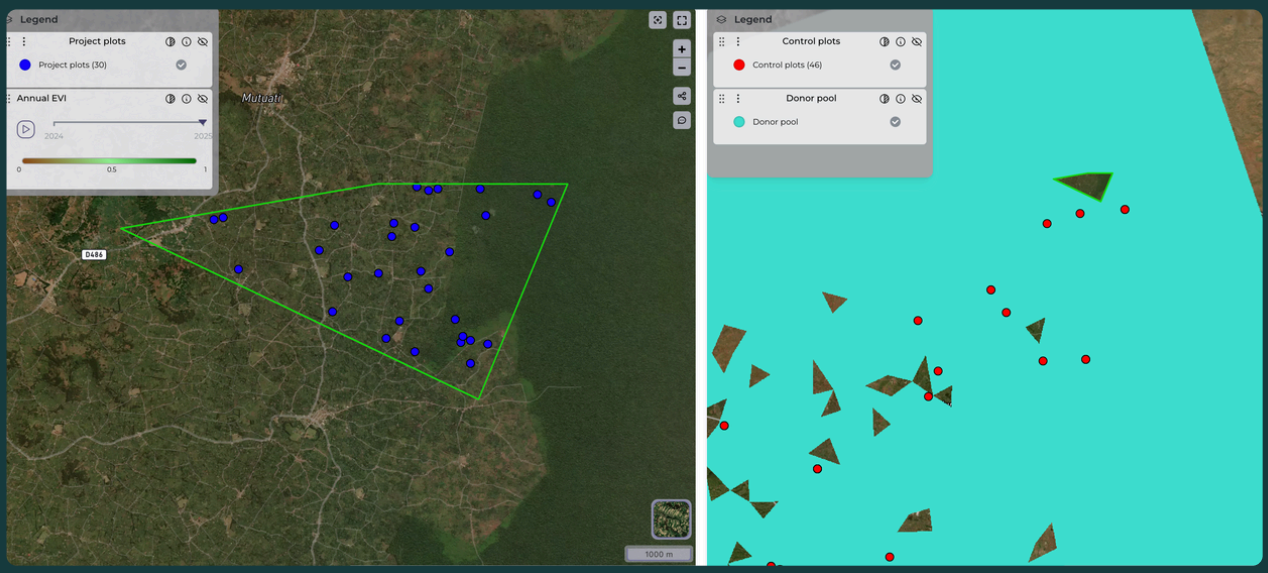
Features and Benefits

Comprehensive Benchmark Analysis for Effectiveness:
With Orbify's Performance Benchmark Analysis, you can see at first glance if your project is likely to make a significant difference when compared to local vegetation changes.

We use specific stocking indices to compare vegetation growth and health within a polygon to its surroundings, allowing precise and easily understandable control plotting.

These functions serve as an easy reference scenario representing what would occur without a carbon project.

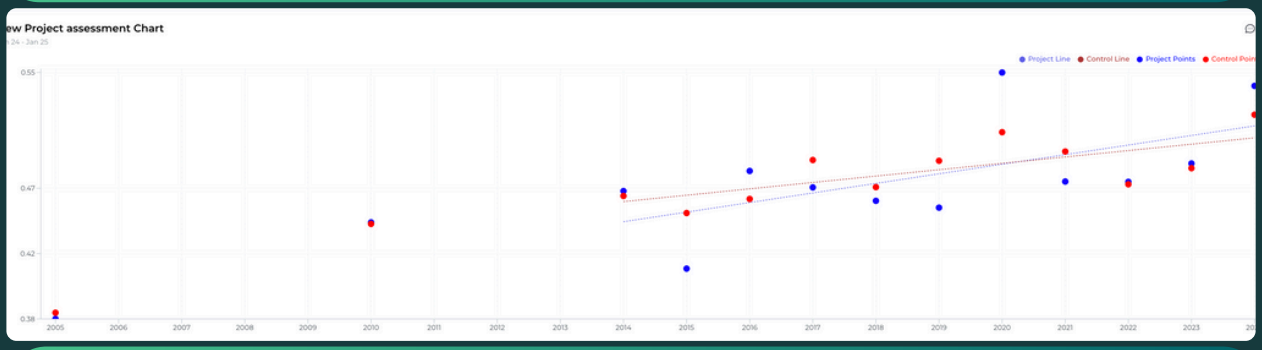
Dynamic Baselining for Real-Time High Quality Assurance:
Orbify employs dynamic baselining to calculate the additionality of a project. Using real-time remote sensing data from comparable areas outside the project boundary, we establish an objective and transparent reference scenario for evaluating project performance. Conditions are continuously updated based on real-world remote sensing data instead of being fixed at project inception.



Features and Benefits

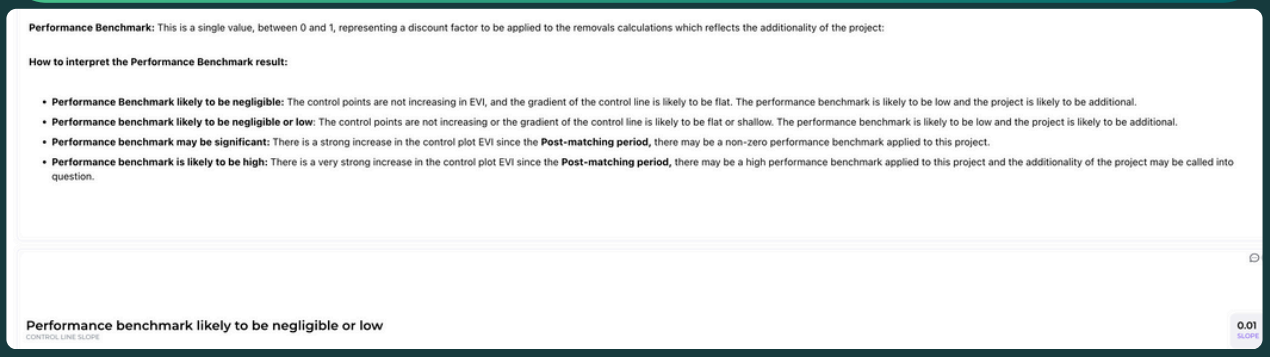
Refined Quality Control through Performance Benchmark:
For new projects, Orbify implements a more rigorous performance benchmark than VM0047 suggests, based on a historic assessment of stocking indices over 20 years rather than just 10 years for **additional control and certainty.**

As a result, the New Project Assessment Chart simulates a start date 10 years earlier to allow sufficient time for control and project plots to diverge. This creates a clear performance benchmark by analyzing the control plot's trend over the simulated period.



Project Design Document (PDD) Support:
The New Project Performance Benchmark Estimation tool is designed to help users forecast a performance benchmark for new projects. If found 'negligible' or 'low,' projects will likely be additional. If 'significant' or 'high,' projects's projects may not be additional.

This information is required in order for credits to be issued. All carbon projects issue credits based on the difference the projected baseline and the actual observed changes in biomass. If you are running a feasibility study, being able to demonstrate your project's additionality for your PDD is one of the most essential steps to meet ARR compliance.


Performance Benchmark: This is a single value, between 0 and 1, representing a discount factor to be applied to the removals calculations which reflects the additionality of the project:

How to interpret the Performance Benchmark result:

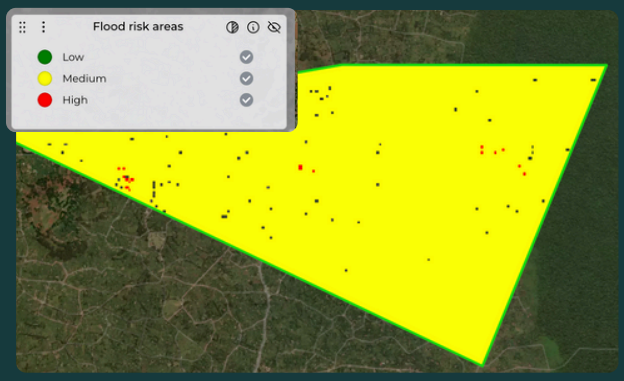
- **Performance Benchmark likely to be negligible:** The control points are not increasing in EVI, and the gradient of the control line is likely to be flat. The performance benchmark is likely to be low and the project is likely to be additional.
- **Performance benchmark likely to be negligible or low:** The control points are not increasing or the gradient of the control line is likely to be flat or shallow. The performance benchmark is likely to be low and the project is likely to be additional.
- **Performance benchmark may be significant:** There is a strong increase in the control plot EVI since the **Post-matching period,** there may be a non-zero performance benchmark applied to this project.
- **Performance benchmark is likely to be high:** There is a very strong increase in the control plot EVI since the **Post-matching period,** there may be a high performance benchmark applied to this project and the additionality of the project may be called into question.

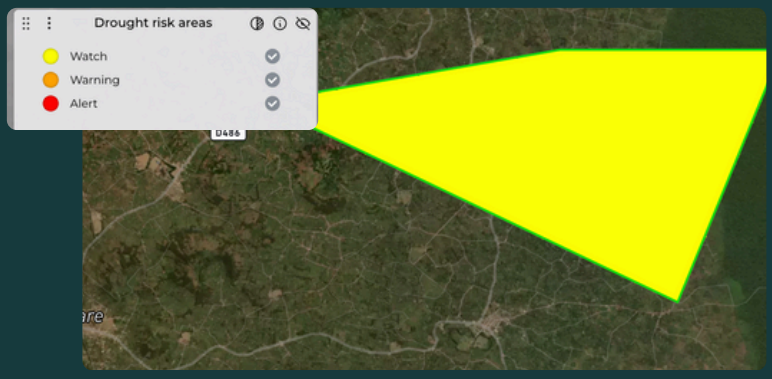
Performance benchmark likely to be negligible or low
CONTROL LINE SLOPE
0.01
SLOPE

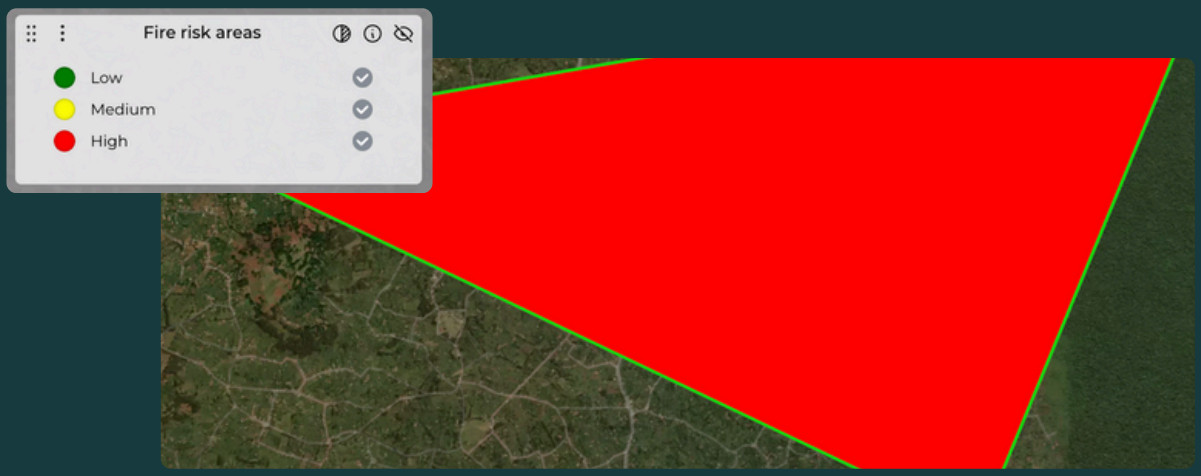
Features and Benefits

Natural Risk Assessment and Planning:
ARR projects face significant risks from natural disasters and hazards which can release stored carbon back into the atmosphere.

The Non-Permanence Risk Score indicates **what percentage of your carbon stocks might be at risk** from fire, drought, or floods, while our Non-Permanence Summary yields critical information about how much of your project area is **at risk from which kind of hazard**. These assessments help you mitigate risks, ensuring project sustainability. Mitigation strategies include selecting resilient tree species, implementing fire prevention measures, and detecting threats early to protect long-term carbon storage.



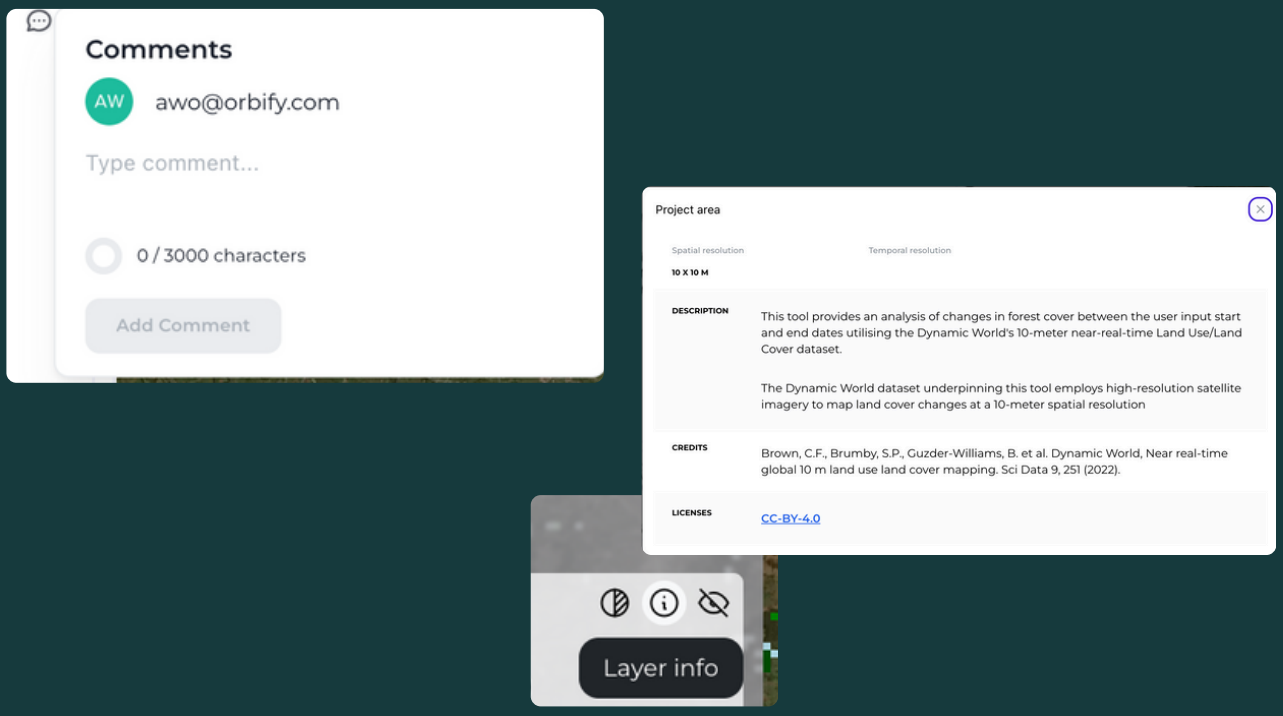




Features and Benefits

Transparency With a Simple Click:
Further information such as description of tools, detailing their purpose, data sets, licenses, or publication, and creation credits can be accessed throughout the entire ARR Project Template with a simple click of the information button.

Collaboration at Every Turn:
At any point in their project monitoring process, users may wish to collaborate. Orbify facilitates this effort by equipping every segment of its ARR Project template with comment functions that allow users to leave notes exactly where they need to, at any given step in their monitoring process.



Orbify's Existing ARR Projects Template

The **ARR Existing Projects Template** follows a similar structure to the New Projects Template.

A key distinction is the inclusion of a **Site Condition Assessment** in the New Project Template, which focuses on soil and terrain characteristics, rather than a Site Suitability Assessment.

Additionally, the Performance Benchmark ensures project eligibility by confirming that the land has not been cleared of native forest within the past 10 years.

The Common Practice Chart summarizes local afforestation and regeneration data, while the Common Practice Tool assesses regional afforestation levels as low, medium, or high.

Another key difference in the Existing Projects Template is that it includes an estimate of the expected additionality for an ongoing project, while the New Projects Template provides an estimate of the additionality of the project.

Lastly, consistency in the two templates' identical non-permanence sections, ensures that non-permanence risks are uniformly assessed across both templates.

Thank you!

If you're looking to effectively **manage your ARR projects**, Orbify offers a comprehensive satellite-powered solution!

Our platform offers insights into your projects, ensuring the success and quality of your ARR initiatives while streamlining carbon project management.

Ready to get started? Contact our experts today to learn more!

Schedule a call with our experts!

Website
www.orbify.com

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