

# RCF Cerrado Programme 1

## Monitoring methodologies used by SIM, BVRio and Earth Daily

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### 1. Internal monitoring conducted by SIM and BVRio

The teams of SIM and BVRio are responsible for screening farmers and farms for compliance with the eligibility criteria throughout the programme cycle.

At the pre-contract stage, SIM-BVRio conduct the following analysis:

- spatial analysis of farms selected to identify deforestation or conversion of native vegetation since 2008 and after 2020 using ArcGIS and Landsat images taken at different times in the crop season;
- location of the farm with relation to vegetation type and biome;
- determination of areas of native vegetation, cleared areas and areas of crop cultivation;
- potential overlaps with indigenous, community or quilombola lands;
- potential overlaps with conservation areas;
- verification of possible infractions of other environmental legislation associated with farmer's tax IDs (CNPJ/CPF), using BVRio's Due Diligence & Risk Assessment System<sup>1</sup> that continuously monitor 20 databases of compliance with different legislation. This system uses advanced analytics on a combination of real-time production data, consultation to external databases (SICAR, IBAMA, state environmental agencies, Ministry of Labour, etc.), documental and satellite imagery analyses (MapBiomias). This internal due diligence system was adapted from BVRio's Due Diligence and Risk Assessment tools<sup>2</sup> developed for the timber sector, which uses big data analysis and blockchain encryption<sup>3</sup>.
- Infringements of labour legislation are monitored by SIM using the Brazilian Ministry of Labour and Social Security database of employers who breach legal requirements, including subjecting workers to conditions analogous to slavery<sup>4</sup>.

Determination of compliance with the Forest Code is a particularly challenging task, given that there is no official confirmation provided by government authorities and the data reported in the CAR is self-declared and not validated by the relevant environmental agencies.

For this reason, SIM conducts its own analyses to determine likelihood of compliance, based on the amount of native vegetation observed in the CARs and whether this satisfies the theoretical requirements of the law. All this analysis is conducted using satellite imagery, as explained above.

SIM's analysis takes into account the data self-declared in SICAR. However, the quality of declarations is highly varied, and it is often the case that the numbers declared do not match the areas in the

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<sup>1</sup> <https://www.bvrio.com/madeira/analise/cadeiaCustodia/dashboardDueDiligence.do>

<sup>2</sup> [www.bvrio.org/timber](http://www.bvrio.org/timber).

<sup>3</sup> See BVRio, 2016: Using big data to detect illegality in the tropical timber sector. [www.bvrio.org/publicacoes/](http://www.bvrio.org/publicacoes/)

<sup>4</sup> [https://www.gov.br/trabalho-e-previdencia/pt-br/composicao/orgaos-especificos/secretaria-de-trabalho/inspecao/areas-de-atuacao/cadastro\\_de\\_empregadores.pdf](https://www.gov.br/trabalho-e-previdencia/pt-br/composicao/orgaos-especificos/secretaria-de-trabalho/inspecao/areas-de-atuacao/cadastro_de_empregadores.pdf)

polygons drawn in SICAR, or the boundaries and locations of legal reserves and APPs are incorrect or inappropriate, requiring case by case interpretation.

The process of determination of legal reserve compliance starts with the area of native vegetation observed within the polygon declared in SICAR. If this area is sufficient for the requirements of the law for the Legal Reserve (20% or 35%, for the Cerrado areas of the RCF), the farm is considered preliminary compliant with this requirement, pending analysis of APPs.

For the calculation of APPs, SIM used the number self-declared in the CARs, both in figures and in the polygons drawn in the CARs. The area declared and the area drawn in the map are often different. In case of discrepancies, when the visual and GIS analysis provided a clear delineation of the APP area, these results were used. Otherwise, we considered the highest figures.

If farms contain sufficient area of native vegetation to include both legal reserves and APPs, compliance with these two categories is considered satisfied and any remaining native vegetation is considered “excess legal reserve”. If farms do not contain native vegetation to include both legal reserves and APPs, the APPs are considered part of the legal reserves, as per Article 15 of the Code.

The analysis of native vegetation was based on groups of CARs that, in aggregate, satisfied the spatial requirements of the Forest code. This is particularly relevant as, in many cases, these CARs were originally part of a single farm in an estate that was segmented during generational transfers. In some cases, this may create situations where the individual CAR is not in compliance with the vegetation requirements of the Code, and the landowner has to enter into a PRA to rectify it. In these cases, considering that during the rectification process the native vegetation of the farm would be below the legal requirements, SIM requires the farmer to submit additional areas of native vegetation to the protection of the RCF. So, without prejudice to the correction measures to be taken under the Forest Code requirements, the total area of native vegetation protected by the RCF is not affected.

Throughout the crop season, SIM relies on Earth Daily’s monitoring reports that provide early warning of any factor that could potentially affect the financial and environmental objectives of the Cerrado Programme (see next section).

At the end of the crop season, BVRio repeats some of the analyses listed above to define whether farmers remain eligible for participation with the RCF Cerrado Programme and whether there were any indication of deforestation or infringement of other eligibility criteria.

With relation to agrochemicals, the agronomist responsible for each farm sends a list of the types of chemicals used (receituários agrônômicos), and a declaration that the products banned by the RCF were not used.

A final crop season monitoring report is prepared for appreciation by the Environmental Committee. The Environmental Committee is not responsible for auditing impacts, but reviewing the information provided.

## 2. Independent monitoring conducted by Earth Daily

In parallel to the monitoring conducted by SIM-BVRio, a separate analysis is conducted by Earth Daily Agro (<https://earthdaily.com>), a data and analytics company providing data services, satellite processing, machine learning and actionable insights to customers to track long-term trends, monitor change, and take guided, strategic actions. From 2024, Earth Daily will offer to RCF the world's first earth observation system designed from the ground-up to produce scientific-quality imagery of the entire earth every day, based on its own constellation of satellites.

At the pre-contract stage, Earth Daily is given a list of CARs of potential participants in the RCF and provide the following analysis:

- Spatial analysis of farms selected to identify deforestation and conversion of native vegetation since 2008 and after 2020;
- satellite images of each individual farm selected;
- location of the farm with relation to vegetation type and biome;
- areas of native vegetation, cleared areas and areas of crop cultivation;
- potential overlaps with indigenous, community or quilombola lands;
- potential overlaps with conservation areas;
- verification of possible infractions of Brazilian legislation (environmental, social, criminal) associated with each farming company and/or individual, based on analysis of governmental databases;
- historic series of crop performance and crop failure, going back at least 5 years;
- a risk assessment of future crop performance.

Throughout the crop season, Earth Daily continuously monitors the development of the crop and provide bi-weekly reports on:

- emergence of planted crops and comparison with historic performance;
- development of the crop and comparison with historic performance;
- any indications of factors affecting crop development and yield, including droughts, pests, diseases, or fire;
- expected harvesting date;
- evolution of harvesting activity;
- real time deforestation and conversion alerts.

The objective of this monitoring activity is to provide early warning of any factor that could potentially affect the financial and environmental objectives of the RCF Cerrado Programme.

At the end of the crop season, Earth Daily provides a report with the following information:

- recent satellite images of each individual farm selected;
- spatial analysis of indications of deforestation or conversion of native vegetation since the previous analyses, when farms joined the RCF Cerrado Programme;
- location of the farm with relation to vegetation type and biome;
- estimates of soy harvested;
- repeated verification of possible infractions of Brazilian legislation (environmental, social, criminal) associated with each farming company and/or individual, based on analysis of governmental databases.

Once the winter crop ("*safrinha*") is planted, the same analysis of crop development, harvesting and deforestation/conversion alerts are repeated.