



# Space Intelligence Mission Report: **Ivory Coast Field Trip**

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# Background

Space Intelligence produced ICE CoT forest/non-forest and deforestation maps for Ivory Coast, for the end of 2020 and 2024. The baseline map establishes forest and non-forest areas (according to the EUDR forest definition) as of 31<sup>st</sup> December 2020. We followed the forest definition as described by EUDR Article 2 (4), namely:

*“forest’ means land spanning more than 0.5 hectares with trees higher than 5 metres and a canopy cover of more than 10%, or trees able to reach those thresholds in situ, excluding land that is predominantly under agricultural or urban land use.”*

Space Intelligence also assessed change between 31<sup>st</sup> December 2020 and 2024, to assess deforestation and the development of new forest. Under EUDR Article 2 (3), deforestation is defined as:

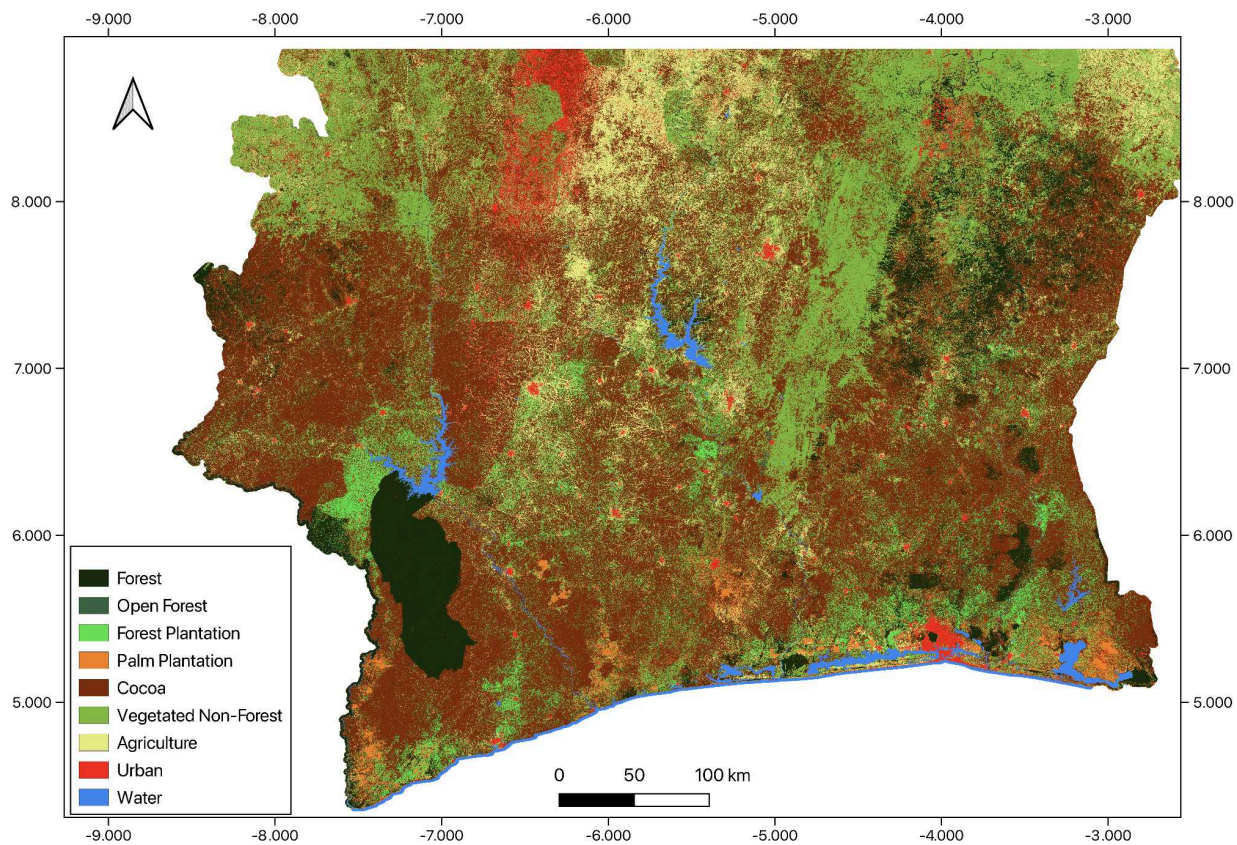
*“ ‘deforestation’ means the conversion of forest to agricultural use, whether human-induced or not”.*

A first draft of the maps was delivered on the 23<sup>rd</sup> July (v1). After receiving some farm polygons from participating cocoa firms, the maps were improved and an updated version (v2) was delivered on the 6<sup>th</sup> August 2024 (see Figures 1 and 2).

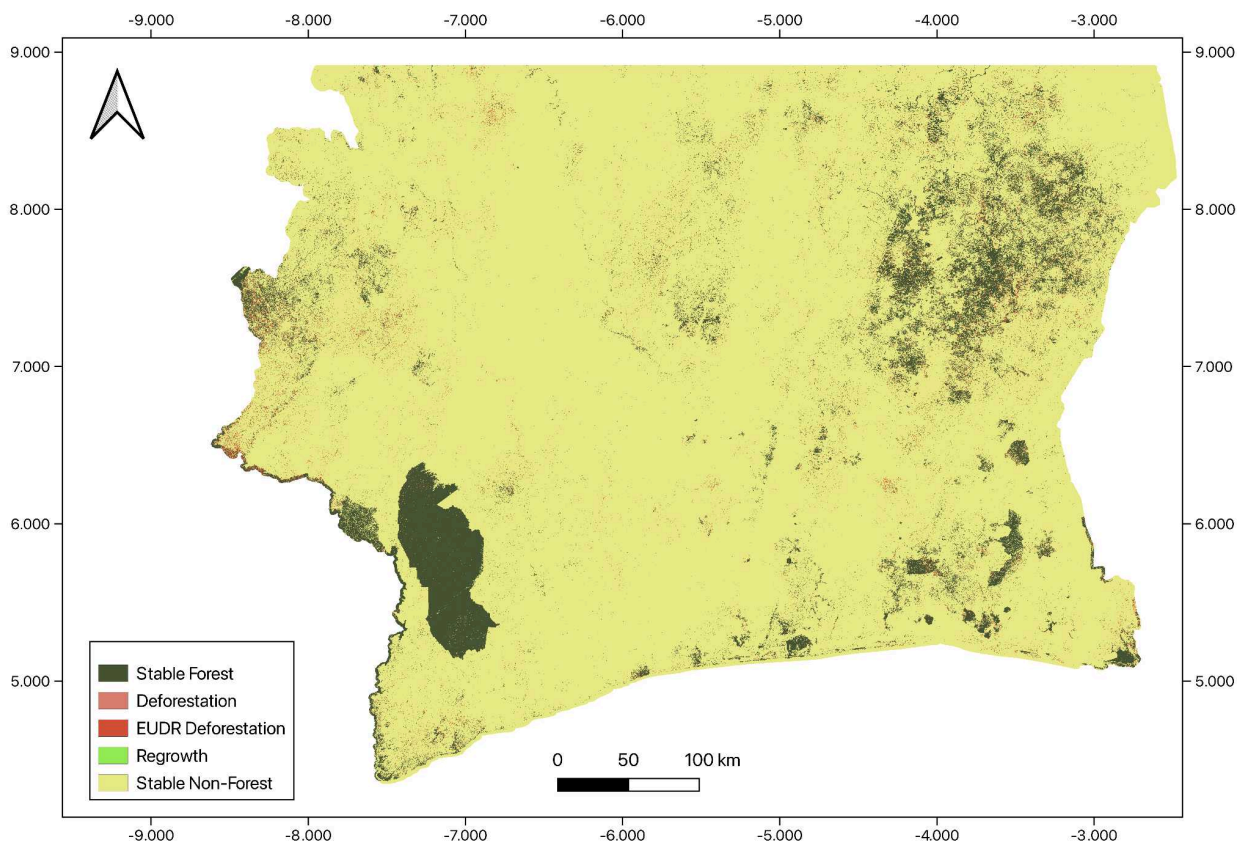
In this document, we summarise the results from the validation field trip to the Ivory Coast, which took place on the 10<sup>th</sup> – 14<sup>th</sup> September 2024. The field campaign helped Space Intelligence validate the final maps.



↑ **Photo 1. (A & B)** Examples of recently felled trees evident from our survey.



↑ **Figure 1.** Landcover map for Ivory Coast for 2024 (v2)



↑ **Figure 2.** Change map for Ivory Coast for 2020-2024 (v2)

# Aim

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The main aim of the field campaign was to visit cocoa farms in Ivory Coast in order to design a validation plan and better understand the EUDR mapping challenges in Ivory Coast and Western Africa.

## Summary of the methodology

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The field trip followed the methods summarised below:

### Selection of farms

We received some first sets of cocoa farms from participating firms. From those, we selected 50 farms where there was uncertainty as to whether or not they should be considered EU compliant (i.e., whether there really were cacao trees planted under the shade trees over the whole farm on 31<sup>st</sup> December 2020 or earlier). We selected a range of 'failed' farms according to our data and the ICE CoT/Meridia test (15 farms in v1 of the maps and 8 farms in v2), with farms from different locations, including farms at the boundary of natural forest, and farms with different levels of canopy cover.

### Field protocol

The validation trip took place during 5 days, with 4 participants from Space Intelligence and from Meridia. Each day a set of around 10 farms was visited. The method followed was:

- Each cooperative was contacted and visited to explain the aim of the field mission. Also, each farmer was informed about the goal of the visit and written permission was obtained.
- The farm visits were performed accompanied by someone from each cooperative.
- In each farm the following information was collected:
  - Plot annotations included taking GPS points, photos, estimating height of cocoa trees and shaded trees, and identifying signs of disturbance.
  - Farmers questionnaires included questions about when the cocoa farm was first established, the farm use (including mix agroforestry), if there has been any disturbance, and the presence of young cocoa trees.

# Summary of the results

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In total, we visited 43 cocoa farms across four different cocoa firms, between 10<sup>th</sup> – 14<sup>th</sup> September 2024. These farms were located in 2 regions, around Divo and Daloa.

## Status of the cocoa plantations

- All the cocoa farms visited were quite small, ranging from 1 to 6 ha.
- All the cocoa farms visited included shaded trees, and almost all included other fruit trees used for the subsistence of the family (including banana, mango and avocado). Some also had planted coffee.
- Many of the farms we visited were quite old, first planted around the 80s or 90s.
- In some old farms, we observed that the trees were mature, unhealthy and producing little to no fruit. In contrast, several farms appeared to be well-managed and were yielding abundant fruit.



- Many of the farmers had planted young cocoa trees throughout the farms, but just to replace some that died due to old age or disease.
- We observed a clear relationship between canopy cover and cocoa tree height. Cocoa trees situated under large shade trees tended to grow much taller.
- Most of the farmers reported that the production during the last cycle has been much lower due to less rainfall and more sun.

← **Photo 2.** Observed fire evidence between forest edge and farm, which damaged many of the crops.

- We only saw a couple of examples of farmers planting new shade trees.
- Most of the farms do pruning and compost, and very few use fertiliser.
- There were significant discrepancies between the farm information we had and the data provided by the cooperatives. Matching plot IDs and other details was often time-consuming, and in some cases, farm boundaries and locations did not align.

### Disturbances in the cocoa plantations

- We noticed tree loss within some farms, but on a very small scale and mainly consisting of shaded trees existing throughout the plantation, and with mature cocoa trees still present in 2024. This means in some farms the canopy cover could have changed from around 50% to <25%, but due to the presence of cocoa in each year this technically should still be classed as stable non-forest.
- We didn't notice any relevant deforestation events to expand the cocoa plantations.
- A number of farmers reported that logging companies had entered their land at night and cut down large shaded trees without permission. Two farms of interest (those flagged for potential tree loss) mentioned that they had been paid to allow removal of a large shade tree by a logging company.
- Two additional farms had a significant number of dead trees, either standing or fallen, with relatively new cacao trees planted. When asked, a farmer explained that his farm was large, and he rotated between planting new cacao trees and harvesting on the east and west sides of the farm.



↑ **Photo 3.** The presence of very large shade trees (Ceiba) which have a wide canopy cover.

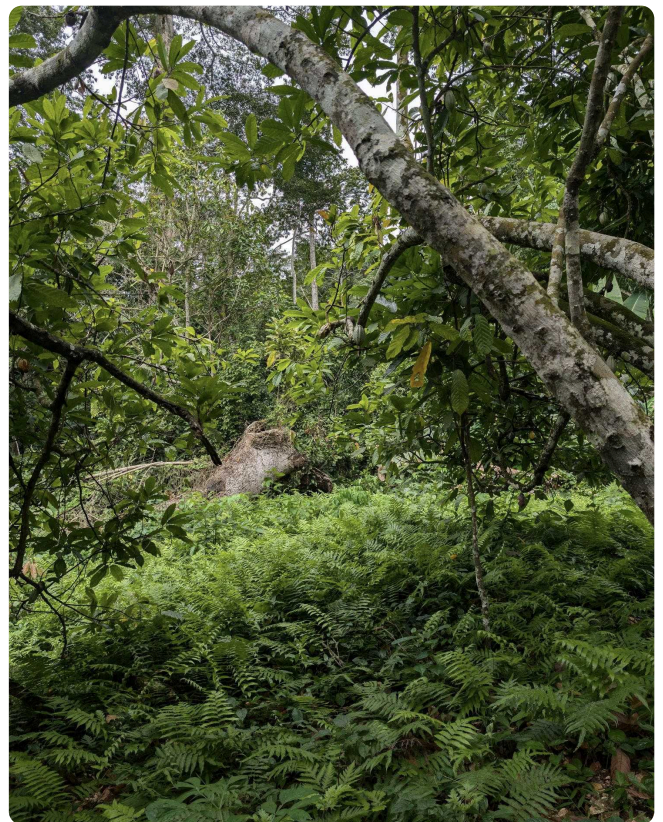


↑ **Photo 4.** Signs of fallen trees and young cacao plants on a farm.

## Conclusions for Space Intelligence Maps

Out of the farms we visited, we failed 10 farms in our v1 version of the maps, and five farms in our v2 maps. Our v2 maps failed less farms than our v1 maps, with only around 0.003% of plots failing in the updated maps. These v2 maps are an improvement over the v1 maps. After visiting the failed farms, we believe that cocoa farms which failed in the v1 maps but passed in the v2 maps should not have been marked as failed in the earlier version, confirming the accuracy of the updated maps. Most of these farms are characterised by the presence of large shade trees.

- Many farmers mentioned that the year had been very dry, leading to lower-than-normal cocoa production. Some also reported that disease had affected their plants, sometimes necessitating tree removal.
- We observed numerous standing trees that had been deliberately killed by ring-barking. This was evident both inside and outside the farms we visited.



↑ **Photo 5.** Presence of many natural forest trees mixed with some cocoa trees and large fruit trees.



↑ **Photo 6.** Some felled trees near the interior of a farm, and mature cacao plants.

Our updated maps also predicted deforestation on some farms, where we observed actual tree loss during our visits. However, despite the reduction in canopy cover between 2020 and 2024, mature cocoa trees were present at each time point. In general, the deforestation detected by our maps was on a small scale, typically only the first or second edge deforestation pixels occurring, so these farms would not fail.

We selected five plots to visit that had failed on v2 of the maps. However, we only managed to visit three plots due to logistical reasons.

We were also unable to visit some of the plots due to mismatching information, and the cooperative taking us to erroneous plots. After visiting some of the farms, it isn't surprising that they failed as there was high canopy cover of very old large trees. Furthermore, the landscape was extremely mixed, and even hard to discern on the ground.

Some interesting GPS points were collected in areas around with apparent logging and new tree crops growing. Upon comparing these areas to the imagery, it looks like some of this might have been old cocoa being chopped down, rather than natural trees.