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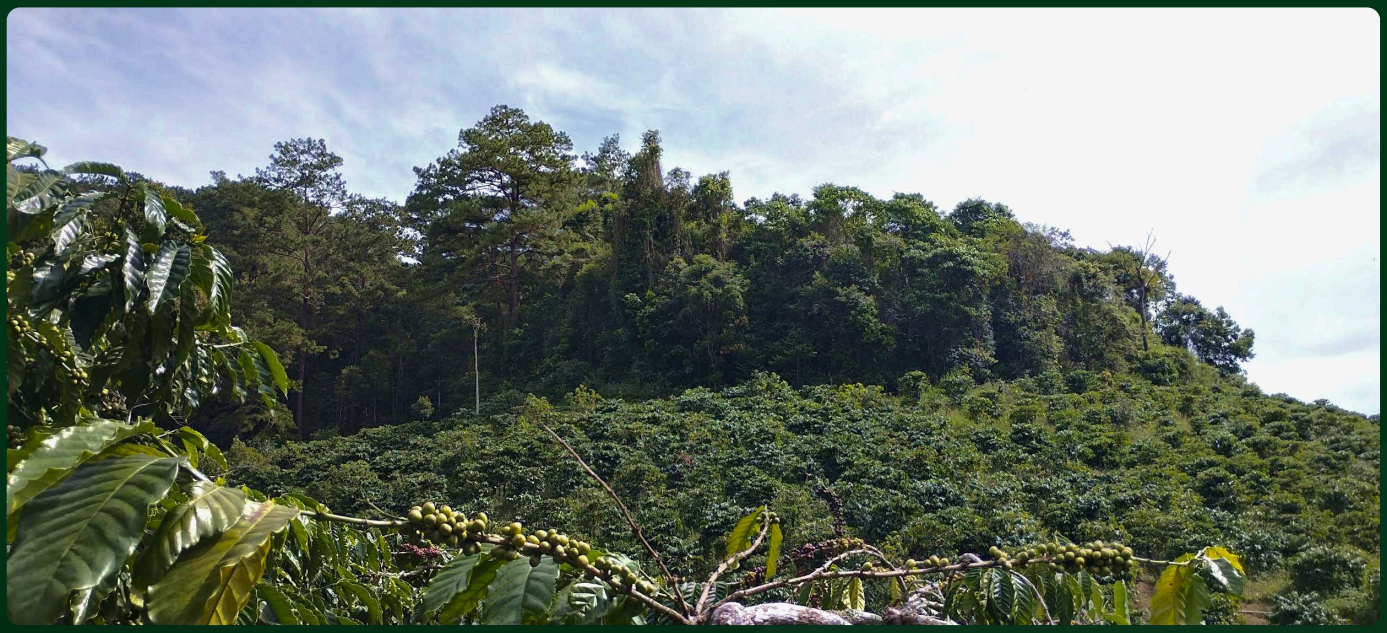

Space Intelligence Mission Report:

Vietnam Field Trip

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Background

Space Intelligence produced ICE CoT forest/non-forest and deforestation maps for Vietnam, for the end of 2020 and 2024. The baseline map establishes forest and non-forest areas (according to the EUDR forest definition) as of 31st 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."*

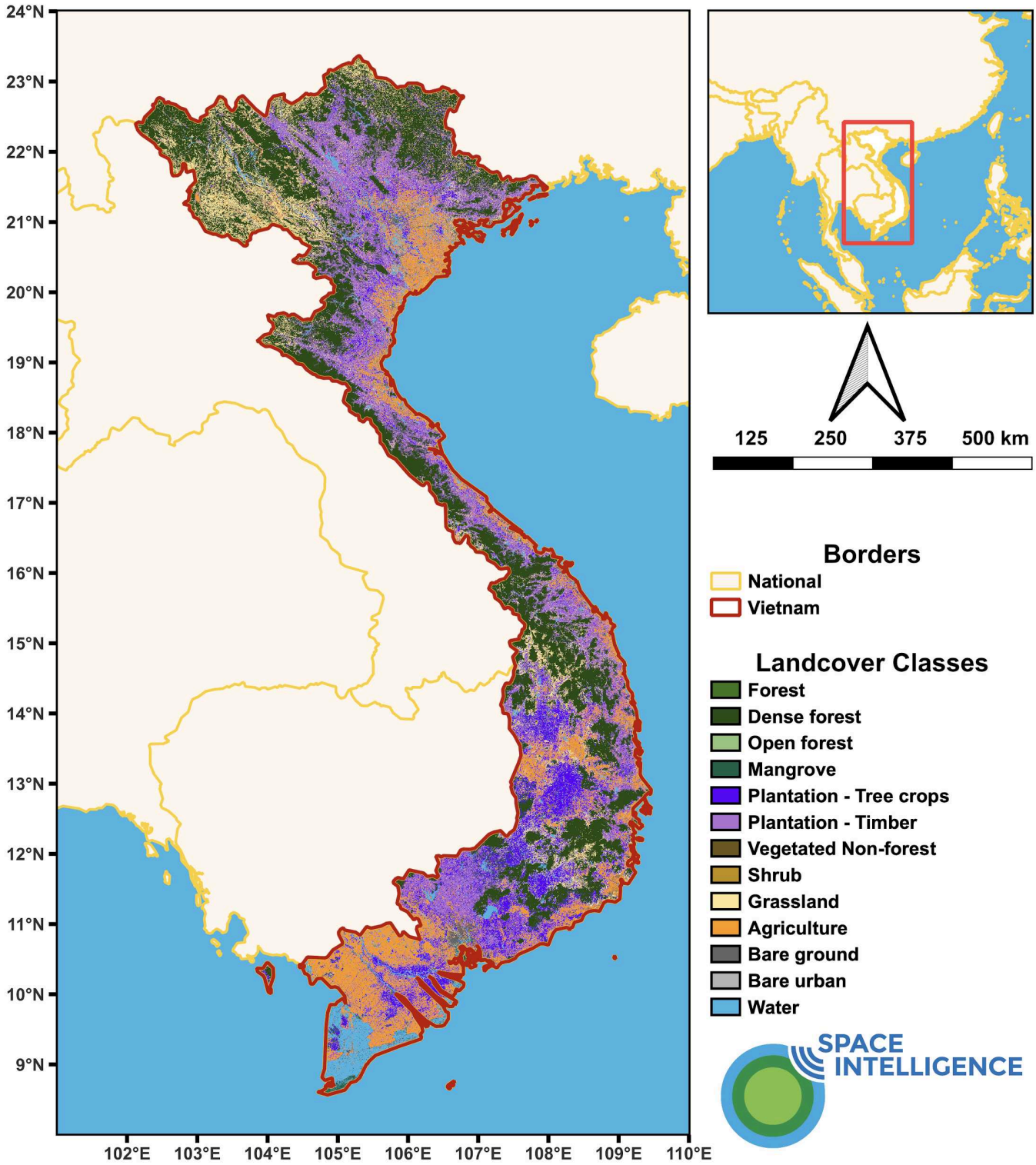
Space Intelligence also assessed change between 31st December 2020 and 2024, to assess deforestation and the development of new forest. Under EUDR Article 2 (3), deforestation is defined as:

> *"'deforestation' means the conversion of forest to agricultural use, whether human-induced or not."*

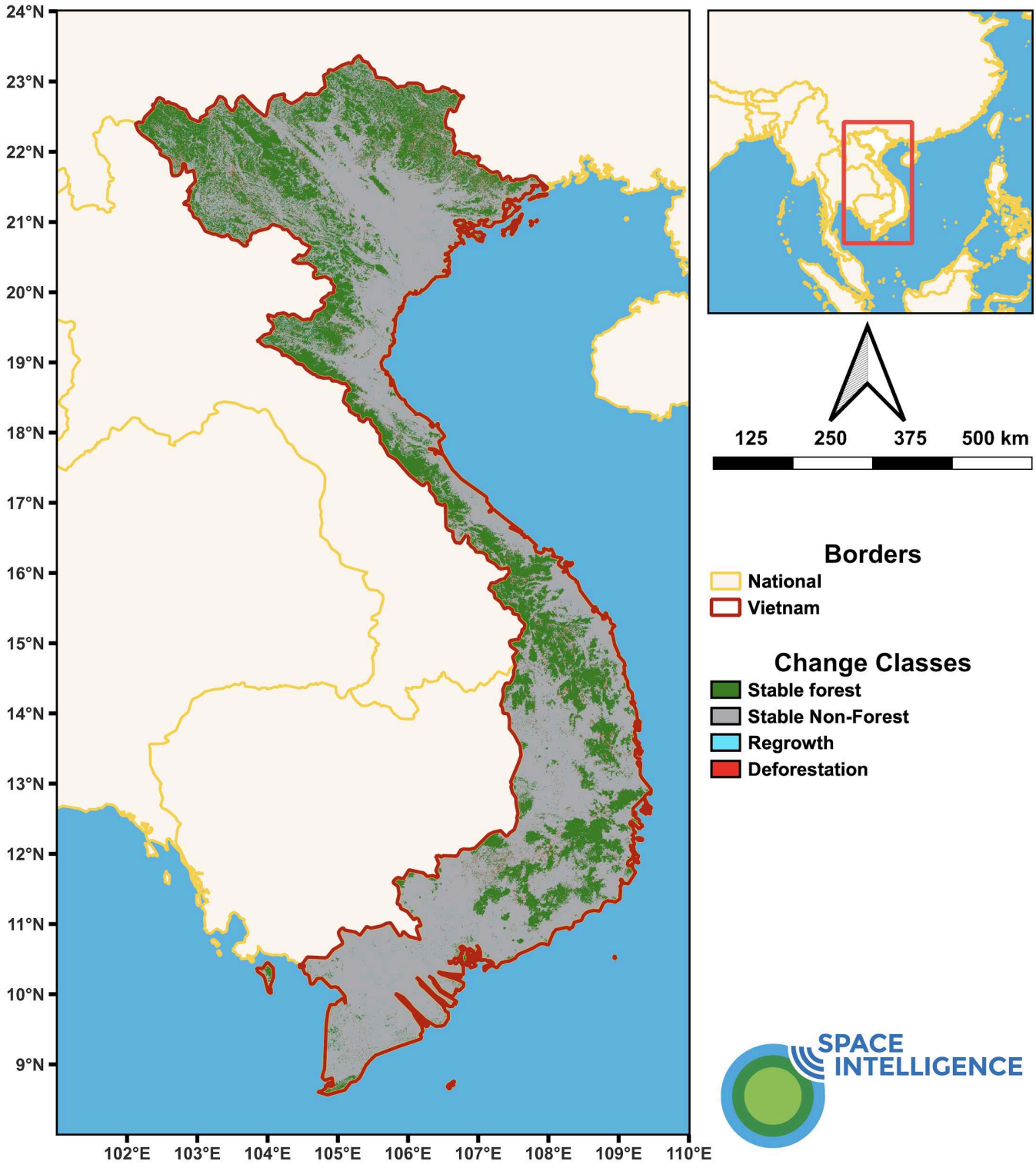
A first draft of the maps was delivered on the 24th of September (v1) - see Figures 1 and 2. After receiving some farm polygons from participating coffee firms, the maps were improved and an updated version (v2) of the maps created.

In this document, we summarise the results from the validation field trip to Vietnam, which took place from the 5th - 10th December 2024. The field campaign helped Space Intelligence validate the final maps.

↑ ***Photo 1. (A & B)*** *Examples of canopy shade trees.*



↑ ***Figure 1.*** *Landcover map for Vietnam for 2024 (v1)*



↑ ***Figure 2.*** *Change map for Vietnam for 2020-2024 (v1)*

Aim

The main aim of the field campaign was to visit coffee farms in Vietnam in order to design a validation plan and better understand the EUDR mapping challenges in different regions of Vietnam.

Summary of the methodology

The field trip followed the methods summarised below:

Selection of farms

We received some first sets of coffee farms from participating firms. From those, we selected a number of farms where there was uncertainty as to whether or not they should be considered EUDR compliant (i.e., whether they really were entirely used for coffee cultivation on 31st December 2020 or earlier). We selected a range of 'failed' farms according to our data and the ICE CoT/Meridia test, including farms at the boundary of true and mapped natural forest, and farms with mapped deforestation between 2020 and 2024.

↗ ***Photo 2.*** *Example of mixed agroforestry in coffee plantations A) Farm in Dak Lak province growing coffee together with corn, cashew, banana and courgettes. B) Fark in Giai Lai province that grows coffee and pepper together*

Field protocol

The validation trip took place during 6 days, with 3 participants from Space Intelligence and a number of local experts and regional contacts who helped to facilitate the survey in different regions/with different producers. Each day around 10 farms were targeted to visit, where practical. The method followed was:

- Where possible, contact was established with farmers prior to visits. For many farms, farmers were not contactable or able to attend owing to the visit being conducted in peak coffee harvest time.

- In such cases, attempts were made to find the farmer in the vicinity of the plots. If this was not possible, as much information was gathered as possible. For example, where the farm was flagged owing to extension of a boundary of mapped natural forest into the farm perimeter, the perimeter was surveyed to establish the correctness of the forest extent relative to the farm boundary.

- The farm visits were performed accompanied by a representative from a coffee producer and, in most cases, additional regional agents for coffee producers.

- In each farm the following information was collected:

    - Plot annotations included taking GPS points, photos, estimating height of coffee, the presence and size of shade trees and any other landscape trees (including other tree crops), and identifying signs of disturbance.

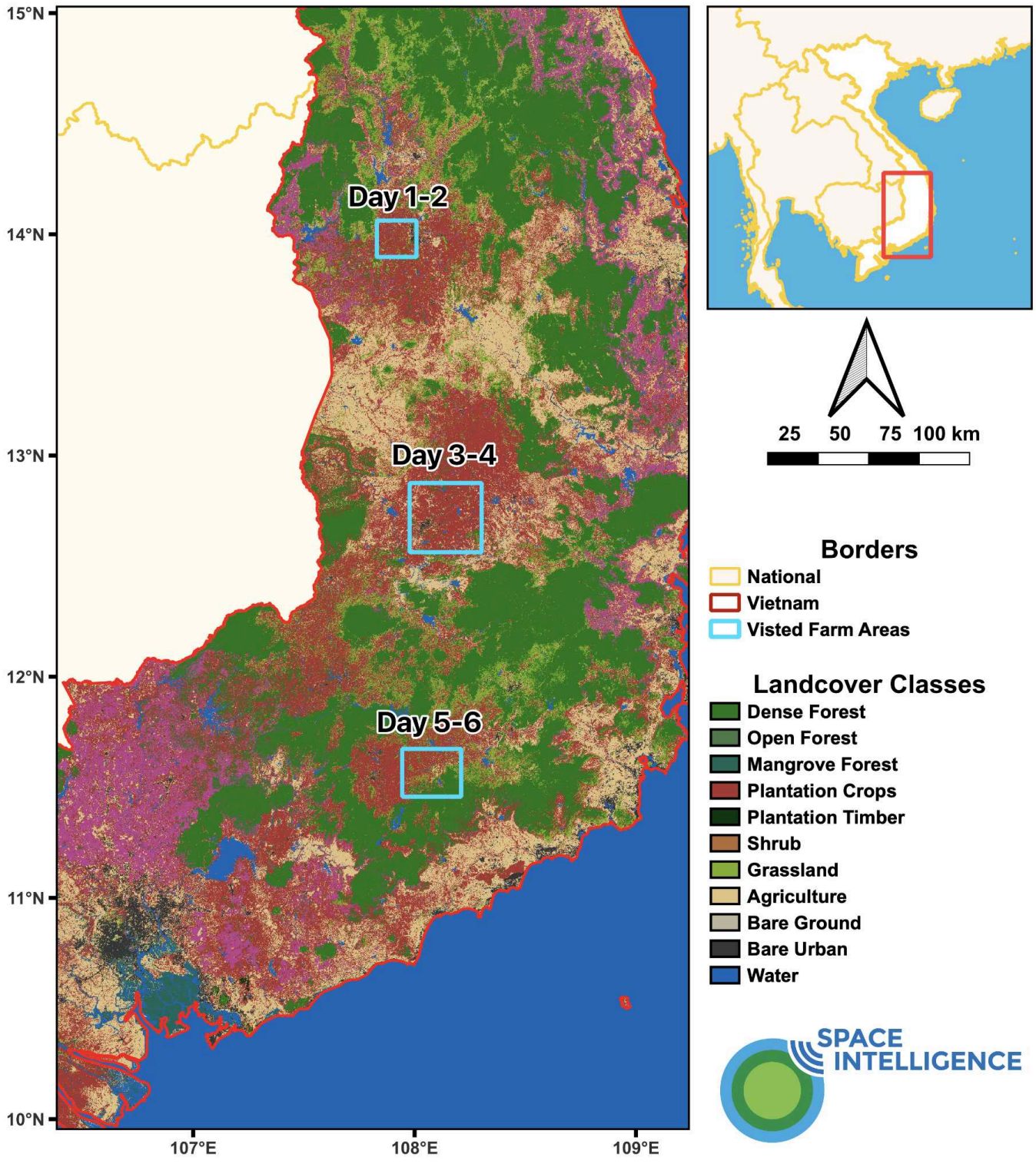
    - Where possible, farmer questionnaires included questions about when the coffee farm was first established, the farm use (including mixed agroforestry), if there has been any disturbance, and the presence of young coffee trees.

↑ ***Photo 3.*** *Example of forest land on coffee plots for the purpose of slope stabilisation.*

↑ ***Photo 4.*** *A) Rejuvenation of coffee by cutting down of old trees and replacement with new trees and B) rejuvenation by grafting new variety onto existing rootstock.*

Summary of the results

In total, we visited 47 coffee farms across five different coffee sellers, between 5th - 10th December 2024 (see Figure 3). These farms were located in three provinces of the southern highlands of Vietnam: Gia Lai, Dak Lak and Lam Dong.



↑ ***Figure 3.*** *Map overview of the 6 days of fieldwork*

Status of the coffee plantations

- All the coffee farms visited were quite small, ranging from 0.3 to 2.2 ha.
- Many of the farms we visited were first planted around the 1990s.
- Planting density was very consistent across farms in all regions (i.e., one coffee tree occupies 9m2).
- There were different approaches to the management of the dimensions of coffee bushes, with a small number of farms allowing significantly taller growth (i.e., the majority of stems 3m or more).
- No clear/consistent signs of any afflictions of coffee bushes (coffee rust etc).
- Many farms visited (particularly in Lam Dong) occurred on steep slopes (>20 degrees), and had a pronounced terrace structure.

↑ ***Photo 5.*** *Different seasonal stages of coffee. A) Flower. B) unripe beans. C) Beans ready to harvest*

↑ ***Photo 6.*** *Wind farms in the coffee plantation areas*

- Many of the coffee farms visited had other tree crops/fruit trees (including cashews, banana and avocado).

- A limited number of plots included true canopy shade trees (>30cm diameter and +15m height Acacia spp.). Notable examples of this were in Dak Lak and Dakman farms.

- Planting of small timber trees (most commonly Litsea spp.) was relatively common, particularly in Gia Lai. These were subject to harvest, but predominantly farmers indicated that these were planted to provide wind protection.

- One farm had an area of what would be classified as stable forest within the extent of the farm area. The purpose of maintaining these was to enforce slope stability on steep lands. There was no sign of removal of trees between 2020 and 2024.

- Replenishment of coffee tree stock was observed in many plots and grafting of the "new variety" (a subspecies of Caffea robusta introduced to Vietnam ~20 years ago) onto existing rootstock common. More rarely expanses of coffee trees were removed and replanted with juveniles. In the case of the latter, the vast majority of the examples observed seemed to be recent (<2 years old).

Disturbances in the coffee plantations

- We observed cutting of small trees (<20 cm) at the edge of farm polygons for the purpose of reducing shade for either drying beds or to favor coffee trees.

- In the case where forest land was observed on-farm, there were no signs of cutting of trees between 2020 and 2024. There were signs of older (comfortably before 2020) cutting of trees. However, as this forest was preserved for the purposes of slope stabilisation, it seems that the intention is preservation rather than expansion of coffee areas.

- We didn't notice any relevant deforestation events undertaken to expand the coffee plantations.

- We observed harvesting of planted shelter Litsea spp. in several plots, all around 15cm diameter. This is for the purpose of timber and is part of the planned cycle of use in these trees. Resprouting rate suggests that these stems are replaced in <10 years, as confirmed by farmers in Gia Lai.

↑ ***Photo 7.*** *Coffee beans being dried after harvest*

Conclusion for Space Intelligence Maps

The majority of the farms visited in this exercise were EUDR compliant, with errors in maps (and in some cases farm data) responsible for the observed failures. There were some common themes which lead to erroneous failing of the farms in the ICECoT platform when testing against the Space Intelligence v1 maps of Vietnam.

Whilst true shade trees were rare in these plots (Caffea robusta being more tolerant of open growing conditions and being the main cultivar of all plots visited), mixed agroforestry use was relatively common. Cashew for example was observed in many plots and in some cases mature trees of more than 10 m were located within plot boundaries. In several plots, this contributed to false mapping of forest in patches or contiguous areas of the coffee cultivation area. In the rarer cases of true shaded coffee, the maps also mapped forest areas in some of the shaded areas, despite the confirmed presence of mature (>20 year old) coffee underneath the canopy.

In a small number of cases, the polygons delimiting the farm were not accurate, leading to overlap (or at least exacerbated overlap) with mapped forest area in the v1 maps. In actuality, these farms were clearly mature (>20 years old) coffee plantations with no signs of removal of trees and therefore should have been EUDR compliant.

We further found that in some cases in Lam Dong, the v1 maps predict natural forest where the actual land cover is pine plantation.

Finally, there was one clear case of true forest existing on farm lands with no cultivation underneath. This forest area served the purpose of land stabilisation in extremely steep areas. The maps therefore accurately represented the landcover and for that reason this farm should technically fail the test based on the current test specifications.

Overall our findings indicate that the vast majority of farms visited were EUDR compliant and failures resulted from issues with the v1 maps, or in a small number of cases, a combination of issues with v1 maps and the submitted farm data.