LAND USE CHANGE FOR OIL PALM

Although land use change could refer to any change in land use classes, it generally describes the **conversion** of -

Forest or **peatlands** → Agricultural land like **oil palm**

Source: Modified from FAO, FRA 2000 on Definitions of Forest and Forest Change (2000)

The United Nations' Food and Agriculture Organization (FAO) defines **deforestation** as **permanent destruction of forests** in order to make the land available for **other uses**, so monitoring land use change is important for companies with **zero deforestation commitments**.

In the past, finding a reliable proof **IF** and **WHEN** land use change took place is rather difficult. There is no clear evidence on-site that gives hints if a field was converted 10 years or 10 months ago except for local witnesses or occasionally, official documents and maps.

Today, technology development has made it possible to have a good eye witness on-site almost everywhere, almost every time through the use of Satellite Imagery.

With the use of satellite imagery, we can actually see what happened and when it happened. This can be done via visual interpretation or by satellite imagery data analysis using remote sensing software packages.

A widely available desktop based tool that can be used to monitor land use change is Google Earth.

Released by Google in 2005 that allows users to freely view medium, high and very high spatial resolution satellite imagery. The best imagery available for each site is automatically loaded in Google Earth's **user-friendly software** that allows users to zoom into any place on Earth while the software seamlessly manages large volumes of geospatial data.

It can also be used to visually interpret satellite imagery over a given area on multiple dates which is a form of land use change monitoring.

The images below taken from Google Earth show satellite images from 2 separate years that show land use change within the effective supply base of a palm oil mill, (50km radius) shown in **red**, which is also referred to as its **'catchment area'**. The darker green areas in the earlier image (from year **2000**) shows that the area within the supply base is mostly forest with some road networks, agricultural areas and clearings in brown and light green. In the image on the right (from year **2016**), we can see a lot more areas in brown and light green, which indicate that a lot more forest conversion to other land uses (deforestation), particularly agricultural land like oil palm has taken place.
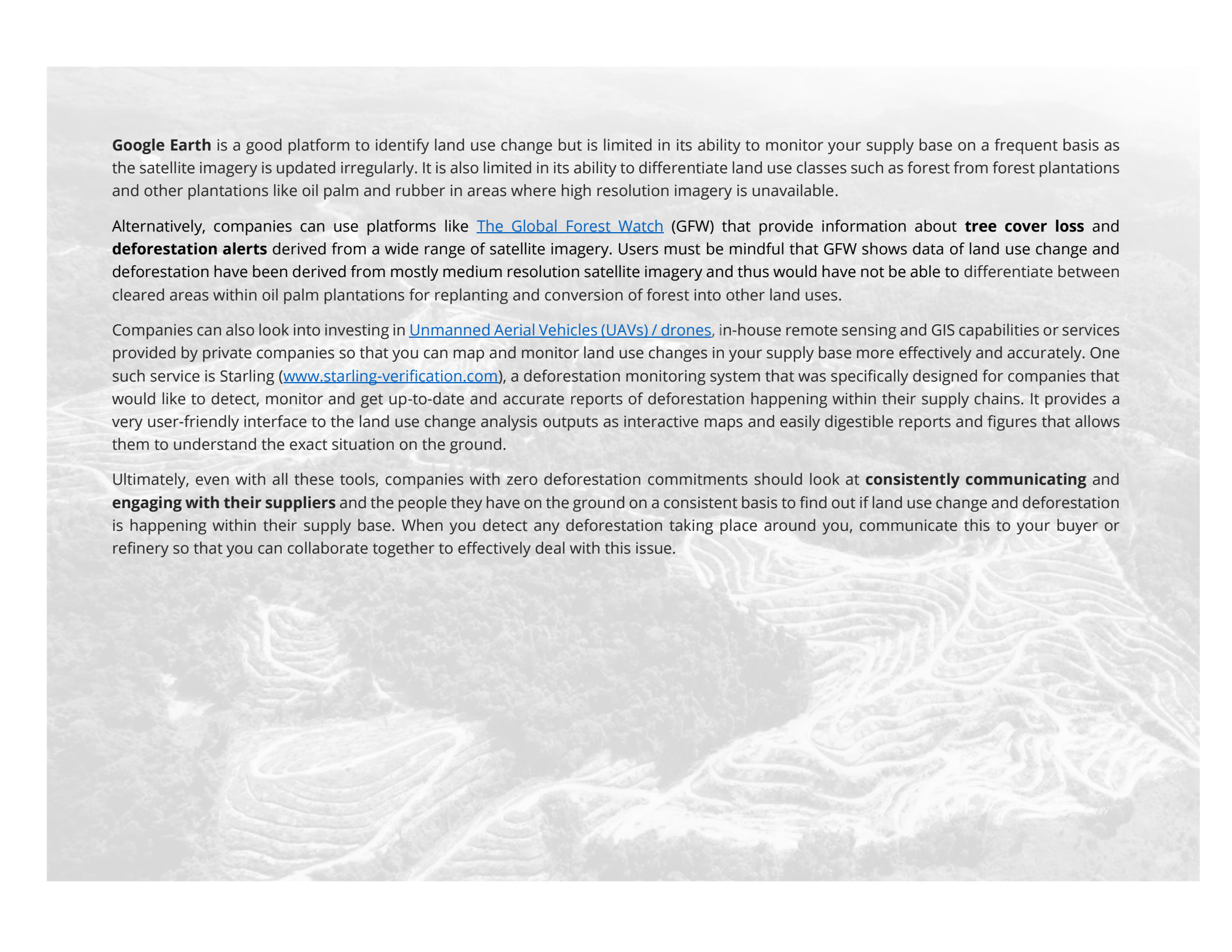

Google Earth Satellite Image - Year **2000**

Palm oil mill effective supply base

Palm oil mill   50km

Google Earth Satellite Image - Year **2016**

Palm oil mill effective supply base

Palm oil mill   50km
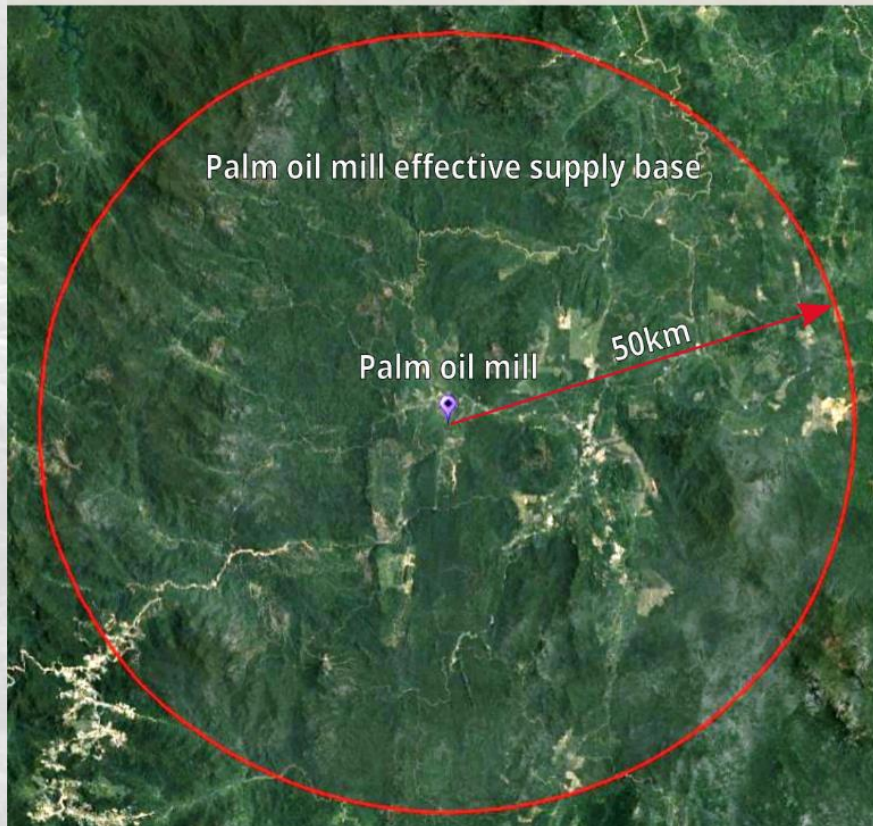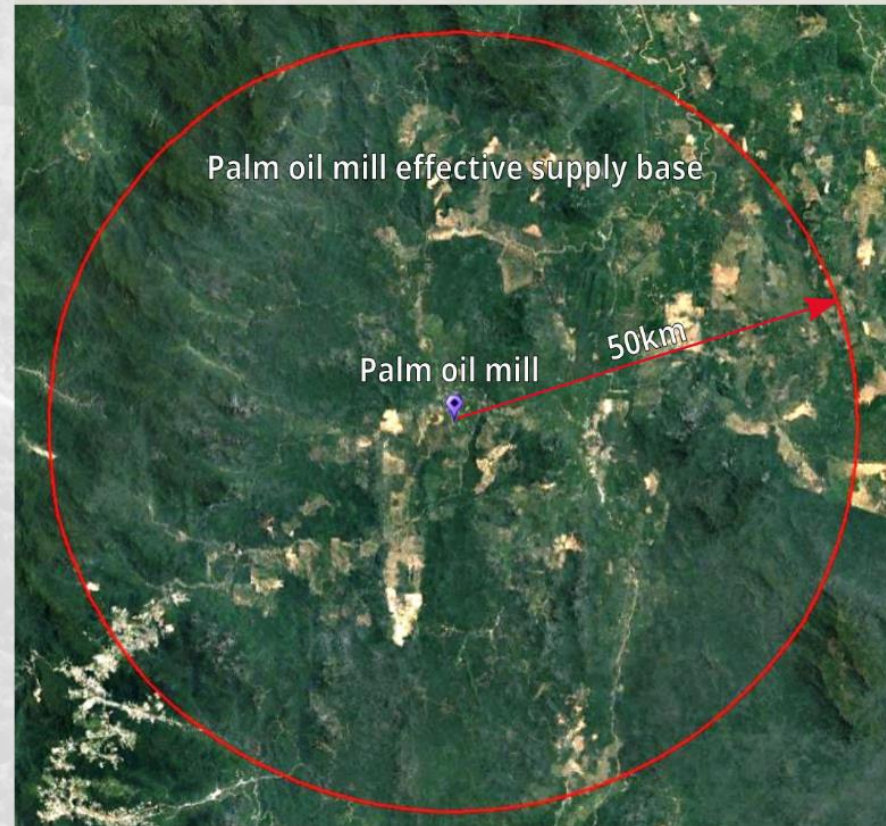
By visually inspecting the areas within the oil palm mill catchment area over multiple dates, you can monitor the changes of land use and determine if deforestation is happening within your supply base.

Google Earth is a good platform to identify land use change but is limited in its ability to monitor your supply base on a frequent basis as the satellite imagery is updated irregularly. It is also limited in its ability to differentiate land use classes such as forest from forest plantations and other plantations like oil palm and rubber in areas where high resolution imagery is unavailable.

Alternatively, companies can use platforms like The Global Forest Watch (GFW) that provide information about **tree cover loss** and **deforestation alerts** derived from a wide range of satellite imagery. Users must be mindful that GFW shows data of land use change and deforestation have been derived from mostly medium resolution satellite imagery and thus would have not be able to differentiate between cleared areas within oil palm plantations for replanting and conversion of forest into other land uses.

Companies can also look into investing in Unmanned Aerial Vehicles (UAVs) / drones, in-house remote sensing and GIS capabilities or services provided by private companies so that you can map and monitor land use changes in your supply base more effectively and accurately. One such service is Starling (www.starling-verification.com), a deforestation monitoring system that was specifically designed for companies that would like to detect, monitor and get up-to-date and accurate reports of deforestation happening within their supply chains. It provides a very user-friendly interface to the land use change analysis outputs as interactive maps and easily digestible reports and figures that allows them to understand the exact situation on the ground.

Ultimately, even with all these tools, companies with zero deforestation commitments should look at **consistently communicating** and **engaging with their suppliers** and the people they have on the ground on a consistent basis to find out if land use change and deforestation is happening within their supply base. When you detect any deforestation taking place around you, communicate this to your buyer or refinery so that you can collaborate together to effectively deal with this issue.