Orbital Insight

CASE STUDY

Unilever's approach to tackling deforestation using geolocation data

The consumer goods giant worked with tech company Orbital Insight to provide transparency of its commodity supply chains from farm to mill and link this with deforestation data.

Challenge

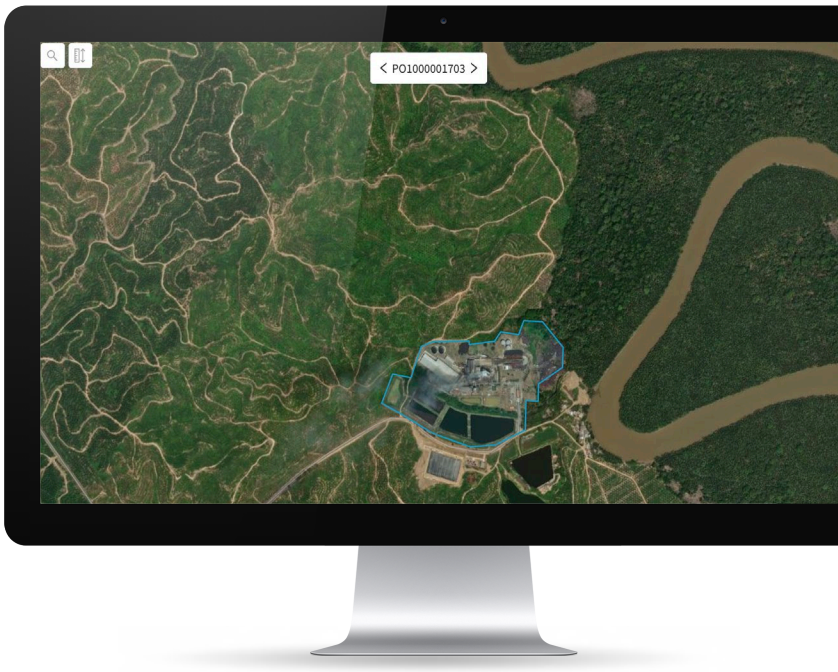
Between 2015 and 2020, the world lost an estimated 10m hectares of forest per year, largely as a result of land being converted for agricultural use. This destruction is a major threat to the environment, both as a contributor to climate change and because of the consequent destruction of diverse habitats for plants and animals.

Tackling this is an important focus for Unilever, the global consumer goods manufacturer, which places sustainability at the heart of its strategy. Unilever has committed to ensure that by 2023 all of the forest-related commodities in its supply chain – including palm oil, soy, cocoa, tea, and paper and board – are deforestation free.

This is a challenge given the many layers that are present in the commodities supply chain. Gaining visibility of the "first mile" between individual smallholder farms and the mills that process the raw materials is a particular challenge, as they are often sourced from a substantial number of different plantations or farms and mixed together before they even reach a mill for processing.

The use of satellite imaging to identify land usage changes that indicate deforestation was already an established practice by Unilever, but this information had its limitations without the ability to connect it directly with the plantations or farms that source their raw materials in a given area.

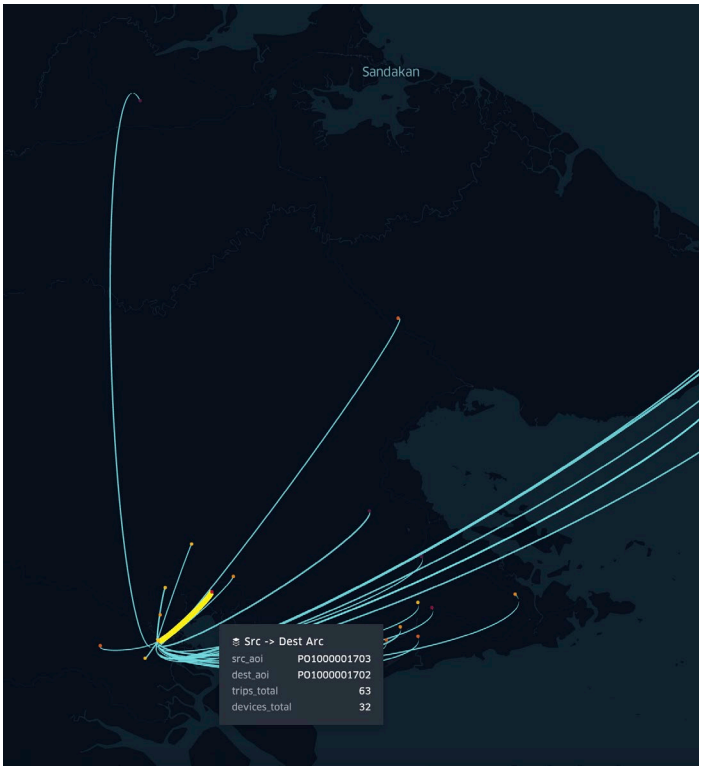
The current approach taken by most companies sourcing these kinds of commodities is generally to draw a 50m radius around a mill and assume that farms or plantations in those areas are equally likely to be supplying the mill, using that information to identify deforestation risks. While this has been generally accepted as a useful approach, Unilever desired more precise insights to gain better visibility and accelerate taking action on the ground – both to act on deforestation but more importantly to prevent it



To gain greater insight of these links between farmers and processors, Unilever's sustainable sourcing team, part of the procurement function, partnered with Orbital Insight, a US technology company, to build a system that combines satellite imagery with GPS geolocation data, allowing it to visualize approximately the potential areas where its raw materials have a likelihood to be coming from and take action to ensure they are sustainable. The system becomes precise when the actors in the supply chain all opt into its use.

Approach

How the tool works



Data sources

The tool developed with Orbital Insights draws on geolocation data that is collected from mobile phones and other devices as they move between locations within the supply chain. The rapid rollout of cellular data networks and smartphone penetration in key countries in Unilever's supply chain, such as Brazil and Indonesia, has led to an explosion in opportunities to leverage big data analysis, with hundreds of millions of active users in these areas.
For data privacy reasons, it is essential that the tool preserves the anonymity of these users, collecting the data in aggregate to look at patterns of movement between areas, rather than individual journeys.

Data input

The system relies on applications and on so-called "geofences" drawn around so-called Areas of Interest (AOIs), such as palm oil mills or soy silos. These digital boundaries allow Orbital to detect when a device has entered a particular AOI. The system can then analyze the cellular data to determine where the devices came from before entering the facility and where they went after.

The data compiled through this process is analyzed using two distinct sets of algorithms, one focusing on the relationship between AOIs and farms, and the other looking at downstream linkages between AOIs, refineries and ports.

Analyzing the relationship between AOIs and farms

The first set of algorithms work by generating heatmaps, displaying patterns of movement between farms and AOIs as hotspots on a map. The data can also be used to calculate the typical geographical spread of an AOI's supply chain, allowing Unilever to infer where other mills are likely to be sourcing from based on device traffic, infrastructure and geographical factors.

Downstream data algorithms

As Unilever is typically the 4th, 5th, 6th or even 7th link in the supply chain, it also needs to gain visibility of the links between farmers and early-stage processors in order to determine the links between these and its own suppliers. To that end, the second set of algorithms are used to gain an insight into the movement of materials between different AOIs, such a mills and refineries, and other points downstream in the supply chain, such as ports and refineries.

This allows Unilever to create a visualization of the whole network of the supply chain in a particular area, including frequency and strength of the linkage between different nodes within the supply chain, based on frequency of travel.

Turning the data into actionable insights

With the ability to visualize its entire supply chain of a particular commodity in a geographic region and link this with deforestation data, Unilever will be able to take action to ensure its supply chain is not contributing to this problem.
The results of the geolocation data are used where possible and as supplementary information to include in Unilever's risk assessments.
At the same time, Unilever works in parallel with partners on the ground to help increase profitability and income for farmers, professionalizing their operations and encouraging them to obtain certification from the Roundtable on Sustainable Palm Oil.

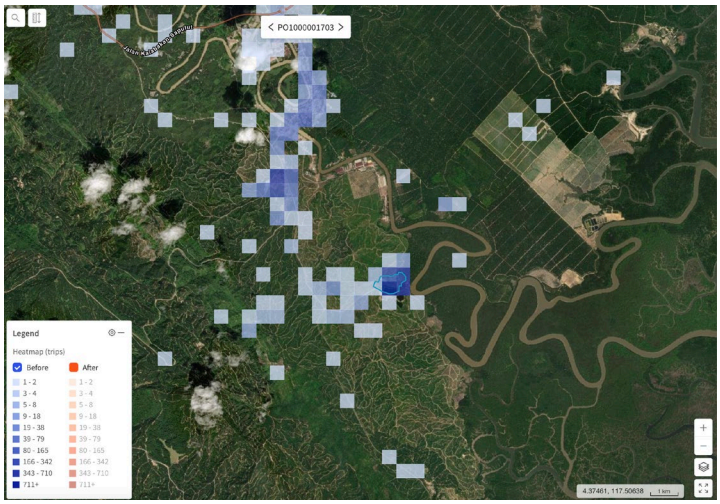
Outcome

Results

By taking advantage of advances in cellular data capture and analysis, Unilever and Orbital have been able to generate cutting edge-levels of visibility over their commodity supply chain flows.

While the project is still in the relatively early stages of being rolled out, it has already been trialed in Unilever's supply chain of palm oil mills in Indonesia and soy in Brazil and the company is now looking at how to scale it globally and across a wider range of commodities. It is also hopeful of driving change in the wider industry by leading the way for other buyers of palm oil to improve their traceability.

Dave Ingram, Unilever's chief procurement officer, describes the technology as a "step change" in the company's efforts to tackle deforestation by generating visibility of its supply chain at scale.



"This better monitoring helps all of us to understand what's happening within our supply chains so we can get the heart of any issues and manage them quickly. By partnering with others and using leading technology to carefully monitor our forests, we can all get closer to achieving our collective goal of ending deforestation."

Next steps

Having successfully launched the pilots in Malaysia and Indonesia, Unilever is currently focused on developing the application of the solution in those markets, pushing to gain more granular data through methods such as encouraging opted-in geolocation traceability among suppliers that will allow it to gain more granular visibility of its supply chain.

About Orbital Insight

Orbital Insight is a leader in the geospatial analytics and location intelligence and helps organizations understand what's happening on and to the Earth. Customers including Shell, Deutsche Bank, RBC Capital Markets, The World Bank, and the U.S. Department of Defense use Orbital Insight's self-service analytics platform to make smarter business decisions, build sustainable supply chains, and improve national security.

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