

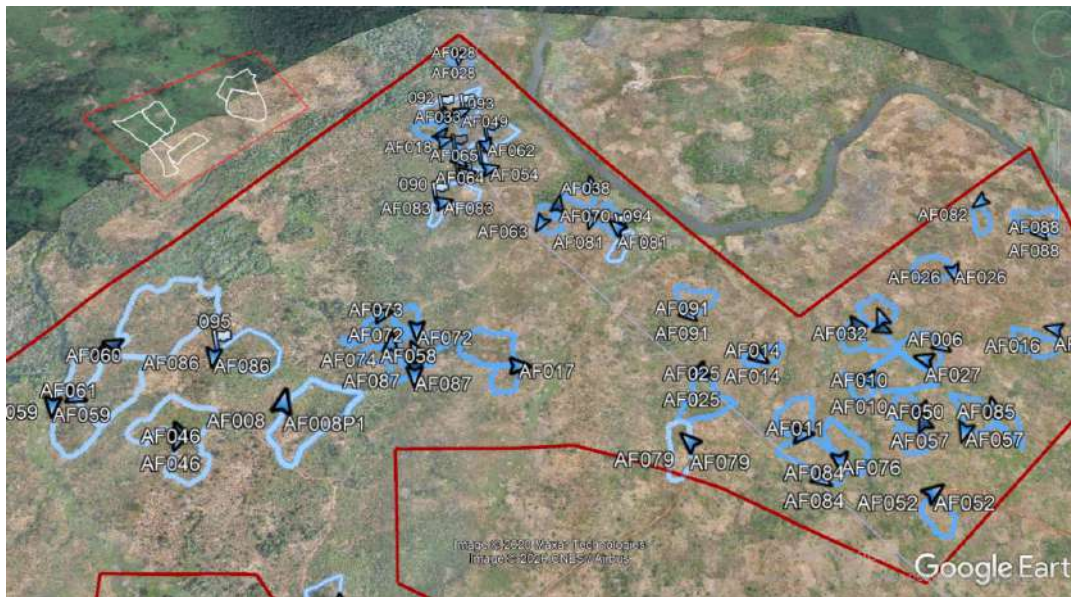
Drone technology for traceability and certification of cocoa cooperatives in Côte d'Ivoire



Flight Preparation



Field Work with COOP-CA COOPRAD



KML screenshots

OVERVIEW	
Flying Labs	Côte d'Ivoire Flying Labs
Geographic area	Biankouma, Western Region of Côte d'Ivoire
Date	February 2020
Sector program	DevRobotics

SCOPE	
Stakeholders (clients)	<p>KINEDEN 1291 farmers of COOP-CA COOPRAD cocoa cooperative Cocoa growing communities</p>
Challenge	<p>The farmers of cocoa cooperative COOP-CA COOPRAD and their exporter (KINEDEN) face challenges related to a lack of traceability. Neither party knows the precise contours and area of the producers' plots, and they therefore continue to rely on existing data which is unreliable. Further, in order for cocoa farmers to become certified and reap the financial benefits of selling certified cocoa, farmers must demonstrate that they abide by a number of standards; this includes GPS tracing of plots and georeferenced aerial maps. This technology is not readily available to these actors.</p>
Scope	<p>The objective of this project was to support the COOP-CA COOPRAD cocoa farmers and their exporter by completing a GPS delineation of each producer's plot in order to rectify errors in the existing producer information database, and thereby improve traceability. The initiative also aimed to complete the aerial mapping by drone of a total of 4000 Ha of producer plots and provide geo-referenced maps to assist farmers in becoming certified.</p>
Outcome	<p>The initiative was composed of 4 phases: (1) Make cooperative management and the 1291 farmer members aware of GPS plot tracing, (2) Data collection part 1: GPS plot delineation to audit and correct database, (3) Debrief with cooperative management and make management and farmer members aware of aerial mapping by drone for certification, (4) Data collection part 2: complete drone mapping of 4000 cocoa hectares.</p> <p>After both data collection phases and debriefing with KINEDEN and the COOP-CA COOPRAD cooperative, KINEDEN was provided with an updated database composed of detailed farmer data including the rectified delineation of each producer's plot. Cooperatives were provided with georeferenced maps complete with all the details needed to submit to certifying bodies.</p> <p>The main challenges of the mission were related to topography and weather in the region where the activity took place. The Western region of Côte d'Ivoire is heavily forested and quite mountainous. As such, identifying appropriate locations to land the Ebee drone and to take off proved challenging. The weather also presented challenges as there was full sunshine for numerous</p>

	hours of each working day (between 11am and 3pm) during which the drone could not be flown due to the extreme heat. This greatly reduced each working day's potential flying hours. In order to mitigate challenges related to the terrain, the team visited the site in advance of the mission to scope out appropriate landing and taking off zones. To address the limitation in working hours, the team began working earlier and ended later each day in order to compensate for the lost hours in the middle of the afternoon.
Next steps	Côte d'Ivoire Flying Labs will now work with 7 additional KINEDEN cocoa cooperatives. The aim will be to complete GPS tracing of another 6,235 producers' plots in order to rectify KINEDEN's entire database and improve traceability, and to prepare georeferenced maps of each producer plot to facilitate the certification process and contribute to improving farmers' revenues.

DATA ACQUISITION	
Size of area	2800 ha (28 km ²)
Drone	eBee Classic
Sensor(s)	SODA
Flight plan software	eMotion
Flight height	260 meters above ground
GSD (Accuracy)	10.93 cm
Number of images acquired	1727
Number of flights	15
Time invested in data acquisition	8 hours
Georeferencing	Onboard GPS

DATA PROCESSING & ANALYSIS	
Processing software	Pix4Dmapper
Processing time	9h
Data products	Orthomosaic, KML files
Analysis tools	QGIS, ArcGIS
Analysis outputs	ArcGIS Online Maps
Final outputs shared with stakeholders	Excel files (social information, size of the land and KML link), KML files
Data sharing	Cloud storage (ArcGIS Online) and email