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## Unmanned Aircraft Systems (UAS) Training

Report on the UAS Training in Colombia:  
Let's COORDINATE, Let's FLY and Let's MAP



November 2018



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# Introduction

At the end of November 2018, World Food Programme (WFP), as lead of the Emergency Telecommunications Cluster (ETC), conducted the Unmanned Aircraft Systems (UAS) Training in Bogota, Colombia. It consisted of three modules: Let's COORDINATE on strengthening cooperation between national and international stakeholders, Let's FLY—a practical flight exercise and Let's MAP on processing data. This training built on the original coordination workshop conducted by WFP with support from the Government of Belgium in December 2017.

The National Disaster Management Office of Colombia (UNGRD) and WFP co-organized this learning experience, with funding from the Government of Belgium and support from the Professional Drone Association (APD).

58 participants from 19 organizations attended the three-module training—many coming with their own experiences, lessons-learned and best practices that were shared in course of two weeks. This training engaged the organizations which were involved in the original coordination workshop, but was also extended to further participants. The main aim of the UAS training was to bring together national actors and encourage coordination through opening up a dialogue as well as to equip the participants with practical skills of operating multi-rotor drones in humanitarian context as well as processing the obtained imagery.

**This training was organized and supported by:**





# Training Overview

Between 18 and 30 November, WFP, supported by the Government of Belgium and UNGRD, conducted the full UAS Training in Bogota, Colombia. WFP delivered three modules Let's COORDINATE, Let's FLY and Let's MAP. The training brought together national entities, intergovernmental organizations and humanitarian agencies.



**19 ORGANISATIONS**

**58 PARTICIPANTS**

**31% WOMEN VS. 69% MEN**

## Participating organizations:

- APD;
- Civil Aeronautics (Aerocivil);
- District Institute for Risk Management and Climate Change (IDIGER);
- Fire Departments of Bogota;
- Food and Agriculture Organization (FAO);
- Government of Colombia;
- Geographic Institute Agustín Codazzi (IGAC);
- Humboldt Institute;
- National Airforce;
- National Army of Colombia;
- National Civil Defense;
- National Navy of Colombia;
- National Parks of Colombia;
- National Police;
- Office of the High Commissioner for Human Rights (OHCHR);
- Red Cross Colombia;
- UN Verification Mission in Colombia;
- UNGRD;
- WFP.

## The training consisted of three modules:

**LET'S COORDINATE**



**LET'S FLY**



**LET'S MAP**



During two weeks, the participants got over 20 flight hours using multi-rotor systems. They also received training on mapping (for creation of 2D maps and 3D models), as well as participated in a detail discussion on national and international regulations. The training was complemented by a demonstration of fixed-wing UAS.

## Let's COORDINATE

The facilitators delivered theoretical sessions on:

- Airspace regulations;
- Best practices of UAS coordination;
- Lessons-learnt;
- Safety procedures; as well as
- Data privacy and protection.

## Let's FLY



**20 FLIGHT HOURS**

Technology used for practical sessions:



**SPARK**

**MAVIC PRO**

## Let's MAP

Participants learnt to process drone images into 2D maps and 3D models for assessments, using the following software:

- Pix4Dmapper; and
- Agisoft PhotoScan.



*“This training was truly eye-opening for us: we’ve been using drones for our operations over the last three years, but we have never analyzed the collected data at this level. We use drones for monitoring risk areas and for aerial surveillance, and we did not know that so much could be done with these types of software. I am sure from now on our drone operation will be much more effective, especially in emergency response.”*

**Yesenia Barragan, National Police Officer**

**Survey results (Let’s COORDINATE):**

- More than 90% of the participants were satisfied with the Let’s COORDIANTE module, incl. content and the delivery methods.
- Among the biggest personal learning, participants named insights into: regulations, coordination mechanisms, emergency response, as well as technical features of drones.
- From organizational perspective, the biggest learnings were: mapping, coordination, partnering with other agencies, use of drones in emergency response, as well as potential applications for agriculture.
- The participants suggested the following improvements: provide simultaneous interpretation; shorten the commute (venues closer to each other); share presentations beforehand for background information.

**Survey results (Let’s FLY and Let’s MAP):**

- 94% of the participants were satisfied with the two practical modules, positively assessing the content and the delivery methods.
- The respondents particularly praised: the expertise and knowledge sharing by all instructors; the session on data verification and map creation; and practical sessions with different types of UAS.
- The main personal gains were: flight planning; operating of drones; as well as mapping for development and humanitarian projects.
- The main gains from organizational perspective were: use of drones for emergency response; coordination of drones in conflict areas; as well as application of processing tools for disaster risk management.
- Suggestions for improvement included: logistical arrangements.

*“Bomberos de Bogota started from scratch. We didn’t know much about drones, but thanks to WFP, we realized that our capacity building should not only focus on this one technology, but look at a broader technological framework.”*

**Jhonatan Valenzuela, second lieutenant, Bomberos de Bogota**



# Conclusion

With support from the Government of Belgium, UNGRD and ADP, WFP trained 58 representatives from 19 national and international organizations in Colombia on the use of drones for humanitarian and development projects. The key objective was to teach the participants about practical applications of this technology and give them maximum flight time with different UAS, but also to raise awareness on a number of issues—from coordination to safe data handling.

Due to the comprehensive structure of the course (practical and theoretical sessions), but also diversity of the UAS used (fixed-wings and multi-rotor systems), a wide range of local organizations benefited from the three modules —Let's COORDINATE, Let's FLY and Let's MAP. Participants learnt the full spectrum of drone operations—from coordination, through flight planning and execution to post-processing the raw data. The discussion on practical applications were particularly useful, providing insights into the possible use of drones for rapid assessment, situation monitoring, mapping, public information but also payload delivery.

The training in Bogota was unique, in bringing the number and variety of actors to the table, many of whom are already using or planning to use drones in their operations. Gathering national actors from the government, humanitarian and academic sectors was

the first step into a coordinated use of this technology in Colombia.





# Annex

## Training Agenda

SESSION	TIME	FACILITATOR(S)
<b>Tuesday, 20 November (Let's COORDINATE)</b>		
Opening & Introductions	2 h	WFP
Introduction to UAS Coordination	1 h	WFP UAS Team
Protocols for Use of Drones in Emergencies	2 h	Bomberos de Bogota
Case Studies of Use of Drones in Colombia	2 h	APD
Wrap-up of Day 1	1 h	WFP UAS Team
<b>Wednesday, 21 November (Let's COORDINATE)</b>		
Summary of Day 1	1 h	WFP UAS Team
Coordination of Emergency Response in Colombia	1 h	WFP
International Coordination—Recommendations and Case Studies	1 h	WFP
Regulations for the Use of RPAS in Colombia	1 h	CAA
Group Work: Development of Coordination Protocols	2 h	WFP
Wrap-up of Day 2	1 h	WFP UAS Team
<b>Thursday, 22 November (Let's COORDINATE)</b>		
Summary of Day 2	1 h	WFP UAS Team
Regulations for the Use of RPAS in Colombia	2 h	CAA
Cases of Use of RPAS: Agriculture and Adaptation to Climate Change	2 h	CAA
Group Work: Coordination and Deployment of Drones in Emergencies	2 h	WFP
Wrap-up of Day 3	1 h	WFP UAS Team
<b>Friday, 23 November (Let's COORDINATE)</b>		
Safety Instructions	1 h	WFP UAS Team
Simulation Exercise	3 h	WFP UAS Team
Evaluation of the Exercise	2 h	WFP UAS Team
<b>Tuesday, 27 November (Let's FLY)</b>		
Practical Applications and Hands on Flight (Multi-rotor systems)	8 h	WFP UAS Team
<b>Wednesday, 28 November (Let's FLY)</b>		
Hands on Flight for Participants (Multi-rotor systems)	8 h	WFP UAS Team

SESSION	TIME	FACILITATOR(S)
<b>Thursday, 29 November (Let's MAP)</b>		
Applications of UAS: Practical Mapping exercises	6 h	WFP UAS Team
Hands on Flight for Participants (Multi-rotor systems)	2 h	WFP UAS Team
<b>Friday, 29 November (Let's MAP)</b>		
Applications of UAS: Practical Mapping exercises	5 h	WFP UAS Team
Hands on Flight for Participants (Multi-rotor systems)	2 h	WFP UAS Team
Simulation of Fixed-Wings UAS	1 h	WFP UAS Team

## Acronyms

<b>APD</b>	Asociación de Profesionales de Drones (Professional Drone Association)
<b>CAA</b>	Civil Aviation Authority
<b>ECHO</b>	Humanitarian Aid and Civil Protection
<b>ETC</b>	Emergency Telecommunications Cluster
<b>FAO</b>	Food and Agriculture Organization
<b>IDIGER</b>	<i>Instituto Distrital de Gestión de Riesgos y Cambio Climático</i> (District Institute for Risk Management and Climate Change)
<b>IGAC</b>	<i>Instituto Geográfico Agustín Codazzi</i> (Geographic Institute Agustín Codazzi)
<b>NGO</b>	non-governmental organization
<b>RPAS</b>	Remotely Piloted Aircraft System
<b>UNGRD</b>	<i>Unidad Nacional para la Gestión del Riesgo de Desastres</i> (National Disaster Management Office of Colombia)
<b>UAS</b>	Unmanned Aircraft Systems
<b>WFP</b>	World Food Programme

## Photo Credit

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