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Unmanned Aircraft Systems (UAS) Training

Report on the Drone Training in Haiti
(Let's FLY, Let's MAP and Let's COORDINATE)



May 2019

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Introduction

World Food Programme (WFP), as lead of the Emergency Telecommunications Cluster (ETC), organized the Unmanned Aircraft Systems (UAS) training in Haiti, in May 2019. The training was held ahead of the hurricane season to prepare local organizations for future emergencies and to demonstrate the potential of the drone technology in the country.

55 participants from 16 organizations attended the training throughout the two weeks. The first part of the training, Let's FLY, was conducted in Montrouis, at the Arcadins Coast. 45 participants learnt how to operate drones for mapping and assessment. The theoretical sessions: Let's COORDINATE (on the technology, use cases as well best practices for collaboration) and Let's MAP (using various software to turn drone images into maps) were attended by 30 participants in Port-au-Prince.

Let's COORDINATE covered a wide range of topics related to drones—from the technology itself through coordination of actors and airspace, to specific use cases for humanitarian and development purposes. In Let's FLY the participants received around ten hours of flight practice while in Let's MAP, they learnt different software to process the captured data into detailed maps and digital elevation models.

This report outlines key figures and achievements as well as a way forward.

This training was organized and supported by:



Belgium
partner in development





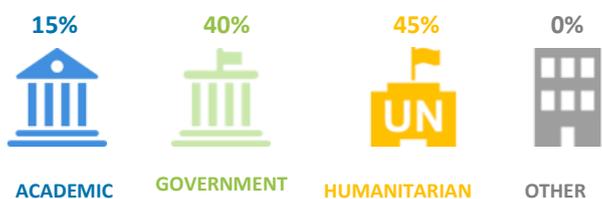
Training Overview

In the second half of May 2019, WFP, supported by the Government of Belgium and local organizations including Haiti's Civil Protection (DPC), conducted the full UAS training package in Haiti. Local organizations from academic, government and humanitarian agencies attended this two-week learning event.



- ACF—Action contre la Faim (Action Against Hunger);
- CNIGS—Centre National de l'Information Géo-Spatiale (National GIS Centre);
- DPC—Direction de la Protection Civile (Civil Protection);
- FAO—Food and Agriculture Organization;
- IOM—International Organization for Migration;
- OCHA—United Nations Office for the Coordination of Humanitarian Affairs;
- OFNAC—Office National de l'Aviation Civile (Civil Aviation Authority [CAA]);
- PADF—Pan American Development Foundation;
- UEH—University of Haiti;
- UHM— Unité HydroMétéorologique d'Haïti (Meteorological Institute of Haiti);
- UNDP—United Nations Development Programme;
- UNFPA— United Nations Population Fund;
- UNICEF—United Nations Children's Fund;
- UNOPS—United Nations Office for Project Services;
- USAID—US Agency for International Development;
- WFP (including IT, Programme and VAM).

Breakdown of organizations:



The

full UAS training consists of three modules:

LET'S COORDINATE



LET'S FLY



LET'S MAP



During Let's COORDINATE, the participants received a full overview of the developments of the UAS coordination model, WFP's work in the areas of solution localization as well as case studies on support to programmes, especially in the Latin American region and the recent emergency response in Mozambique.

Theoretical sessions

The facilitators delivered theoretical sessions on:

- Overview of UAS coordination;
- Case studies and lessons-learned;
- Safety procedures;
- Data privacy and protection.

Technology used for practical sessions:



**SPARK
MAVIC PRO**

During Let's FLY the participants received a hands-on training on the drone technology, including detailed introduction to mobile applications that enable the handling of drones. They gained approximately ten hours of actual flight time.



“This training is an added value for us (...) we will try to integrate drones further after natural catastrophes and disasters for the activities of in order to have the assessments much more quickly.”

Berla Severin, Head of Department at DPC

Survey results (general)

- Overwhelming majority of participants (97 per cent) found the training met their expectations. 97 per cent agreed that the training had a good amount of content and 100% enjoyed the variety of delivery methods which included practical exercises, expert presentations, case studies and group work.
- Participants particularly praised professionalism and knowledge of the trainers, as well as practical exercises on flying and mapping.
- It was suggested to share the documents and manuals (in French) beforehand. Ideally the participants would like more group work and a follow-up training to gain more flight time.

- The participants considered mapping (including creation of 3D models) and application for post-disaster assessment as the biggest learning for their respective organizations.

Survey results (Let’s COORDINATE):

- Among the biggest learning the participants named: applications for monitoring, search and rescue as well as post-disaster assessments and emergency response. Additionally, overview of regulations, and groupwork on Concept of Operations (CONOPS) were listed.
- Suggestions for improvements included: sharing the presentations and technical aspects ahead of the training; adding more flight practice time and presenting more case studies (incl. videos).

Feedback on Let’s FLY and Let’s MAP

“I’ve had the experience to use the drone to [support] the installation of a solar panel system (...) I can already see potential for my colleagues who work as field monitors—to collect data or to make assessment of sites or even before implementing a project to determine whether it is viable with the quality of the information we can have with the drones.”

Pour Ronald Fevry, Information Analyst at UNDP



Training Details



“Drones are the future of search and rescue operations - they can deploy rapidly, cover large search areas and deliver first aid kits in hard-to-access areas.”

Charles-Alain Beauvoir, SALSAT controller, OFNAC

UAS coordination

WFP has been developing the use of UAS in humanitarian sphere since 2017, including the coordination model, capacity building and support to WFP programmes and operations. This work with practical examples from several countries was presented during Let's COORDINATE. As WFP is looking at various aspects related to UAS—from air safety to data protection, the participants received a comprehensive overview of drones' capacity, challenges and practical applications.

Case study: drones in emergency response

One of the real-life scenarios presented to the group was the use of drones in the emergency response to Cyclones Idai and Kenneth in Mozambique. The UAS services were deployed for the first time as a common service, which included deconfliction of airspace, coordination with the government and humanitarian agencies as well as provision of services in

the area of assessment (search & rescue and mapping). Drone pilots who responded in Mozambique talked about their experience and lessons-learnt, giving the participants practical tips.

Group work outcomes

The participants were particularly interested in application of drones in Haiti. In the practical session, the groups developed concepts of operations (CONOPS) for various scenarios, including pre-disaster (emergency preparedness) as well as post-disaster for damage assessment after landslides, earthquakes etc.).

One of the scenarios was to assess the quality of national road No 3, which is key for access to many important sites (map below). Recently a landslide was recorded along a section of that road, close to a hydro-electric dam, which could cause serious threat to population living near by.

"(...) drones can allow us to count people and identify the number of houses with great precision. The drones do a lot more than just take pictures."

John Charles, Analyst, Information and Communication Technologies (ICT) with the United Nations Population Fund (UNFPA)



Each team came up with a concrete action plan, resources (both equipment and personnel) to respond to the scenarios (landslides, flooding, earthquake).

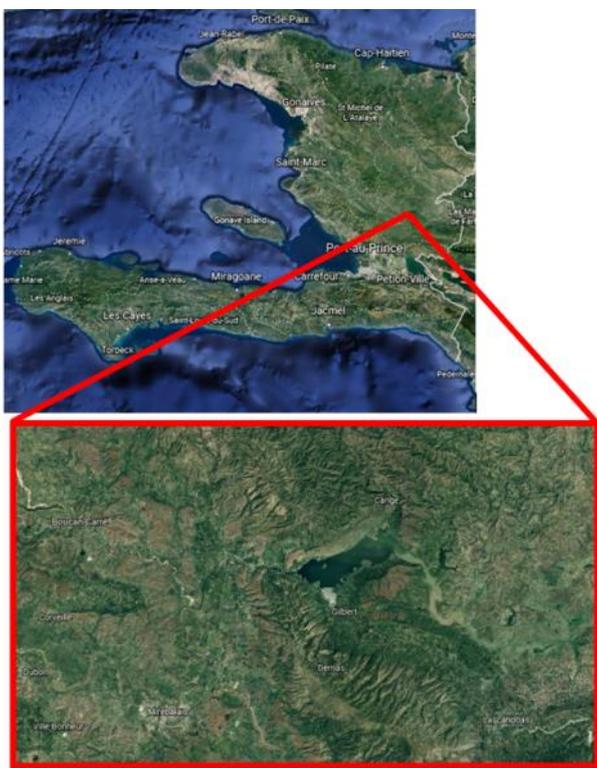
Guest presentations

United Nations Development Programme (UNDP) presented its use of drones for the planning and monitoring of its solar panel

practice during Let’s COORDINATE. They learnt to operate multi-rotor systems— starting with a small Spark for practice and then progressing to Mavic Pro, suitable for mapping operations. The objective of the course was to gain confidence on operating the drones for photo/videography and mapping operations, troubleshooting basic problems as well as learning all the associated mobile applications which allow for automation of the process. The instructors also explained mapping missions with using software available for download online: Pix4D Capture, DJI Pilot and DJI Ground Station.

Next steps

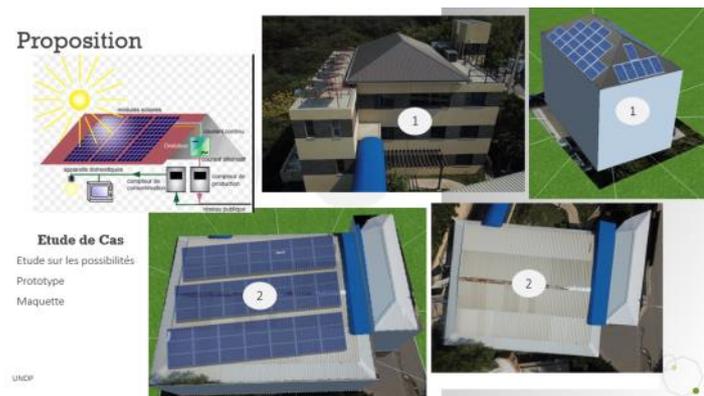
- WFP Drones team will continue engaging with the Country Office on their needs and support in case of follow-on programme activities.
- The participants were particularly interested in an advanced flight training (such training was conducted in September 2018 for Madagascar and Mozambique allowing South-South collaboration).
- All training materials will be shared with the participants.



installation project.

Practical flight sessions

During two weeks of the UAS training, the participants received around ten hours of flight time during Let’s FLY, but also extra



Conclusion

In conclusion, Haiti, due to the significant hazards faced on a regular cadence as noted over the past decade, has an opportunity to leverage UAS technology to more effectively and efficiently reach affected communities in times of need as well as augment traditional monitoring mechanisms in the implementation of humanitarian assistance and development activities.

The regulatory environment in Haiti is supportive of the inclusion of drones into the national airspace and attendees of the training from OFNAC demonstrated a strategic understanding of UAS and the capability to support programmes within the country. Due to its mandate as both the Civil Aviation Authority as well as the Air Navigation Safety Provider the agency is well positioned and interested in the engagement in the UAS space. Effective future operations should include OFNAC representatives to ensure continuity and compliance as regulations are being developed.

As a result of the training activities it became clear that there is a programmatic need for technology to better assist humanitarian decision makers. The multi-sectoral participants were able to identify significant areas where their ongoing activities could be augmented the technology to aid in efficiency and yield more precise outcomes.

The recommended way forward would be the launching of a

UAS common service to cross-cutting thematic areas that may need the technology. Given the volume of potential work at a regular basis a dedicate pool of drone assets and operators would allow for the technology to be deploy in an on demand as required basis.



Annex

Training Agenda

SESSION	TIME	FACILITATOR(S)
Tuesday, 21 May 2019 (Let's FLY)		
Opening & Introductions	1h	WFP
Practical Applications and Hands on Flight (Multi-rotor systems)	6h	WFP UAS Team, Help.NGO
Wednesday, 22 May 2019 (Let's FLY)		
Introduction to flight operations and applications	1 h	WFP UAS Team, Help.NGO
Practical Applications and Hands on Flight (Multi-rotor systems)	6h	WFP UAS Team, Help.NGO
Thursday, 23 May 2019 (Let's MAP)		
Introduction to Drone Imagery and Mapping	1 h	WFP UAS Team
Introduction to the Mapping Software	1 h	Help.NGO
Practical Mapping Exercises: Data Processing and Verification	5 h	Help.NGO
Friday, 24 May 2019 (Let's MAP)		
Standards for Data Processing	1h	Help.NGO
Practical Mapping Exercises: Data Processing and Verification	6 h	Help.NGO
Tuesday, 28 May 2019 (Let's COORDINATE)		
UAS Coordination	1h	WFP UAS
Case Study: Disaster Response in Mozambique	1h	Help.NGO
Overview on Data Protection and Privacy	1h	WFP UAS
Case study: UNDP Drone Operations	1h	UNDP
Concept of Operations (CONOPS) – Overview	2h	WFP UAS, Help.NGO
Wednesday, 29 May 2019 (Let's COORDINATE)		
Planning Field Operations	1h	WFP UAS, Help.NGO
Emergency Response in Haiti	1h	DPC
Civil Aviation Authorities: Regulations and Use of Drones in Haiti	1h	OFNAC
Group work: CONOPS	2h	WFP UAS, Help.NGO
Case Study: IOM	1h	Representative
Thursday, 30 May 2019 (Let's COORDINATE)		
Flight and mapping operations practice	6h	WFP UAS, Help.NGO
Friday, 31 May 2019 (Let's COORDINATE)		
Case Study: Disaster Risk Mitigation (Mangroves)	1h	Help.NGO
Groupwork: Concept of Operations (CONOPS)	4h	WFP UAS
Drones for Advocacy and Communication	1h	WFP

Acronyms

ACF	<i>Action contre la Faim</i> (Action Against Hunger);
CAA	Civil Aviation Authority
CNIGS	<i>Centre National de l'Information Géo-Spatiale</i> (National GIS Centre)
CONOPS	concepts of operations
DPC	<i>Direction de la Protection Civile</i> (Civil Protection);
ETC	Emergency Telecommunications Cluster
FAO	Food and Agriculture Organization
IOM	International Organization for Migration
NGO	non-governmental organization
OCHA	Office for the Coordination of Humanitarian Affairs
OFNAC	<i>Office National de l'Aviation Civile</i> (Civil Aviation Authority [CAA]);
PADF	Pan American Development Foundation
SDG	Sustainable Development Goals
UAS	unmanned aircraft systems
UEH	University of Haiti
UHM	<i>Unité HydroMétéorologique d'Haïti</i> (Meteorological Institute of Haiti)
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNOPS	United Nations Office for Project Services
USAID	US Agency for International Development
WFP	World Food Programme
WHO	World Health Organization

Photo Credit

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