



Photo: WFP / Mariko Hall

# How Modern Technologies (drones, big data and AI) have Revolutionised Approaches to Disaster Management, Resilience and Response?

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Photo: ISF

# WORLD FOOD PROGRAMME

Assisting 80 million people in around 80 countries each year, the World Food Programme (WFP) is the leading humanitarian organization saving lives and changing lives, delivering food assistance in emergencies and working with communities to improve nutrition and build resilience.

Two-thirds of our work is in conflict-affected countries where people are three times more likely to be undernourished than those living in countries without conflict.

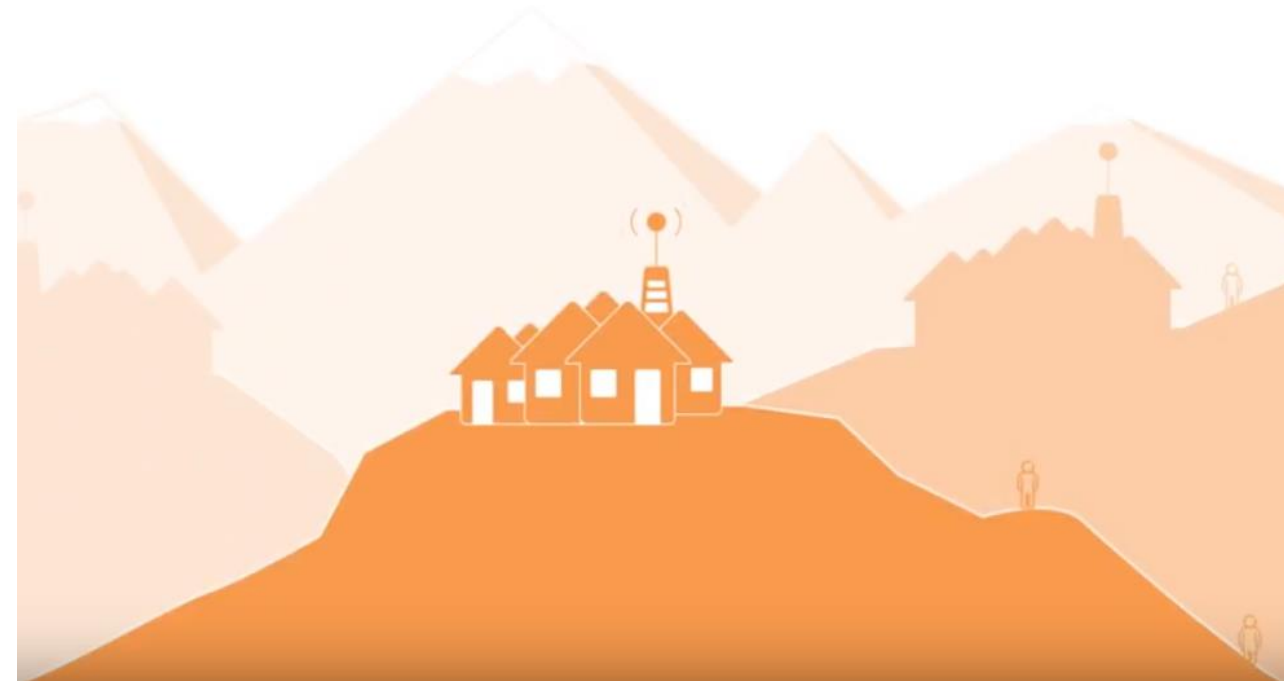


# Emergency Telecommunications Cluster



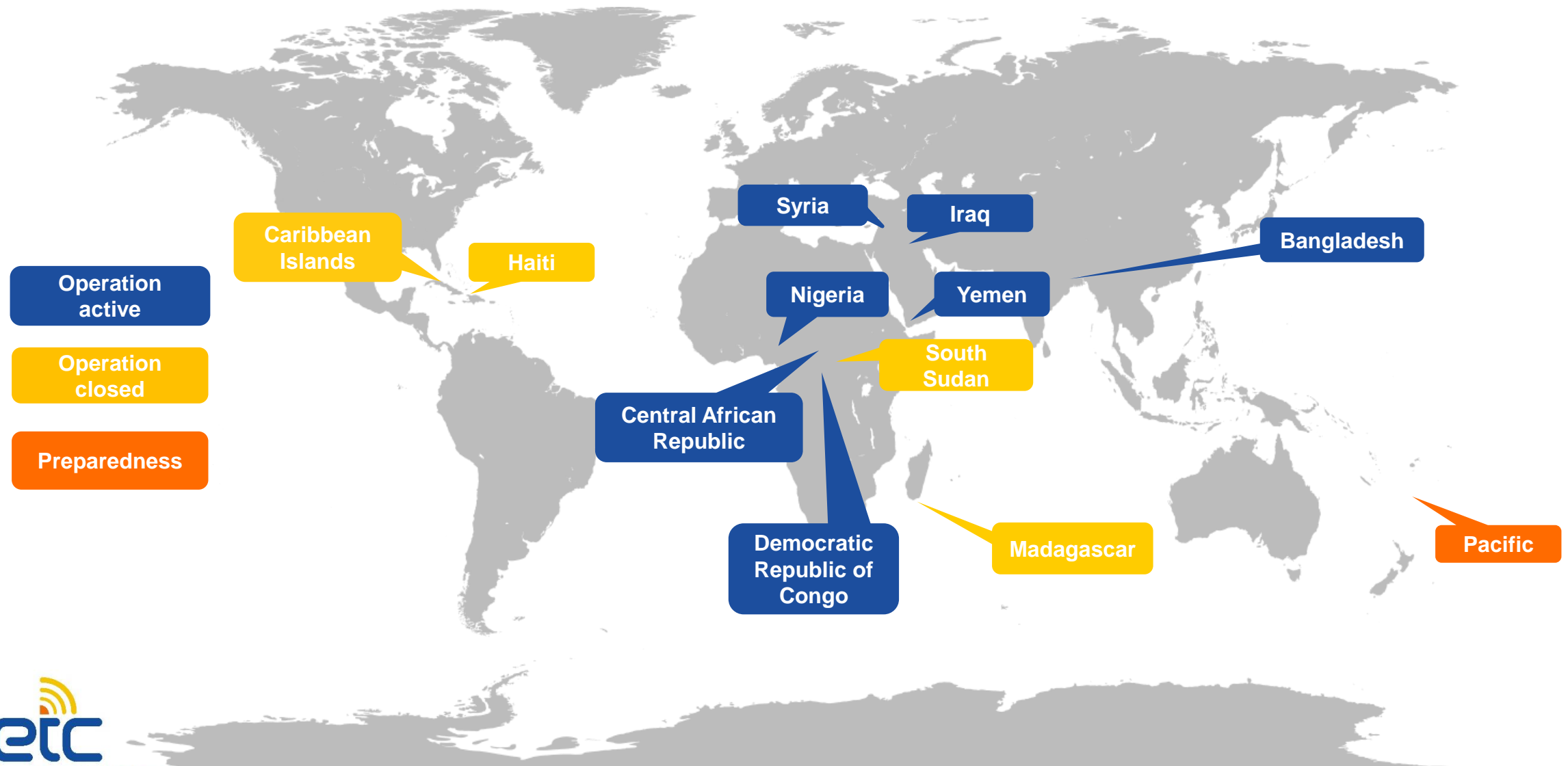
# Who we are

The ETC is a global network of humanitarian,  
government and private sector organisations  
working together to provide shared communications  
services in humanitarian emergencies.





# Where we worked in 2017



# ETC Services



**SECURITY  
COMMUNICATIONS**  
Through VHF radio



**TECHNICAL  
HELP DESK**  
For users



**PREPAREDNESS**



**INTERNET  
CONNECTIVITY**  
Through quick-deploy  
satellite terminals and  
Wi-Fi hotspots



**COORDINATION  
AND INFORMATION  
MANAGEMENT**  
Including liaison with  
government authorities.



**SERVICES FOR  
COMMUNITIES (S4C)**



**DRONE  
COORDINATION**



IN HUMANITARIAN EMERGENCIES,  
COMMUNICATIONS MEANS  
**INFORMATION,  
CONNECTION,  
LIFE.**

Photo: Office for the Coordination of Humanitarian Affairs (OCHA).

# Drones Shapes and Sizes





# Emergency Response

Emergency Coordinators need to make rapid decision often with limited information.



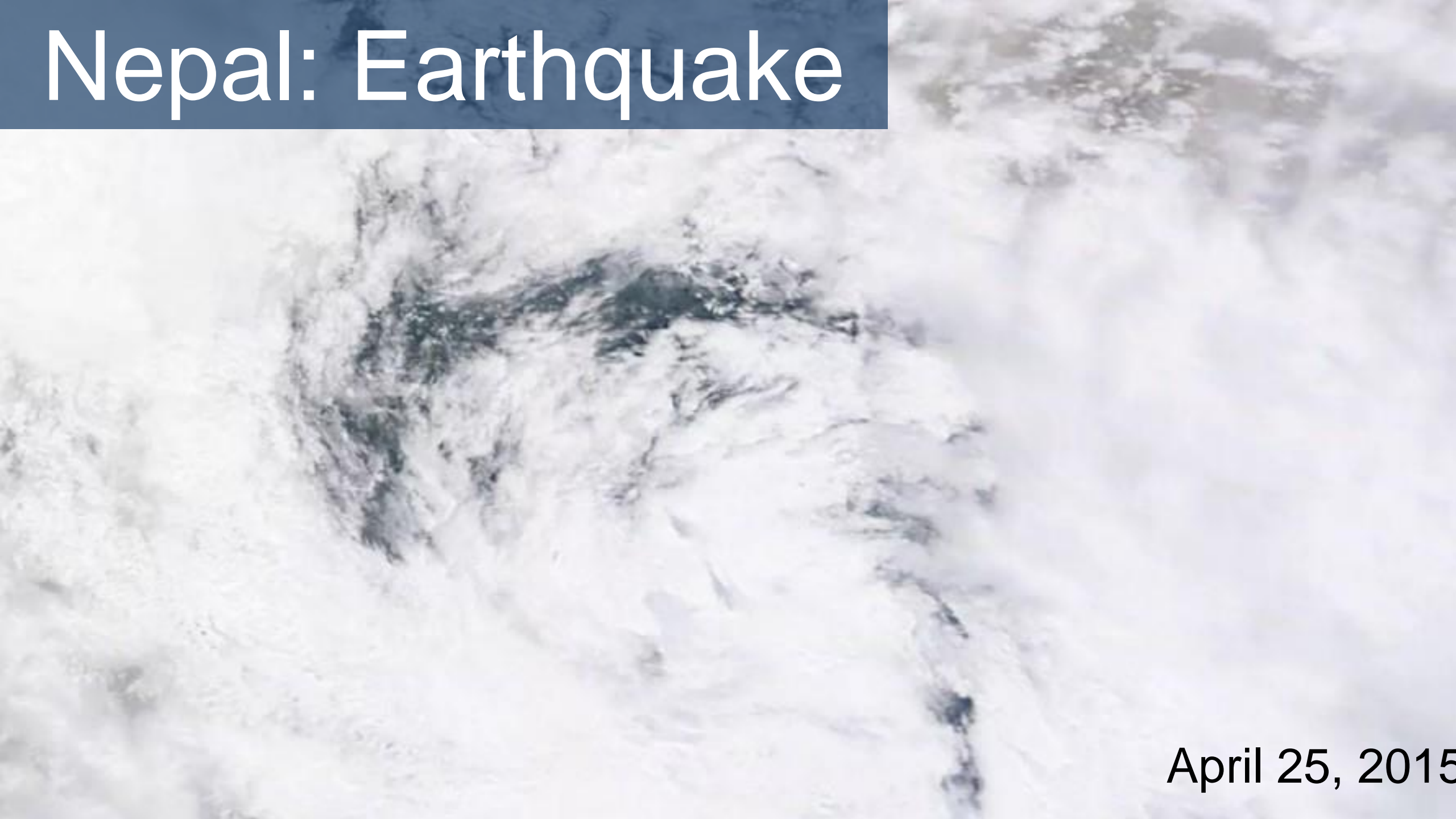


# Emergency Response

Drones provide a platform to rapidly collect remotely sensed image data at high resolution.



# Nepal: Earthquake



April 25, 2015











# Mapping Drone

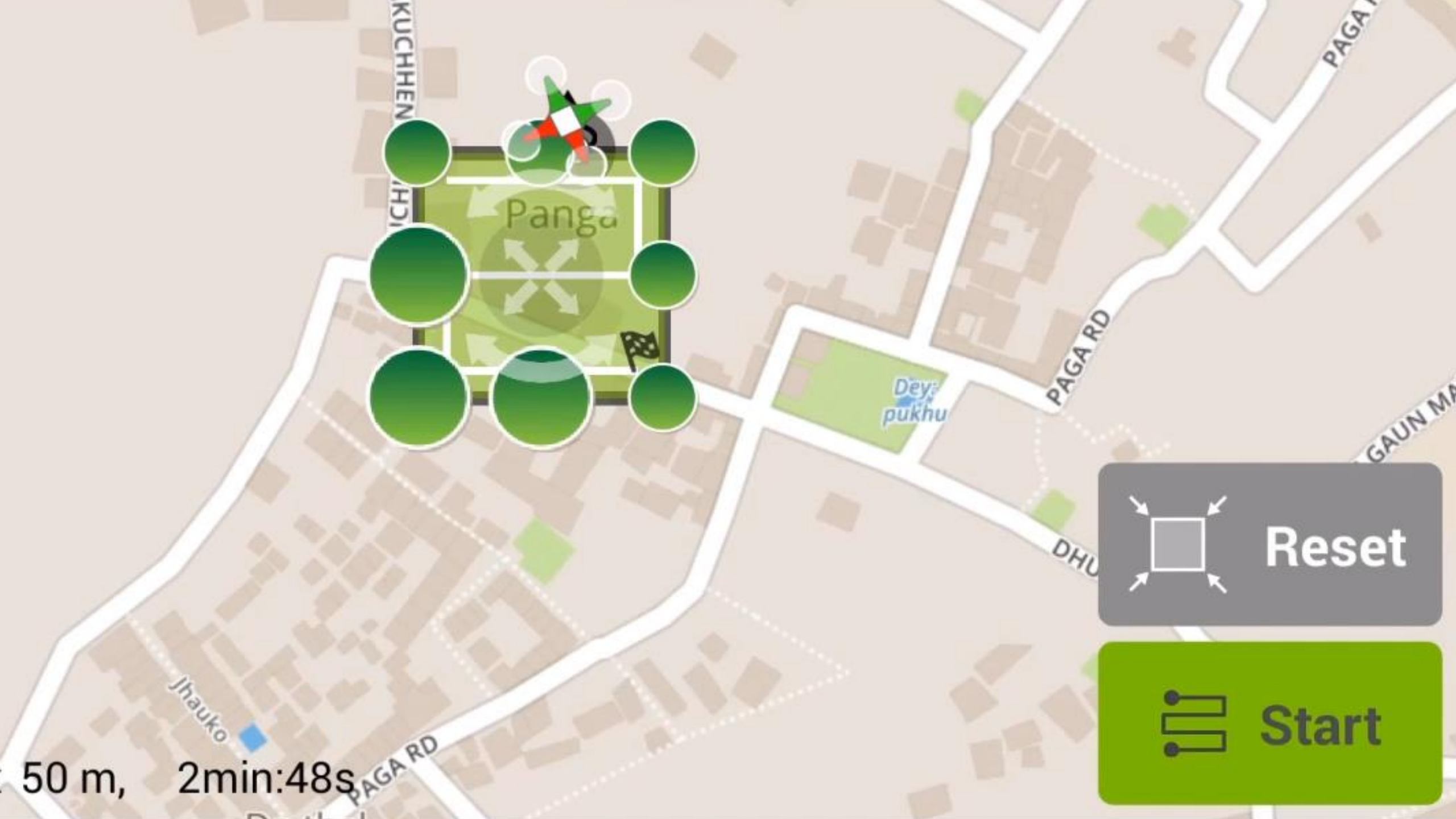
Weight <750g

Flight time: <40 min

Area coverage of 1-3km<sup>2</sup>

Resolutions: 2.5 -20 cm





 **Reset**

 **Start**

50 m, 2min:48s



# The Drone Market Environment 2016





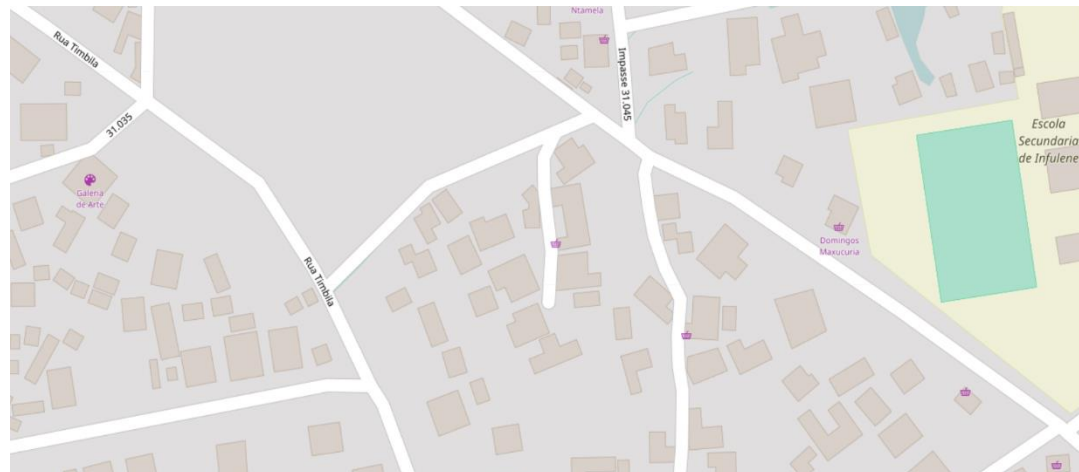
# Maps comparisons



**Drone**



**Google Earth**



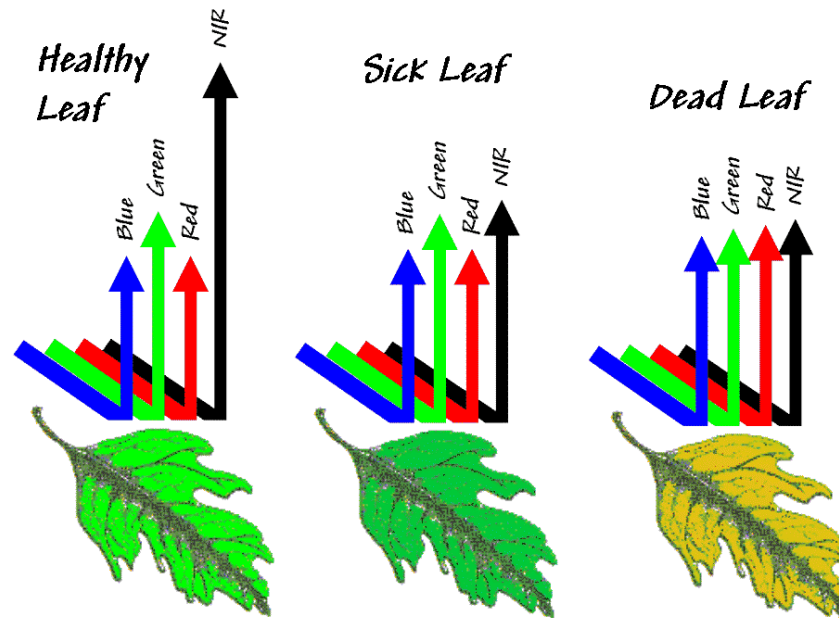
**OpenStreetMap**



# Vegetation monitoring and crop stress detection

Normalized Difference Vegetation Index (**NDVI**) values give an indication of crop stress...

Reveals status of the crop about 10 days earlier than what can be seen by the human eye.





# What the human eye sees



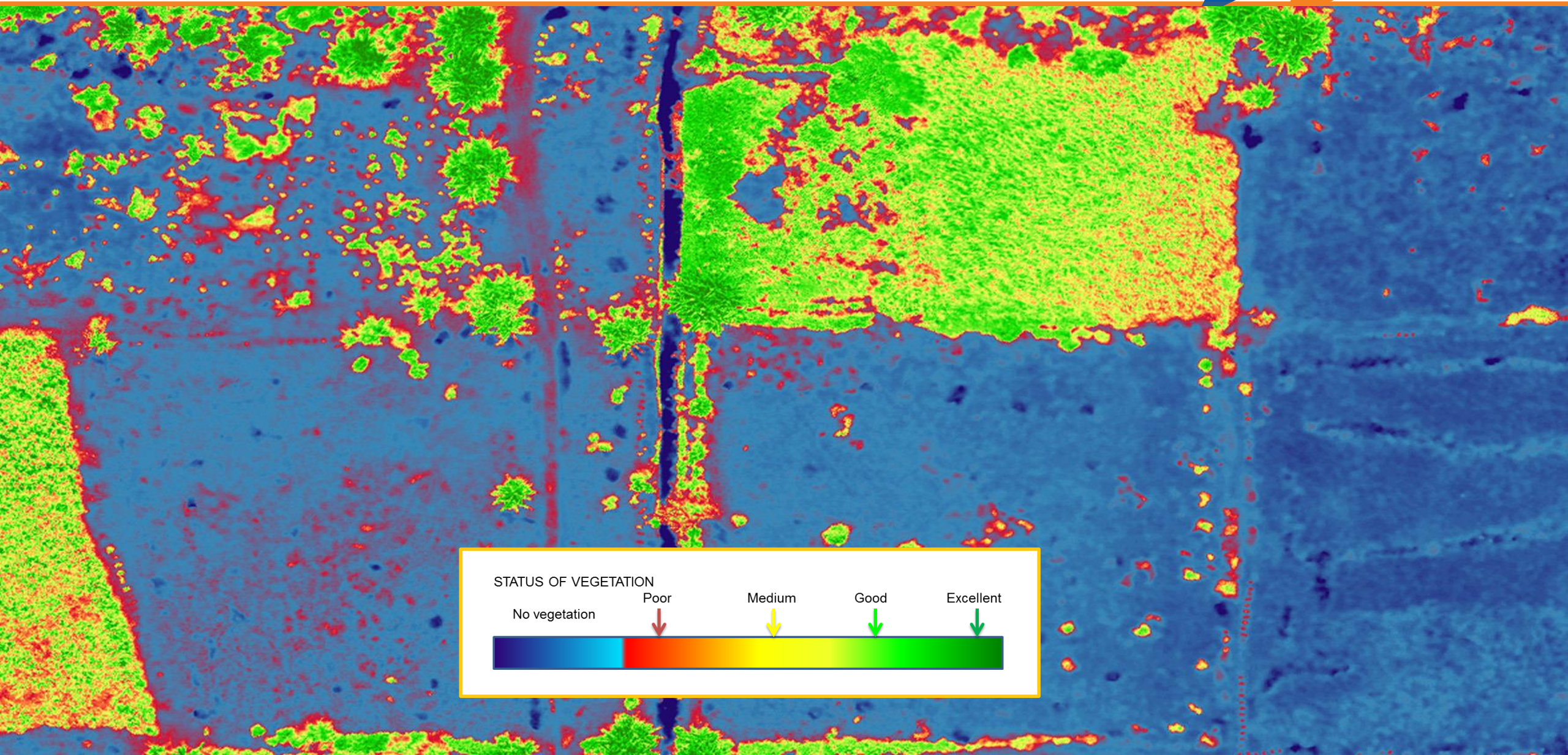


# What the NIR image shows



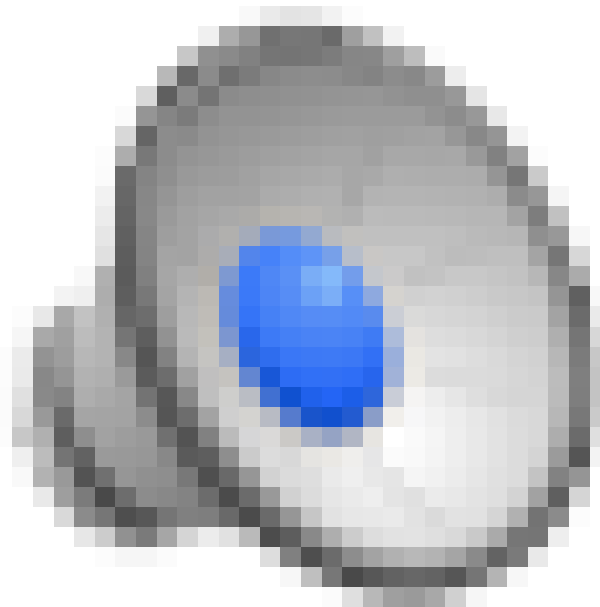


# What the NDVI shows





# Disaster Risk Reduction and Recovery Mapping in Tajikistan (3D Modeling)

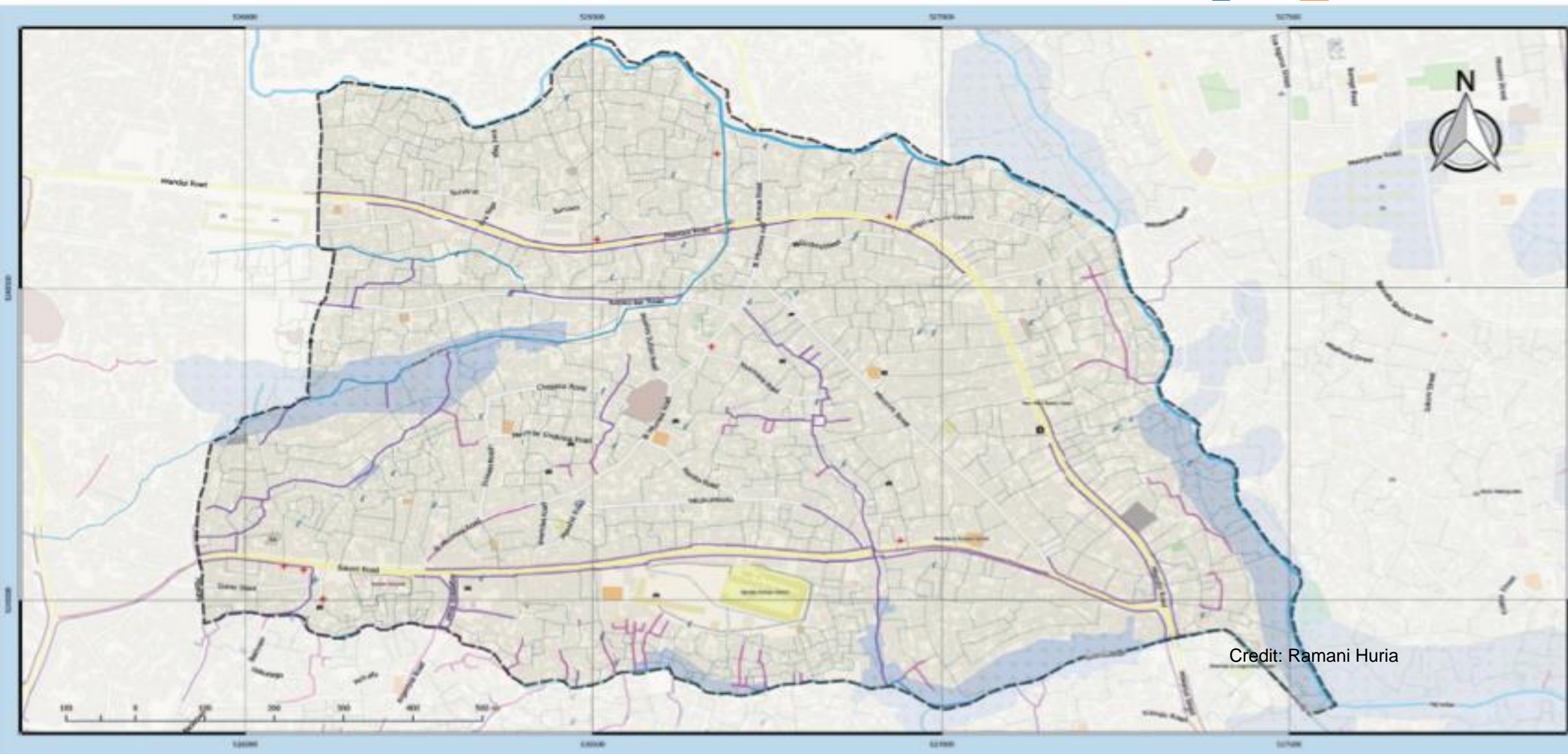


# Tanzania: Flood Risk Management





# Digitized maps based on drone imagery were used for Urban Planning



# Cell On Wings

Currently deployed with AT&T, US MNO

Roaming 6 GSM Networks

40 Sq Miles Coverage

Further than COWs





# AI and Machine learning

An experienced remote sensing analyst normally achieves image analysis through visual interpretation.

One 20 minute flight, can take up to half a day to analyse!





# AI and Machine learning

That requires  
machine learning  
software to rapidly  
assess UAV imagery  
(Big Data)





# AI and Machine learning



Faster decision making



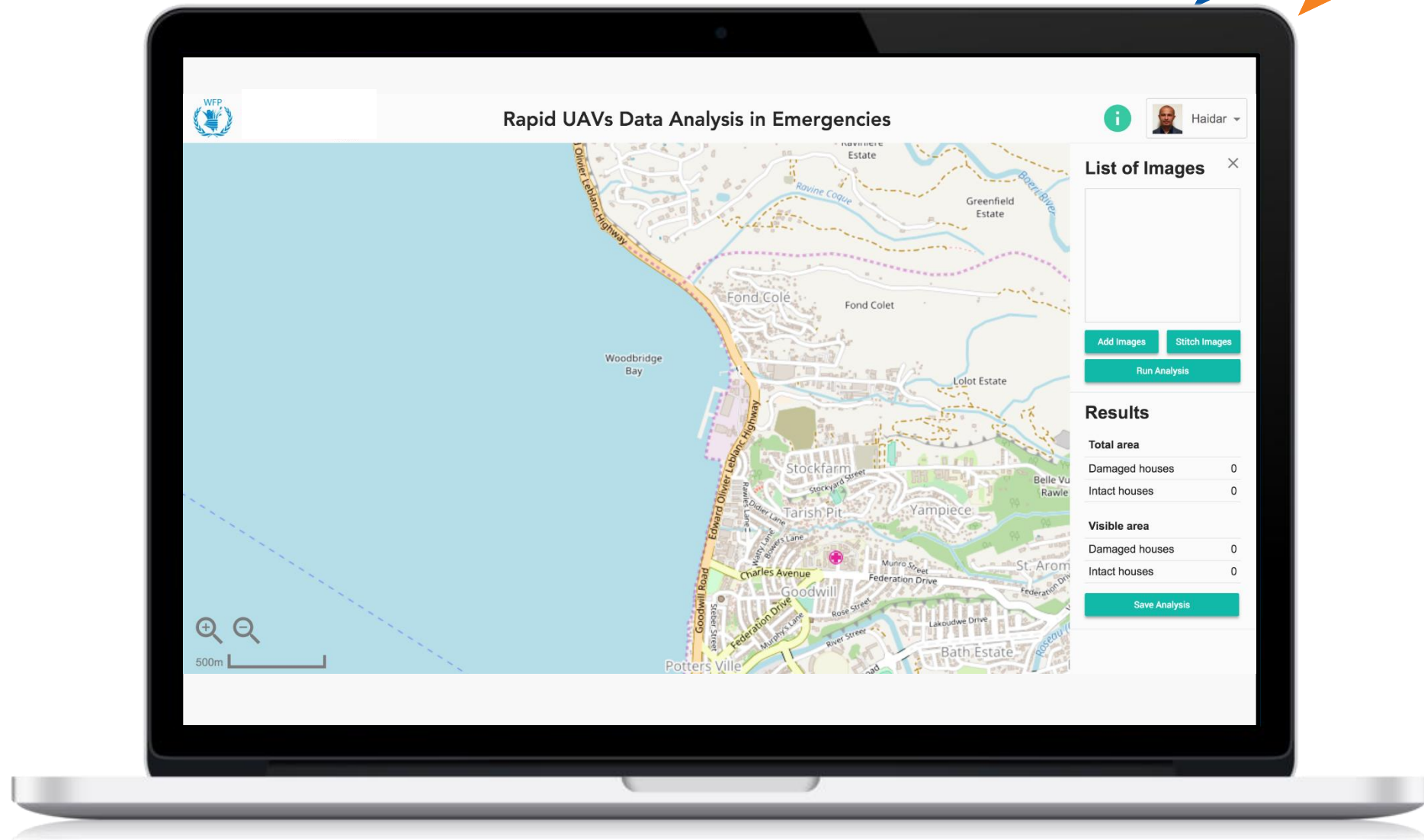
More informed process



Improved targeted assistance

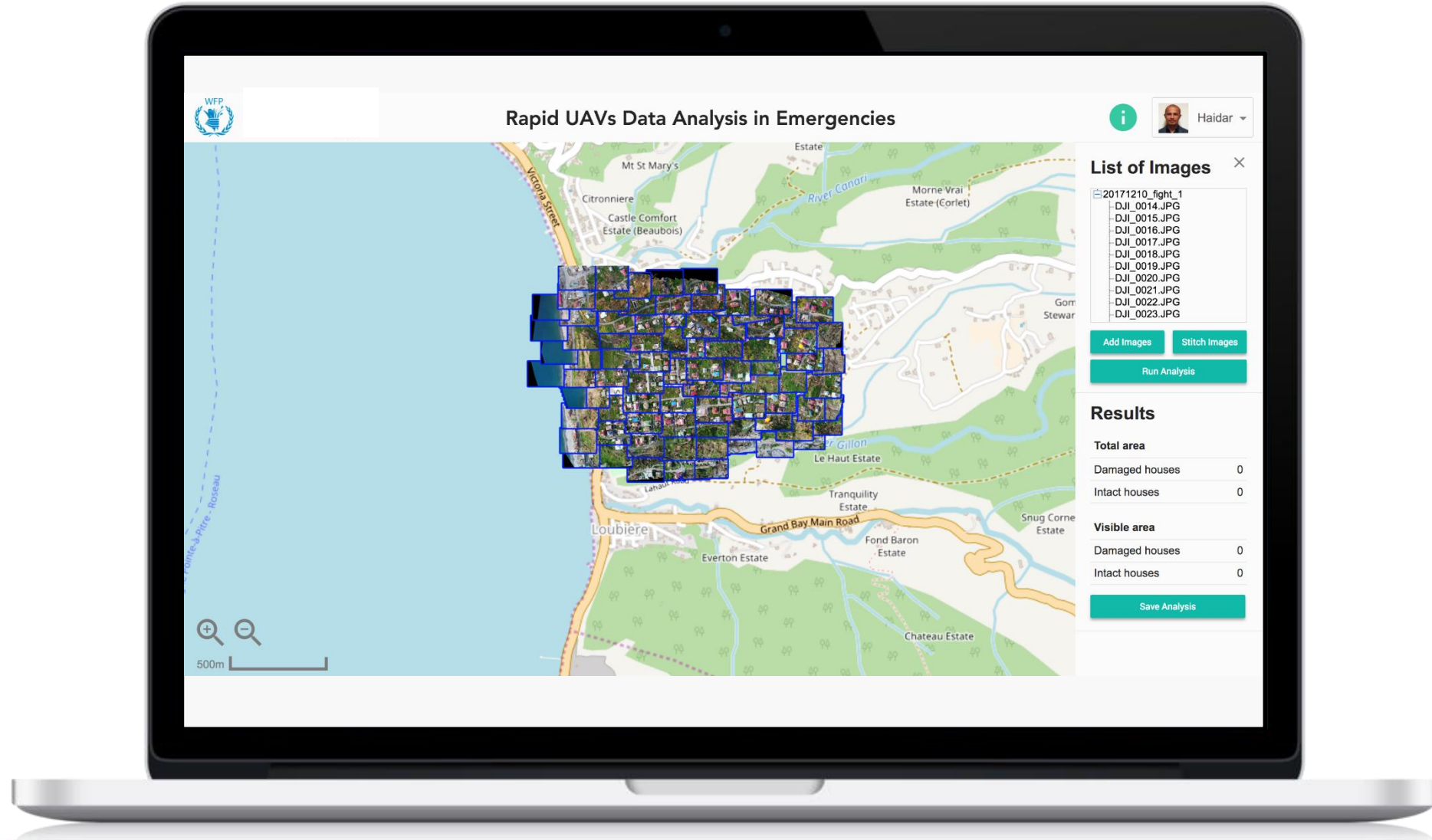


# AI and Machine learning

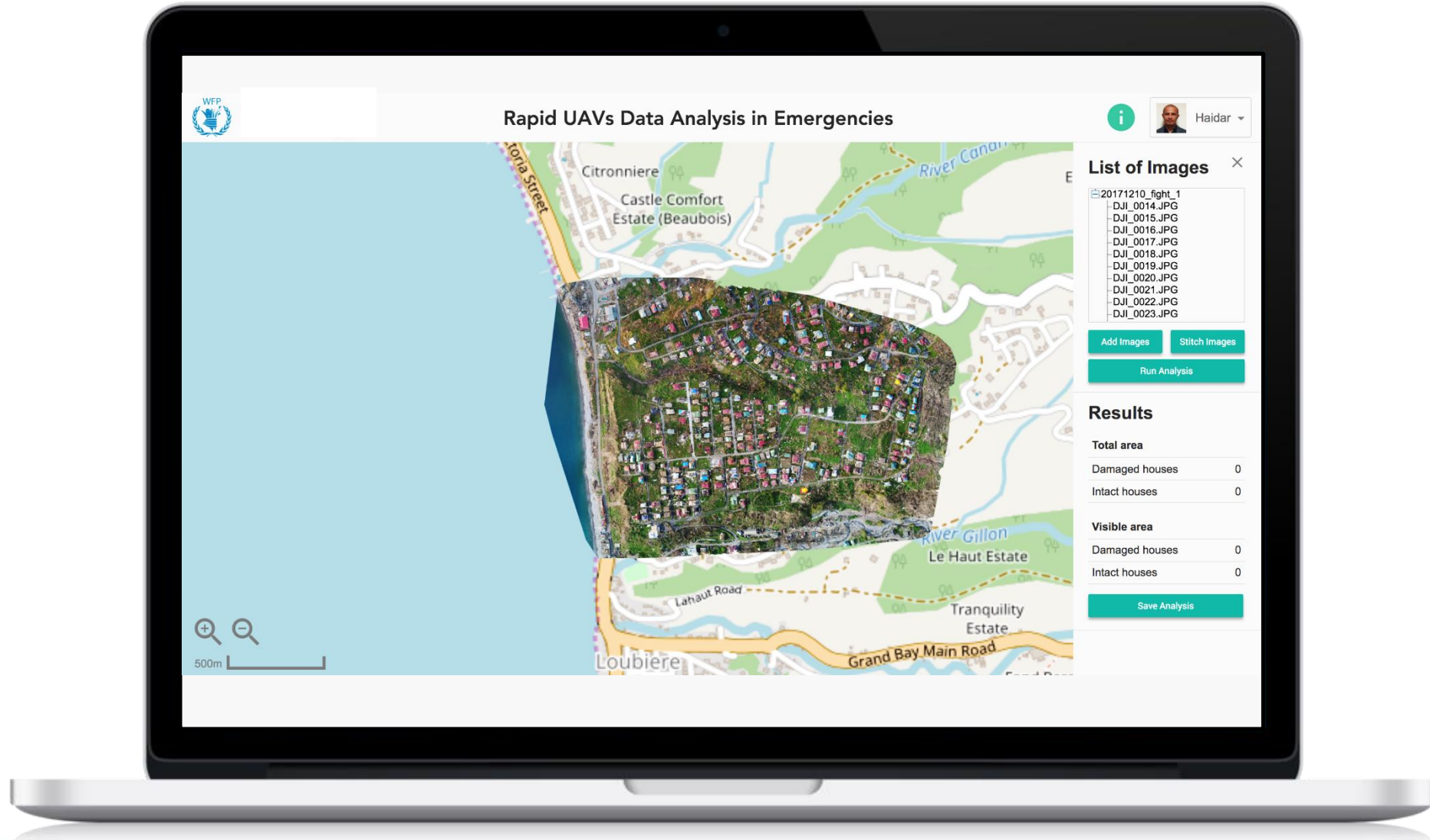




# AI and Machine learning

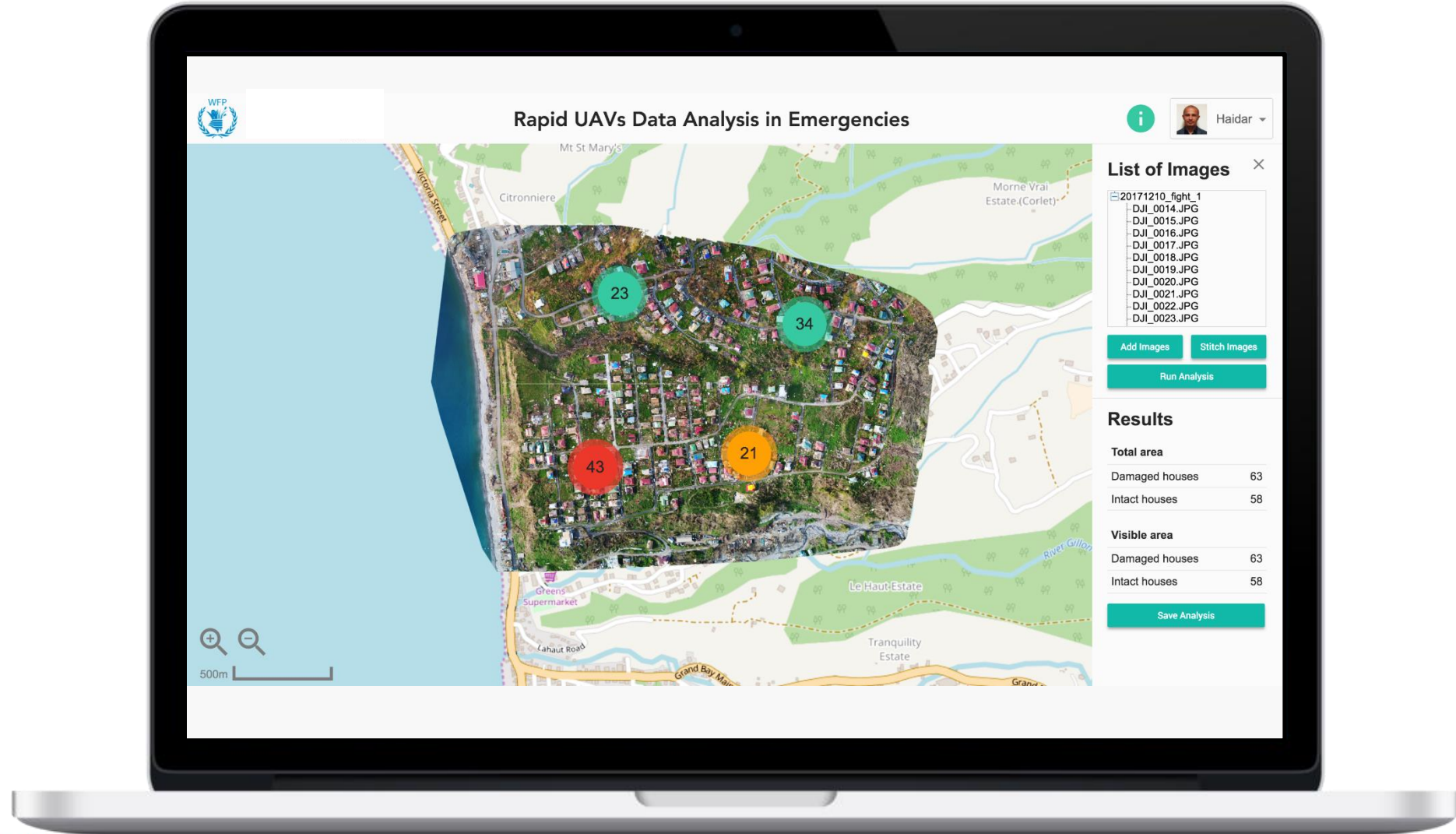


# AI and Machine learning





# AI and Machine learning



# AI and Machine learning







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# The Future Is Now!

(Lets Plan, Coordinate, and Fly)



# Humanitarian drone coordination: It's a lot more than just drones.

What kinds of **metadata** standards will be most useful?

What kinds of **regulations** need to be written?

What kind of **data** needs to be collected?

How do we ensure protection of **privacy**, security and other rights?

What are the best ways to **share** UAV data?

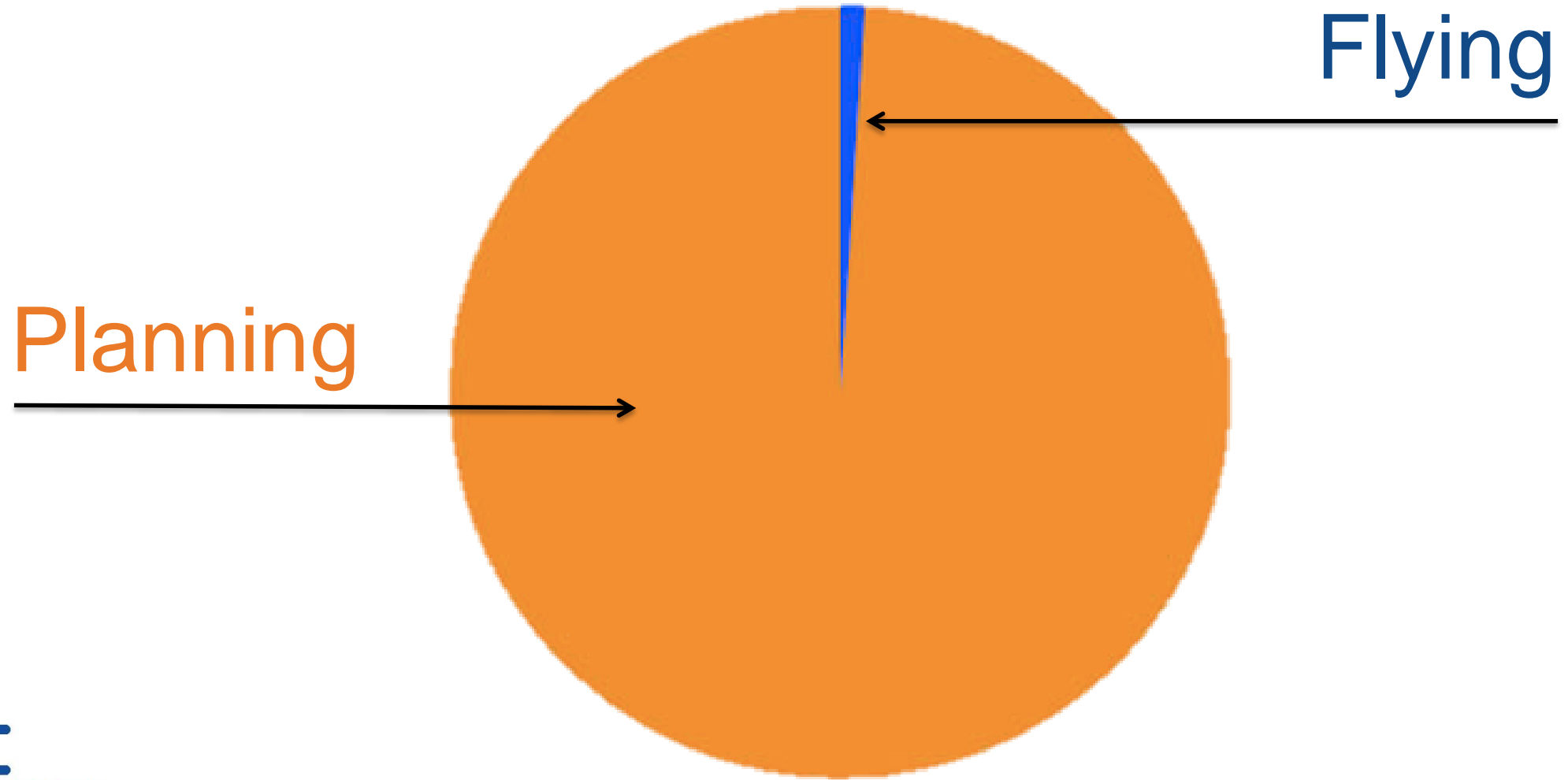
What kinds of information **services** will be most efficient during disasters?

How do **communities** need to be engaged?

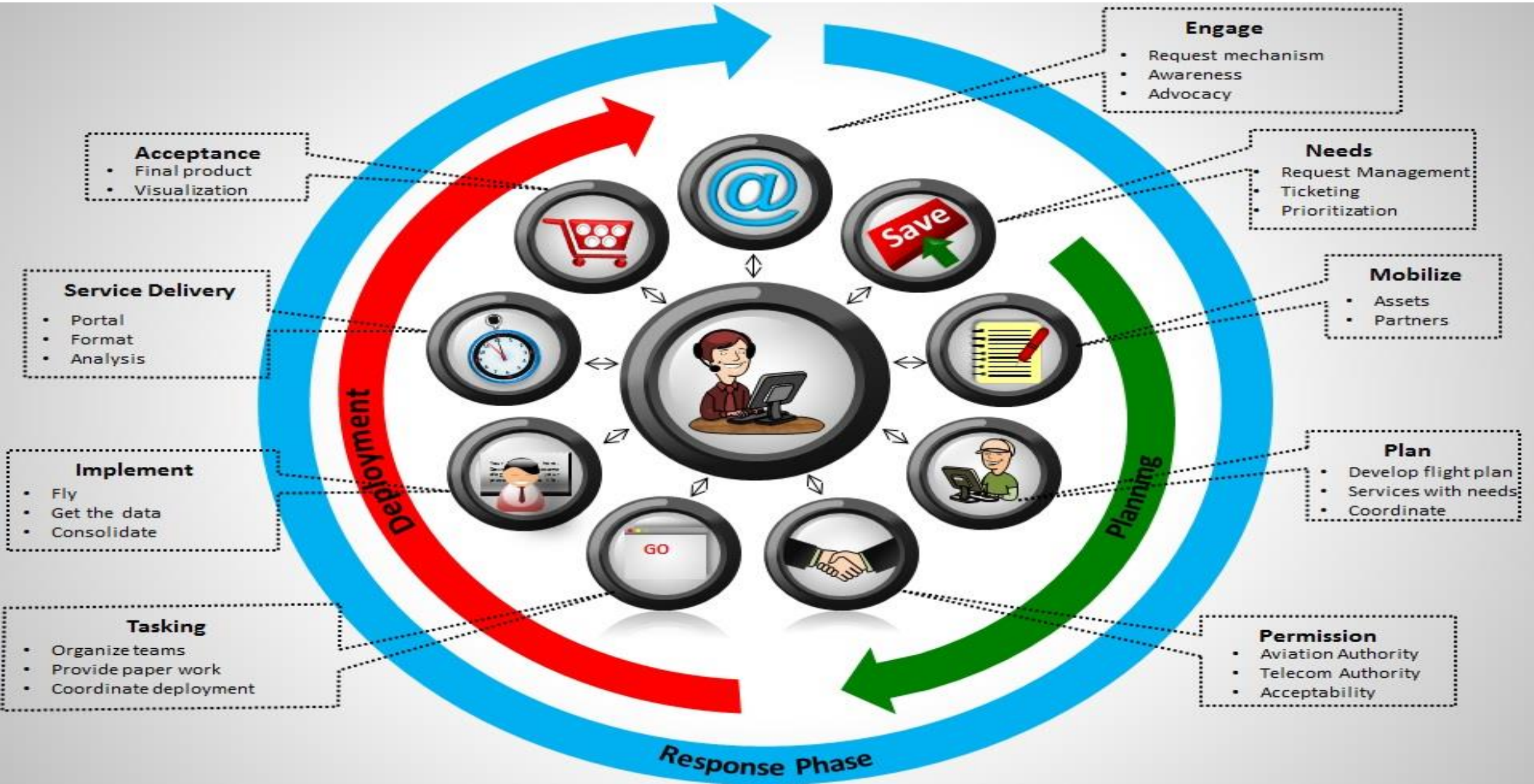




# Humanitarian Drone Missions: How time flies



# UAV Deployment Coordination Model





# The approach



# Impacts





# WFP Drone Activities

Throughout 2017-18, WFP consolidated the inputs from the TWG and conducted workshops and six countries – the Dominican Republic, Mozambique, Myanmar, Peru, Colombia, and Niger.

The workshops provided a clear definition of the coordination model; bringing together relevant stakeholders; identifying improvement areas; defining and evaluating methods to increase local, regional, and national capacity for emergency responses. WFP is planning a series of additional trainings in other high-risk countries.



# QUESTIONS?

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